Hawler Medical University

4th International Scientific Conference

‘Towards Scientific Identification of Mass Graves and Genocide in Kurdistan Region’

Erbil International Hotel

Erbil, Iraqi Kurdistan Region

7-8 November 2018

www.hmu.edu.krd
University President’s Statement

I would like to welcome you to the 4th International Scientific Conference of Hawler Medical University, which is held under the theme of ‘Towards Scientific Identification of Mass Graves and Genocide in the Kurdistan Region.’

Hawler Medical University always works on addressing issues related to health, wellbeing of community, as well as, developing medical education in Kurdistan and Iraq. Every year, we carry out different scientific activities to address these issues. In previous conferences of Hawler Medical University, we tried to address important topics, such as directing scientific research to address the community needs, and promoting the medical education in Kurdistan. In the 4th International Scientific Conference of Hawler Medical University, we will discuss important issues of mass graves and genocide.

In the last few decades, Kurdistan faced many ethnic cleansing and mass attacks that have resulted in the killings of thousands of innocent civilians, as well as, the demolition of thousands of villages and forced displacements of thousands of people. The chemical bombardments of different areas including Halabja and Anfal operations are examples of these inhumane attacks. Unfortunately, all these tragic events and their consequences are not adequately covered in literature, and are addressed in limited research. All of these operations in addition to the recent ISIS attacks and mass killings have produced hundreds of mass graves throughout Kurdistan and Iraq.

Our experience in identifying and exploring mass graves is very recent, and we need to do crucial and sensitive work in a sound scientific method. Therefore, we ought to bring experts from Iraq and abroad and connect them in this conference to present their experiences and discuss best ways and methods for the scientific identification of mass graves, and proper documentation of genocide in Kurdistan. These efforts can help in receiving international recognition of the genocide acts, as well as, assist in preventing such aggressions and inhumane acts against our civilians and nation in the future.

I would like to thank all the speakers and presenters for their valuable contribution to the conference and this important issue. I would also like to thank the conference organizing committees for their hard work while preparing the details of the conference. I wish all the conference participants a successful and fruitful participation, as for those coming from outside Erbil, I wish them a pleasant and joyous stay in the city.

Assistant Professor
Dr. Dara O. Meran
President
Hawler Medical University
dara.meran@hmu.edu.krd
Hawler Medical University at a Glance

Hawler Medical University is a public university located in the city of Erbil (Hawler) in Iraqi Kurdistan Region. Hawler Medical University has been established by the Council of Ministers of the Iraqi Kurdistan Regional Government in July 2005 and endorsed by the Council of Ministers of Iraqi Federal Government in March 2006. The university was established to include in itself the medical group colleges that were belonging to the University of Salahaddin-Erbil.

The university currently includes five colleges; College of Medicine, College of Dentistry, College of Pharmacy, College of Nursing and College of Health Sciences. It has two main campuses located in Erbil city.

The overall aim of establishment of Hawler Medical University was to improve the medical education in the Kurdistan region as well as to have better and more effective management of the mentioned colleges. This does not mean that the colleges were newly established, as the oldest college which is the College of Medicine was founded in 1977. Establishment of a university for medical group colleges was by itself the first experience in Iraq.

Hawler Medical University provides undergraduate and postgraduate studies in different medical and health sciences. The language of study in all the programs is in English. Hawler Medical University is progressing very well to establish itself as a modern and successful center of medical and health education and research with the efforts of committed and talented staff and the support of Iraqi Kurdistan Regional Government. Our success is intended to increase our service to the community in Kurdistan region and Iraq as a whole. Hawler Medical University is intended to be an innovative center of excellence in learning and research while supporting students and researchers committed to assisting the community. The aim is to promote the development of students to reach their true potential in becoming competent, ethical, caring and inquiring doctors, dentists, pharmacists and nurses as well as visionary leaders.

Hawler Medical University is committed to academic freedom and the principles of equal opportunity with no discrimination in delivering its services and applying knowledge with high standards of intellectual, educational and research productivity. It is intended to become a learning institution that provides education and research services in all fields of health and education like a modern medical university in a well-developed country.

During the last few years, there have been a complete review and revision of the study programs and the learning methods in the different colleges. The College of Medicine has been successful in shifting from the classical medical curriculum toward the spiral integrated medical curriculum model. There has been a particular focus on applying Small group teaching and problem based learning. The important topics of communication skills, scientific debate, critical thinking, professionalism, and ethics have been incorporated into the study program. All the colleges in the university started to apply these changes in their study programs. Some of the colleges are working to shift the study program toward a credit based system based on the Bologna process.
The university has taken important steps toward digitalization of the learning and management systems. A new Moodle system has been installed successfully, and it is used as an online learning platform. Digitalizing of the continuing professional development and faculty portfolio systems have been successfully achieved. A new and modern website has been launched for the university.

In terms of internationalization, the university has established several academic collaboration agreements with international universities and implemented several collaborative projects in research and other academic activities such as students exchange and collaborative postgraduate study programs. The partner universities include universities from the United States such as the University at Albany and universities from European counties such as the UK, Germany, and Poland.

In terms of scientific research, the university includes an advanced and well equipped Medical Research Center, and the university encourages the staff to conduct research and publish their papers in internationally reputed journals. Training and capacity development programs are continuously provided to the faculty staff and postgraduates students. The Center for Research and Education in Women’s Health has been established at Hawler Medical University to promote research on women's health and gender differences related to health.

Hawler Medical University witnessed rapid advance in the ranking process at the national and international level. It is currently ranked in the first groups of universities in the National University Ranking in Iraqi Kurdistan Region. The university is also ranking 5th in Iraq according to the Round University Ranking. Hawler Medical University ranks first in the Iraqi Kurdistan Region in the faculty staff ranking domain.

Hawler Medical University frequently and regularly organizes scientific activities such as conferences, workshops, and symposiums. The previous conferences of Hawler Medical University had addressed important topics such as directing scientific research to address the community needs and promoting the medical education in Kurdistan Region. The 4th International Scientific Conference addressed the important and the prevailing topics of mass graves and genocide under the theme of 'Towards scientific identification of mass graves and genocide in Kurdistan Region.'

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## Table of Contents

<table>
<thead>
<tr>
<th>Title</th>
<th>Presenter(s)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference Organizing Committee</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Conference Scientific Program</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Presenters’ Biography</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>Keynote Speech Summary</strong></td>
<td></td>
<td>11-17</td>
</tr>
<tr>
<td>Genocide in Kurdistan Region should not be Ignored!</td>
<td>Azhin Omer</td>
<td>11</td>
</tr>
<tr>
<td>Supporting a Sustainable Mechanism to Use GIS in the Forensic</td>
<td>Garikai Mpande</td>
<td>12</td>
</tr>
<tr>
<td>Investigation for the Missing Persons’ Issue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhancing the Support for Women and Children Affected by the</td>
<td>Ayman Mostafa</td>
<td>13</td>
</tr>
<tr>
<td>Conflict: Legal Component</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Estimation at Death Using Teeth</td>
<td>Khurshid Khrwatany</td>
<td>14</td>
</tr>
<tr>
<td>The Role of Medical Expertise in the Documentation of Genocide:</td>
<td>Susannah Sirkin</td>
<td>15</td>
</tr>
<tr>
<td>A 30 Year Retrospective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Actions of Chemical Weapons</td>
<td>Kawa Dizaye</td>
<td>16</td>
</tr>
<tr>
<td>پوختەی بەمکاریتی نادی کێمەیەیی لەلاویان داەغوشەیە</td>
<td>Rekar Mzoiri</td>
<td>17</td>
</tr>
<tr>
<td><strong>Research papers</strong></td>
<td></td>
<td>18-101</td>
</tr>
<tr>
<td>Forensic Investigation of Barzani Mass Grave Skeletal Remains</td>
<td>Yasin K. Amin</td>
<td>18</td>
</tr>
<tr>
<td>at Busaya Desert in Samawa- Iraq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>حکم الإبادة الجماعية في الشريعة الاسلامية و الديانات الأخرى: القومية الكردية نموذجا</td>
<td>Yaseen Kareem</td>
<td>24</td>
</tr>
<tr>
<td>Documentation of Kurdish Genocide and Common Diseases Occurred</td>
<td>Kareem F. Aziz</td>
<td>34</td>
</tr>
<tr>
<td>among Victims after Genocide: Retrospective Study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass grave excavation and osteological evaluation of mass grave in</td>
<td>Yasin K. Amin,</td>
<td>43</td>
</tr>
<tr>
<td>Shaxke- Duhok</td>
<td>Yassine K. Amin, Goran Q. Othman</td>
<td></td>
</tr>
<tr>
<td>Forensic Investigation of Two Christian and Muslim Mass Graves</td>
<td>Yassine K. Amin, Goran Q. Othman</td>
<td>47</td>
</tr>
<tr>
<td>Skeletal Remains in Sorya-Duhok governorate- Iraqi Kurdistan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role of women after genocide among Barzani families in the</td>
<td>Paywand S. Naqshbandi</td>
<td>53</td>
</tr>
<tr>
<td>Kurdistan Region of Iraq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lived Experience of the Activists of Barzani Genocide: A Phenomeno</td>
<td>Muaf A. Karim</td>
<td>59</td>
</tr>
<tr>
<td>logical Study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biochemical Mechanisms and Methodologies Applied to the Study of</td>
<td>Daniele S. Persike</td>
<td>65</td>
</tr>
<tr>
<td>Posttraumatic Stress Disorder (PTSD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Challenges of Women of Martyr Families in Erbil City</td>
<td>Hamdia M. Ahmed</td>
<td>75</td>
</tr>
<tr>
<td>Delayed Skin, Neurological and Ophthalmological Complications of</td>
<td>Dindar Sh. Qurtas</td>
<td>80</td>
</tr>
<tr>
<td>Chemical Weapons in Peshmargas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cytogenetic study among chemical bombardment survivors in</td>
<td>Sheemans H. Mohammed</td>
<td>86</td>
</tr>
<tr>
<td>Shekh Wasan and Balisan valley Kurdistan Region-Iraq</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Biochemical and Hematological Follow up of Peshmargas</td>
<td>Mohammed Y. Qader, Ahmad M.</td>
<td>93</td>
</tr>
<tr>
<td>Exposed to Chemical Weapon</td>
<td>Mekaail</td>
<td></td>
</tr>
<tr>
<td>Mortality and kidnapping estimates for the Yazidi population in the</td>
<td>Nazar Shabila</td>
<td>101</td>
</tr>
<tr>
<td>area of Mount Sinjar, Iraq, in August 2014: A retrospective household survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conference Organizing Committees

Conference Higher Committee

Assist. Prof. Dr. Fareed H. Abdulahad
Assist. Prof. Dr. Yasin K. Amin
Prof. Dr. Sirwan K. Ali
Assist. Prof. Dr. Abubakir M. Saleh
Dr. Sherzad A. Shabu

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Dr. Aveen F. Haji Mam
Dr. Ayshan R. Yassin

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Brwa Abdulrahman
Bestoon Qassem
Shaymaa Sabri
Ibrahim Ziwar
Conference Scientific Program

Day I – 7th November 2018

8:30-9:30  Registration
9:30-10:00  Opening Ceremony
10:00-10:45  Keynote Lecture: Background of the Genocide in Kurdistan – Mr. Fadhil Mirani
10:45-11:15  Gallery and Coffee Break
11:15-12:00  Panel-Molecular Identification of Victims of Genocide
  Dr. Yassin K. Amin, Paywast J. Jalal, Dr. Ayshan R. Yassin
  Moderator: Dr. Aveen F. Haji Mam

Session 1 – (12:00 -13:00)  Genocide and Mass Graves
Moderators: Prof. Kawa Dizaye, Dr. Daniele S. Persike

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00-12:15</td>
<td>Keynote Lecture: Genocide in Kurdistan Region Should not be Ignored!</td>
</tr>
<tr>
<td></td>
<td>Dr. Azhin Omer</td>
</tr>
<tr>
<td>12:15-12:30</td>
<td>Forensic Investigation of Barzanan Mass Grave Skeletal Remains in Busaya Desert in Samawa</td>
</tr>
<tr>
<td></td>
<td>Dr. Yassin K. Amin</td>
</tr>
<tr>
<td>12:30-13:00</td>
<td>Questions and Discussion</td>
</tr>
<tr>
<td>13:00-14:00</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

Session 2 – (14:00-16:00)
Legal Issues and Documentation of Genocide
Moderators: Dr. Azhin Omer, Dr. Samir Othman

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00-14:15</td>
<td>Religion Perspective of Genocide (in Arabic)</td>
</tr>
<tr>
<td></td>
<td>Dr. Yassin Bahrkay</td>
</tr>
<tr>
<td>14:15-14:30</td>
<td>Supporting a Sustainable Mechanism to Use GIS in Forensic Investigation for the Missing Persons’ Issue</td>
</tr>
<tr>
<td></td>
<td>Garikai Crispen Mpande, Dr. Tareq Omair</td>
</tr>
<tr>
<td>14:30-14:45</td>
<td>Enhancing The Support for Women and Children Affected by The Conflict: Legal Component</td>
</tr>
<tr>
<td></td>
<td>Mr. Ayman Mostafa</td>
</tr>
<tr>
<td>14:45-15:00</td>
<td>Mortality and Kidnapping Estimates for the Yazidi Population: A Retrospective Household Survey</td>
</tr>
<tr>
<td></td>
<td>Dr. Valeria Cetorelli, Dr. Nazar Shabila</td>
</tr>
<tr>
<td>15:00-15:15</td>
<td>Gaps in Medical Research and Documents Regarding Kurdish Genocide in Kurdistan Region</td>
</tr>
<tr>
<td></td>
<td>Dr. Hamdia M. Ahmed, Dr. Aveen F. Haji Mam, Dr. Arazoo Falahi, Kathryn Mishkin</td>
</tr>
<tr>
<td>15:15-15:30</td>
<td>Documentation of Kurdish Genocide: A Retrospective Study</td>
</tr>
<tr>
<td></td>
<td>Dr. Kareem F. Aziz, Jawdat M. Al-Hagbaker, Sideeque Sadir, Yousif Muhammad</td>
</tr>
<tr>
<td>15:30-16:00</td>
<td>Questions and Discussion</td>
</tr>
</tbody>
</table>
**Day II – 8th November 2018**

**Session 3 – (9:00-11:00)**

Forensic Anthropology and Role of DNA and Molecular Identification of Victims of Genocide  

**Moderators:** Prof. Ali Al-Dabbagh, Dr. Arthur Saniotis

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-9:15</td>
<td>Keynote Lecture: Age Estimation at Death Using Teeth</td>
</tr>
<tr>
<td></td>
<td>Dr. Khurshid A. Kheder Khrwatany</td>
</tr>
<tr>
<td>9:15-9:30</td>
<td>Mass Grave Excavation and Osteological Evaluation of Peshmarga Mass Grave in</td>
</tr>
<tr>
<td></td>
<td>Shakhke –Duhok</td>
</tr>
<tr>
<td></td>
<td>Dr. Yassin K. Amin</td>
</tr>
<tr>
<td>9:30-9:45</td>
<td>Forensic DNA Analysis Technologies in the Identification of Human Remains in</td>
</tr>
<tr>
<td></td>
<td>Mass Graves</td>
</tr>
<tr>
<td></td>
<td>Dr. Soza T. Baban</td>
</tr>
<tr>
<td>9:45-10:00</td>
<td>The Actions of Chemical Weapons</td>
</tr>
<tr>
<td></td>
<td>Prof. Kawa Dizaye</td>
</tr>
<tr>
<td>10:00-10:15</td>
<td>Forensic Investigation of Two Christian and Muslim Mass Graves.</td>
</tr>
<tr>
<td></td>
<td>Dr. Yassin K. Amin, Dr. Goran Q. Othman</td>
</tr>
<tr>
<td>10:15-10:30</td>
<td>The role of medical expertise in the documentation of genocide: A 30 year</td>
</tr>
<tr>
<td></td>
<td>retrospective</td>
</tr>
<tr>
<td></td>
<td>Susannah Sirkin</td>
</tr>
<tr>
<td>10:30-11:00</td>
<td>Questions and Discussion</td>
</tr>
<tr>
<td>11:00-11:15</td>
<td>Coffee Break</td>
</tr>
</tbody>
</table>

**Session 4 – (11:15-13:00)**

Health and Psychosocial Consequences of Genocide  

**Moderators:** Prof. Sirwan Ali, Dr. Arazoo Fallahi

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15-11:30</td>
<td>Role of Women after Genocide among Barzanian Families</td>
</tr>
<tr>
<td></td>
<td>Mrs. Paywand Naqshbandi; Dr. Muaf Abdulla</td>
</tr>
<tr>
<td>1:1:30-11:45</td>
<td>Uncovering PTSD Symptoms: What is the Psychological Impact of Genocide on</td>
</tr>
<tr>
<td></td>
<td>Survivors and How this been Deal with by Healthcare Provision in Kurdistan</td>
</tr>
<tr>
<td></td>
<td>Region of Iraq (KRI)</td>
</tr>
<tr>
<td></td>
<td>Dr. Azhiin Omar, Dr. Kay Wheat, Dr. Aveen F. Haji Mam</td>
</tr>
<tr>
<td>11:45-12:00</td>
<td>Lived Experience of the Activists of Barzanian Genocide: A Phenomenological</td>
</tr>
<tr>
<td></td>
<td>Study</td>
</tr>
<tr>
<td></td>
<td>Dr. Muaf Abdulla, Dr. Hamdia M. Ahmed, Dr. Tiran J. Piro</td>
</tr>
<tr>
<td>12:00-12:15</td>
<td>Biochemical Mechanisms and Methodologies Applied to the Study of Posttraumatic</td>
</tr>
<tr>
<td></td>
<td>Stress Disorder</td>
</tr>
<tr>
<td></td>
<td>Dr. Daniele S. Persike, Dr. Suad Y. Al-Kass</td>
</tr>
<tr>
<td>12:15-12:30</td>
<td>Health Challenges of Women of Martyr Families in Erbil City</td>
</tr>
<tr>
<td></td>
<td>Dr. Hamdia M. Ahmed</td>
</tr>
<tr>
<td>12:30-13:00</td>
<td>Questions and Discussion</td>
</tr>
<tr>
<td>13:00-14:00</td>
<td>Lunch</td>
</tr>
</tbody>
</table>
**Session 5 – (14:00-16:00)**

**Effect of Chemical Weapon on the Kurdish People**

**Moderators:** Prof. Kawa Dizaye, Dr. Nawsherwan Mohammad

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00-14:15</td>
<td>Delayed Skin, Neurological and Eyes Complications of Chemical Weapons in Peshmargas&lt;br&gt;<strong>Dr. Dindar Sh. Qurtas</strong>, Dr. Abdullah F. Ahmed, Dr. Barzan A. Ahmed, Dr. Barzhang Q. Saleem</td>
</tr>
<tr>
<td>14:15-14:30</td>
<td>Using Chemical Weapon by ISIS (in Kurdish)&lt;br&gt;<strong>Mr. Rekar Mzwri</strong></td>
</tr>
<tr>
<td>14:30-14:45</td>
<td>Cytogenetic Study among Chemical Bombardment Survivors in Shekh Wasan &amp; Balisan Valley Kurdistan Region-Iraq&lt;br&gt;<strong>Miss Sheeman H. Mohammed</strong>, Dr. Hazha J. Hedayat</td>
</tr>
<tr>
<td>14:45-15:00</td>
<td>Clinical Biochemical and Hematological Follow-up of the Peshmarga’s Exposed to Chemical Weapon&lt;br&gt;<strong>Dr. Mohammad Y. Qader</strong>, <strong>Dr. Ahmed M. Argushi</strong></td>
</tr>
<tr>
<td>15:00-15:30</td>
<td>Questions and Discussion</td>
</tr>
<tr>
<td>15:30-16:00</td>
<td>Closing Ceremony</td>
</tr>
</tbody>
</table>
Presenters’ Biography

Mr. Fadhil Mirani
Mr. Fadhil Mirani was born in Mosul in 1948. He joined the Kurdistan Democratic Party (KDP) in 1966 and became a member of the political bureau of the party since 1979. He served as the Minister of Interior in the Kurdistan Regional Government from 1996 to 2000. He is the secretary of the political bureau of the KDP since 2004. He speaks Kurdish, Arabic, English, Persian and Turkish languages.

Dr. Yasin K. Amin
Dr. Yasin has M.Sc. of Anatomy and Histology from Salahaddin University in 2002 and Ph.D. of Embryology from Hawler Medical University in 2009. He is also graduated as Forensic Medicine and Forensic Anthropology in Bournemouth University 2005. He joined Hawler Medical University in 2002 and worked as a lecturer in different fields of anatomy, embryology, and forensic anthropology. Dr. Yasin worked on the exhumation of mass graves in Iraq especially Kurdish mass grave in the south of Iraq and genocide with the chemical bomb attack of Kurdish civilian people in Halabja and ISIS war. He obtained the assistant professor academic title in 2009 and served as the director general of Medico legal Institute (MLI) of Kurdistan Region since 2005. He is currently the director general of the Medical Research Center at Hawler Medical University.

Paywast J. Jalal
Paywast is a split-site PhD student in the field of Molecular Immunology at Sulaimani University in collaboration with the University of Nottingham. In 2010, she got an MSc degree in Molecular Virology from Sulaimani University. She is currently working as a researcher in the field of Molecular Biology at the Medical Research Center in Hawler Medical University. In 2004, she participated in a training course held by the Ministry of Health/KRG on Mass Graves and later she participated in exploring one of the mass graves near Halabjah. As an academic, she is an expert in molecular techniques and analysis of the molecular data.

Dr. Ayshan R. Yassin
Ayshan is a researcher of molecule genetic at the Medical Research Center, Hawler Medical University. She is a graduate of the Department of Molecule Biology, University of Salahaddin. She obtained MSc degree from the Department of Medical Biology Genetics, Gaziantep University, and PhD from the Molecule Genetic Department, Faculty of Medicine, Gaziantep University. She is currently working on two types of project about cancer cell line.
Dr. Azhin Omer
Azhin completed Law College in Amsterdam; Bachelor of Laws at Nottingham Law School; Master of Laws at De Montford University; and currently, a PhD Researcher at Nottingham Trent University. As a full-time lecturer, Azhin is the leader of master’s module on Terrorism & International Response; and lecturer of bachelor’s modules including Legal & Professional Environment; Tort & Case Analysis; Public Law & Legal Research Skills. Azhin is currently researching the healthcare system of Kurdistan region of Iraq under her PhD and aims to make recommendation for potential solutions. Azhin has recently published a chapter in Global patient safety book on patient safety strategies of Kurdistan region in Iraq. Azhin has also appeared and discussed the impact of political instabilities of Kurdistan region on the healthcare system in a number of national and international media channels including ITV News (2015) and BBC Radio (2014).

Dr. Yassin Bahrkay
Dr. Yassin Bahrkay has PhD in Islamic Sciences. He has worked as a lecturer, head of the department and assistant dean in different departments and colleges of the University of Salahaddin and Soran University.

Mr. Garikai Crispen Mpande
Mr. Garikai is a Certified GIS Professional (GISP) with more than 18 years of experience in GIS and Remote Sensing technologies. This experience has been accrued through the application of GIS in highly diverse fields that include agricultural research, mineral exploration, utilities management, land information management systems, peacekeeping operations, infrastructure development and currently in the search and identification of missing people. He has high level ability in acquiring, processing and outputting spatial and non-spatial data as well as extensive experience in setting up GIS web platforms. He holds MSc in GIS/LIS from the University of Zimbabwe.

Judge Ayman Mostafa
Judge Ayman has MSc in Forensic Criminology from Sheffield Hallam University and Diploma in Public Policy & Management, KDI School, Republic of Korea. He also has BA Law & Politics from the University of Salahaddin. He works as head and investigating judge for the commission of investigation & gathering evidence (CIGE) since 2014. He worked as a lecturer of criminal procedures code at Nawroz University, Department of Law in Duhok from 2013 to 2016. He worked as a judge for first instance court in Duhok from January to September 2014. He worked as a judicial investigator for Inquiry courts to investigate in misdemeanor, felony and anti-terrorism crimes from 1998 to 2013.
Dr. Nazar Shabila
Nazar has MSc degree in Public Health in Developing Countries from the London School of Hygiene and Tropical Medicine and Ph.D. in Community Medicine from Hawler Medical University. He is an assistant professor of public health at Hawler Medical University. He has more than 50 peer-reviewed publications. His current research work is primarily related to health services research, conflict and health, women’s health, and violence against women.

Dr. Aveen F. Haji Mam
Aveen was born in Erbil. She finished her PhD in Midwifery and Women Health at DMU in Leicester city UK. Her research interest areas are women health and empowering, Behavioral changes Models, health education programmes and health outcomes. In 2013, Aveen was the first Kurdish student, who get Queen Elizabeth grant to participate in a research training course in Cumberland lodge in Windsor Castle/ London. She collaborated actively with researchers in several other disciplines of sociology, health sciences, and Reproduction Health in particularly. She attended around 25-30 international and national conferences. Outside of professional interests, Aveen enjoys swimming, traveling, and reading books.

Dr. Kareem F. Aziz
Dr. Kareem has PhD in community health nursing from Hawler Medical University. He has 35 years of teaching experience in the field of community health nursing as well as research experiences. Presently, he is working as a faculty in the Nursing Department of the College of Nursing. He is the member in MSHOK organization for health education and member in the scientific committee for breast cancer prevention and early detection in the ministry of health in Kurdistan Region. He has a number of publications in both national and international peer-reviewed indexed journals and also has been serving as an editorial board member as well as the reviewer of Erbil Nursing and Midwifery Journal.

Dr. Khurshid A. Khrwatany
Dr. Khurshid has a Doctor of Maxillofacial Surgery degree from Russia. He is a lecturer at the Department of Oral and Maxillofacial Surgery at the College of Dentistry, Hawler Medical University. He is also a Consultant and Operative Surgeon at Rezgari Teaching Hospital. He has participated in different workshops, training courses, and conferences.
Dr. Soza Tharwat Baban
Dr. Soza is a biomolecular and medical microbiology specialist. She is a lecturer in Molecular Medical Microbiology in the College of Health Sciences, Hawler Medical University and she is the director of infection prevention and control system at the Surgical Specialty hospital in Erbil. She has PhD in Molecular Medical Microbiology from the University of Nottingham in 2011, where she studied the virulence of the human hypervirulent UK-outbreak hospital strain of Clostridium difficile infection in the UK. She has MSc in Molecular Clinical Microbiology from the University of Nottingham 2007. She has more than nine years of research activities focus on biomolecular and laboratory medicine and molecular diagnostics, hospital prevention and control of infections caused by multi-resistant hospital-acquired pathogens.

Prof. Kawa Dizaye
Prof. Kawa has PhD in Medical Pharmacology. He is a Professor of Medical Pharmacology at the College of Medicine, Hawler Medical University. He is a member of Halabja Medical Institute (HMI) which dealt with long term effects of chemical weapons on health in Kurdistan of Iraq from 1999 to 2002. He participated in the meetings of several Chemical and Biological Medical Treatment Symposia series in Switzerland, France, and Croatia. He is a member of scientific committees in different universities, Ministry of Higher Education and Ministry of Health in Kurdistan and Iraq. He has more than 55 published papers. He has supervised more than 40 Master and PhD students.

Dr. Goran Q. Othman
Dr. Goran has M.Sc. in genetics and Ph.D. in cell biology. He joined Erbil Polytechnic University in 2010 after spending eight years as a lecturer and researcher at Salahaddin University. He also worked in the Erbil Medico-legal Institute for six months working on mass grave and genocide cases. He gained assistant professor academic title since 2015 and served as the director of the scientific research center and the manager of Polytechnic journal in Erbil Polytechnic University. His fields of research include cancer biology and oxidative stress, and he supervises a number of PGD and MSc students.

Susannah Sirkin
Sirkin is the Director of Policy at Physicians for Human Rights (PHR), where she has worked since 1987. Sirkin has organized health and human rights investigations to dozens of countries including documentation of genocide and systematic rape in Darfur, Sudan; exhumations of mass graves in the former Yugoslavia and Rwanda for the International Criminal Tribunals; and documentation of Saddam Hussein's use of chemical weapons against Iraqi Kurds in the 1980s. She has authored and edited numerous reports and articles on the medical consequences of human rights violations, physical evidence of human rights abuses, and physician complicity in violations. Sirkin regularly lectures on health, human rights, and international humanitarian law in medical schools and schools of public health. She also served from 1992 to 2001 for PHR as a member of the Coordination Committee of the International Campaign to Ban Landmines, the co-recipient of the 1997 Nobel Prize for Peace.
Mrs. Paywand Naqshbandi
Paywand is a graduate of the Nursing College at Hawler Medical University. She continued practicing her job for four years as Assistance Lecturer in Nursing and Midwifery Department at the University of Polytechnique in Hawler. She finished MSc degree in maternity nursing. After she received her high degree education, her accomplishments did not end. She has been in the current position as a headquarters of Midwifery Department and Nursing Department since February 2016. She encourages young people—especially women and girls—to study hard. Her life example teaches us to follow our dreams, no matter how great.

Dr. Muaf Abdulla
Dr. Muaf has BSc Nursing from the College of Nursing, Hawler Medical University in 2005, MSc Cardiothoracic Nursing from Bharati Vidyapeeth University-Pune, India in 2012, and PhD Nursing from Tehran University of Medical Sciences in 2016. He is the Director of Continuous Professional Development in General Directorate of Erbil Health. As a part of his expertise as a researcher, he has experience in both quantitative and qualitative research and published ten articles including ISI, PubMed, and scientific research studies. At present, he has six papers that are under review which will be published shortly.

Dr. Daniele Suzete Persike
Daniele is Brazilian, Professor and Visitor Researcher at the University of Dohuk. She is graduated in Pharmacy and MSc in Biochemistry, both at Universidade Federal do Paraná. She received her PhD in Pharmacology at Universidade de São Paulo, which was followed by two post-doctoral positions at Universidade Federal de São Paulo. Daniele’s focus on protein biochemistry has involved studies on cell signaling and apoptosis, enzymology (proteolysis and activity of caspases), neuroproteomics, and search for new compounds for the treatment of epilepsy, which has resulted in valuable published articles.

Dr. Hamdia M. Ahmed
Dr. Hamdia has MSc and PhD degree in Maternity Nursing from Hawler Medical University. She is an assistant professor, and she is head of Midwifery Department in the College of Nursing and Director of the Center for Research and Education in Women’s Health in Hawler Medical University, Erbil, Iraq. She has more than 25 research papers in fields of women’s health, health services research, conflict and health and medical education in Iraqi Kurdistan contexts that have been published in peer reviewed journals. Her current research interest is primarily related to women’s health in the Iraqi Kurdistan Region. Hamdia has obtained and successfully implemented a number of research and projects for improving nursing and midwifery care in the Kurdistan region.
Dr. Dindar Sh. Qurtas
Dr. Dindar is a lecturer of dermatology at the College of Medicine, Hawler Medical University. He has a Master Degree in Dermatology from the Russian Federation in 2008 and a Ph.D. in Dermatology from the Russian Federation in 2011. He was the head of the Scientific Research Unit in DoH Erbil 2013-2016, and he is the Director of Erbil Dermatology Teaching Center since 2016. He is the head of Dermatology Unit in the College of Medicine, Hawler Medical University since 2017. He is a trainer of the Dermatology Programs of both the Kurdistan Board for Medical Specialties and the Arab Board for Health Specialties.

Mr. Rekar Mzwri
Faris Tahir Maho, known as Rekar Mzwri, is a graduate of Erbil Teacher’s Institute in 1988. He has published 22 books, including ten books on the Kurdish nation genocide. He has produced four short documentaries and carried out eight photography and documents exhibition in the different governorates of Kurdistan and Iraq.

Miss Sheeman H. Mohammed
Sheeman has a Higher Diploma in Genetics and MSc degree in Molecular Genetics from the College of Education, Salahaddin University. She is an assistant lecturer in the Midwifery Department, College of Nursing, Hawler Medical University. She teaches different courses including genetics including genetic diseases, embryology, and pharmacology.

Dr. Ahmed M. Argushi
Dr. Ahmad is a graduate of the College of Medicine, Hawler Medical University. He successfully completed the VIP Medical Support Course with Prometheus Medical (Consolidation/advancement of training within six months) at Birmingham in 2009. He participated in a clinical observership program in the Medical University of Vienna in 2011. He completed a training course in radiology for two years. He worked as a radiologist for two years. During the war against the ISIS, he actively participated in management and follow up of injured Peshmarga in frontlines especially observation and follow up of injured Peshmarga by chemical attack. Currently, he is a Health Consultant in Kurdistan Region Security Council.

Dr. Mohammad Y. Qader
Dr. Mohammad is a follow of the Arab Council of Medical Specialties. He works as an internist at Erbil Teaching Hospital and West Erbil Emergency Hospital. He has participated in different workshops and training courses. His research is related to different fields of internal medicine and the effect of exposure to chemical weapons on different body parameters.
Keynote Speech Summary

Genocide in Kurdistan Region should not be Ignored!

Azhin Omer
Nottingham Trent University
E-mail address: azhin.omer@ntu.ac.uk

The purpose of this presentation is to introduce the audience to the 4th International Scientific Conference at Hawler Medical University by reinforcing the violation of International Law on genocide in Kurdistan Region. As a Doctoral Legal Researcher on Kurdistan Region, and an Academic Lawyer at Nottingham Law School (United Kingdom), I have knowledge and understanding about the International Law regulating the crime of genocide. The proposed presentation will cover three main parts, namely the history of Kurdistan Region, the International Law on genocide, and the violation of international law in the Kurdistan Region. It starts by considering the historical background of the Kurdistan Region, more specifically the deliberate killing of thousands of Kurdish nationals in Kurdistan region in Iraq.

In order to highlight the violation of international law on genocide, the second part of the presentation will focus on the international legal provisions on genocide with a particular focus on the key requirements under the Convention on the Prevention and Punishment of the Crime of Genocide (1948). Under the third part of the presentation, the legal requirements under the 1948 convention will be applied to the previous and present acts of deliberate killing of Kurdish nationals to establish the violation of international legal rights of Kurdish nationals in Kurdistan region.

This presentation offers value to the audience, as the key take-a-way points include:

- An overview of the historical background of the Kurdistan Region;
- Raising awareness about the unjustified actions of deliberate killings of Kurdish population;
- Highlighting the applicable International Law to the unjustified actions of deliberate killings of Kurdish population; and
- Confirming the violated International Law on genocide in Kurdistan Region.
Supporting a Sustainable Mechanism to Use GIS in the Forensic Investigation for the Missing Persons' Issue

Garikai Mpande, Rebeca Iglesias, Tareq Omairi, Photis Andronicou, and Caroline Barker

* Iraq Program, International Commission on Missing Persons, Erbil, Kurdistan region- Iraq

E-mail address: tareq.omairi@icmp.int

Forensic geoscience is an emerging field, involving the application of spatial analysis and environmental science techniques for investigating cases, in the aim of bringing evidence to the court of law. The spatial analysis involves the use of location as defined by X, Y, Z parameters (grid coordinates and elevation) to explain the occurrence of features on the earth's surface. This tends to increase the potential for a higher degree of success in forensic search investigations.

Geographic Information System (GIS) is a support tool offering a spatial analytical capability to collect, integrate and analyze different types of geo-referenced data relevant to forensic cases. The concept of a real-time GIS-based forensic decision-making tool is to offer an interface between information collection and spatial analysis to provide regular support for ongoing and historical investigations.

GIS capabilities have not been routinely used in the collection of spatial data and the development of search and location strategies for large scale missing persons’ cases, homicide graves or other buried objects in Iraq. Through the International Commission on Missing Persons (ICMP) engagement and cooperation with the Commission of Investigation and Gathering Evidence (CIGE), which ICMP has assisted and supported since 2016, the presentation will show the potential for the application of GIS technology to all era missing persons cases and recommend a way forward to creating a sustainable body of expertise in this area, as part of an integrated and comprehensive approach to addressing the challenge of missing persons.

Keywords: GIS, Forensic, Missing Persons, Geographic, ICMP, and Mass-graves.
Women are often considered particularly vulnerable in conflict. They often prove to be surprisingly strong at coping with difficulties. Women and children must be protected in particular against all forms of assault during the conflict (Articles 76 and 77 of Additional Protocol I 1977 Geneva Convention). There is a tendency for women and children in armed conflict to be systematically viewed as an especially vulnerable category of victims, and they are increasingly targeted. In a statistic based on the daily data from investigation procedures in the Commission for Investigation & Gathering Evidence (CIGE), the findings revealed that women and children were the most vulnerable affected category in the armed conflict. The vulnerability to violations has a disproportionate effect on children, adolescents, and women, placing them at a disadvantage which limits the time they take to recover and survive. The key issues have been outlined into two pillars for systemic support of conflict-affected women and children. In the existing post-conflict legal situation, victims have lost the documents required to prove their previous position and direct or indirect victims are affected by grave violations, are in need to deal with the new and existed (post-conflict) legal position. During the conflict, for protection purposes, marriages took place following customs and traditions with no record of marital status in court records and the civil register. The principle of Do No Harm is a central ethical pillar for interventions that aim to support conflict-affected victims fortified with a well-intended intervention plan to avoid any unintended negative consequences. Putting measures in place for the dependents can make alternative arrangements for the legal and financial affairs of their missing loved one by having guardianship powers in place. A certificate of presumed death can be issued to resolve all the suspended affairs of a missing person, in the same way as a death certificate. The authority would allow an application for an order of a presumed death after four years of an incident. During curatorship, the authority would allow the family to maintain and conduct the missing person's estate. Court order of curatorship will protect the financial position of the missing person for his or her dependents. It is recommended to incorporate the international crimes (genocide, crimes against humanity and war crimes) in Kurdistan retributive legal system to provide transitional justice to victims and prevent the commission of these grave violations in future. There is a need to legislate new legislation to address the existing issues related to the unwanted pregnancies and newly born infants as a result of a sexual assault in conflict.
Age Estimation at Death Using Teeth

Khurshid A. Kheder Khrwatany
Hawler Medical University
Email address: kh.khrwatany@den.hmu.edu.krd

Unknown bodies of murdered people make a huge challenge for recognition. Perhaps, the age determination of victims may shorten the list and help to be close to identification. Teeth are those organs that minimally changes after death. Both, development and wearing of teeth, recently used as a tool for age estimation. The development of teeth can be used up to the age of 25th, while tooth wear can be used for the rest. Also, tooth- jaw bone relation has its role too. If the personal dental data of population were recorded, it was much easier to belong each body to his own identification data.
The Role of Medical Expertise in the Documentation of Genocide: A 30 Year Retrospective

Susannah Sirkin, Physicians for Human Rights

Physicians for Human Rights (PHR) has provided medical and forensic expertise to the analysis, documentation, and prosecutions for the crime of genocide in several regions during the past 30 years. I will provide an overview and examples (including through photographs and graphs) of the range of techniques that our medical and public health experts have used in these efforts. They include:

- Use of public health survey methods to document the use of poison gas by the Government of Saddam Hussein against Iraqi Kurds in 1988
- Forensic documentation of the genocidal assault of the Kurdish village of Koreme including grave exhumation (report by Human Rights Watch and PHR)
- Exhumation and examination of the graves at Srebrenica, Bosnia for the ICTY and the documentation of the massacre of hospital patients and staff in Vukovar, Croatia (1992-1996), used in the prosecutions for Bosnian Serb leaders for the crime of genocide
- Documentation and analysis of genocidal assaults on the population of Darfur, Sudan, through PHR study, “Assault on Survival” and analysis under Article 2c of the Convention on Genocide, cited in the indictment for genocide by the ICC;
- Current documentation of genocidal attacks against the Rohingya population of Myanmar, based on PHR’s medical examinations of survivors and epidemiological survey with academic partners of hundreds of survivors recently conducted in Bangladesh.
Research in Kurdistan has proved that as many as 2.9% of the Kurdish population has been exposed to the chemical weapon at some level between August 1983 and March 1988. About 40 Kurdish villages and thousands of innocent civilians were exposed to Chemical weapon. In April of 1987, the villages Balisan and Sheik Wasan were attacked by chemical weapons, more than a hundred people were killed mostly women and children. On March 16, 1988, Halabja was attacked. The attack killed around 5,000 people and injured 7,000 to 10,000 more, most of them civilians. Thousands more died of complications, diseases, and birth defects in the years after the attack; moreover, chemical weapons such as Chlorine bomb has been used extensively in different areas in Iraq during 2007 and Kurdistan in between 2014-2017 by terrorists. According to the (OPCW), the term chemical weapon can be applied to any toxic chemical or its precursor that can cause death, injury, temporary incapacitation or sensory irritation through its chemical action. Depending on their severity and toxicity Chemical weapon can be divided into two major groups; incapacitating agents like LSD and Diphenylchloroarsine, which are administered mainly, by law enforcement agencies to temporarily and non lethally impair the performance of an enemy or to maintain social order, quell civil disturbances and stop political violence. The second group; Lethal toxic chemical agent are Nerve gas, blistering, choking and Blood agents. Chemical weapons are highly toxic compounds. For instance, nerve gas or blood agents can kill people within a few minutes after exposure. Chemical weapons induce their toxicity and lethality through different mechanisms of action. For instance, Sarine acts by blocking cholinesterase; Hydrogen cyanide blocks cytochrome oxidase, while Phosgene oxime inactivates the nitrogenous bases of DNA (Guanine).
Using Chemical Weapon by ISIS (in Kurdish)

Rekar Mzoori
Email Address: rekar.mzoori48@gmail.com

پوخته‌ی ب‌کار‌ه‌نی‌ندی چ‌کی کیمیاوی ل‌ه‌لا‌ی‌ان داعش‌رده

ریکار مژوبری

ل‌ه‌گ‌ل‌ه‌ن‌تی ل‌ش‌ک‌م‌ک‌ری داعش بو داگ‌کن‌دنی کورد‌س‌ت‌ان ب‌ر‌خ‌و‌د‌انی پ‌ن‌ش‌م‌ر‌گ‌ه داعش پ‌ه‌غای ب‌ر‌ده ب‌ر چ‌کی

ق‌د‌اد‌غ‌ک‌راوی یو‌د‌ود‌ول‌ع‌ل‌ع‌ن‌ی نزیک‌ه 8 ه‌ع‌ش‌ت جار چ‌کی کیمیاوی دژی پ‌ن‌ش‌م‌ر‌گ‌ه ب‌ک‌ار ه‌ات‌و‌ه نزیک‌ه 5000

پ‌ن‌ش‌م‌ر‌گ‌ه بو‌ن‌تی قو‌رب‌انی ن‌ام ج‌ا‌ک‌ه ق‌د‌اد‌غ‌ک‌راوی ب‌ر‌ن‌د‌ا‌ر ش‌ه‌ف‌عی ب‌و‌ز‌ه‌ن‌ه لی‌ک‌و‌ل‌پ‌ن‌م‌ی‌و‌ک‌م د‌ی‌ک‌م‌م‌ین‌ت‌اری ب‌ر‌ا‌ر‌ک‌اری

م‌ع‌د‌ا‌ن‌ی‌ه‌ی ق‌س‌م‌ر ب‌ک‌ار‌ن‌ی‌ندی چ‌کی کیمیاوی له لِای‌ن ب‌ع‌س و داعش‌و بو‌ع‌ط‌اع‌و ن‌ام‌ار‌و و‌یر‌ا‌ن‌ک‌اری داعش و

ب‌ع‌س‌ی‌ک‌ا‌ن‌ روون د‌ک‌م‌س‌و‌ه ق‌ی‌و‌و د‌م‌د‌و ن‌ا‌د‌ا‌ر لُو‌ز‌یه ن‌ی‌س‌ل‌ا‌می ع‌رو‌بی ب‌ع‌س‌ی‌ ن‌ی‌ش‌ت‌ر‌اک‌ی ع‌رو‌بی ه‌م‌سو و ه‌م‌لو‌ک‌یان

د‌ا‌و بو ل‌ه‌خ‌ا‌ب‌ر‌ن‌دی ن‌ا‌ب و ک‌ا‌س‌ه ن‌ا‌ت‌م‌ک‌ا‌ن‌ی ع‌ب‌ر‌اچ و م‌ک‌ ت‌و‌ر‌ک‌م‌ا‌ن‌ ن‌ا‌ش‌و‌ری ک‌ل‌ا‌ن‌ی شِب‌ع‌ک ک‌و‌ر‌د ک‌ا‌ک‌ه ن‌ی‌ز‌دی.

لی‌ک‌و‌ل‌پ‌ن‌م‌ی‌و‌ک‌م سن یا‌ش‌ه

ب‌ع‌ش‌ی‌ ی‌ع‌م‌ک‌ه ب‌ک‌ار‌ن‌ی‌ندی چ‌کی کیمیاوی له لاین به‌ع‌س‌مه بارزانی‌ک‌ه‌ن و م‌ک ن‌م‌و‌ن‌و‌ه

ب‌ع‌ش‌ی‌ دو‌وی‌م‌ه‌ی: ه‌نا‌تی داعش و و‌ی‌ر‌ا‌ن‌ک‌اری‌ه‌ک‌ان و ب‌ک‌ار‌ن‌ی‌ندی چ‌کی کیمیاوی له لاین داعش‌رده دزی پ‌ن‌ش‌م‌ر‌گ‌ه و

بارزانی‌کان و مک ن‌م‌و‌ن‌و‌ه

ب‌ع‌ش‌ی‌ سْی‌ب‌ی‌م‌: ب‌ر‌ار‌ور‌د‌ک‌اری ن‌ی‌و‌ن‌ی‌ان
Research Papers

Forensic Investigation of Barzanian Mass Grave Skeletal Remains at Busaya Desert in Samawa, Iraq

Yasin K. Amin
Medical Research Center, Hawler Medical University
Email address: dr.yasin@hmu.edu.krd

Abstract

Background and objective: Human identification and anthropological evaluation of mass graves are the key step towards the scientific documentation and achieving justice. This study aimed to investigate the exhumation, anthropological evaluation and individual victim identification of a mass grave in Busaya in Samawa governorate.

Methods: The investigation included excavation of the graves and identification of the victims. The field study was started after taking testimonies and witnesses for locating the site of graves. The sites were determined, which were excavated according to the scientific standard procedures. Gender determination, age and stature estimation were performed on the remnant skeletons in the laboratory of medico-legal institute-Erbil.

Results: The grave included 93 bodies, 66 of them were males which constitute about 71% of the bodies and 24 of them were possibly males which are approximately 26% percent of the bodies, while the others were not identified because of degradations happens to the bones. The results of age estimation reported that the number of young bodies under 20 years old were 5 cases (5.4%), while 53 out of 93 were young bodies between 20-29 years which constitute (57%). While the rest were more than 30 years old, except 8 cases which we could not identify them. The results of stature revealed that more than half of cases had stature more than 166 cm, while only 6 cases were less than 155 cm. All the remained bones were recorded in details for more documentation.

Conclusion: These finding described the anthropological evaluation of a large Barzanian mass grave in Busaya desert, South region in Iraq, which the majority (or all) of the victims were males and young people.

Keywords: Mass grave; Barzanian victims; Busaya; Exhumation; Identification.

Introduction

Investigation and identification of mass graves skeletal remnant are the most important steps toward documenting human rights violations and giving back to families the remaining skeleton of victims, which were considered, until exhumed, as lost or disappeared.¹

Mass graves in Iraq are identified as unmarked sites containing at least six bodies. Some can be characterized as deep pits that appeared to have been filled or by mounds of earth piled above the ground. However, older mass graves are difficult to found, because over this long period of time, they have been covered by debris and vegetation.² Various mass graves have been discovered in all regions of Iraq that contain people of different religious and ethnic groups in the country as well as foreign nationals, including Arabs such as Kuwaitis and Saudis.³

The Iraqi government estimates that there were 250000 to a million of missing people, according to the International Commission on Missing Persons (ICMP); however, some estimates put the number of missing from Saddam's attacks, including attacks against the Kurds in the 1980s and 1990s, at more than 1million. Therefore, the Kurdish people said, "There is another Iraq, buried under Iraq."⁴
Iraqi Kurdistan Regional Government reported that many mass graves in Kurdistan region contained Iraqi Kurds, who were killed via a process of genocide because of their ethnicity. In 1983 during a military attack against Kurdish citizens in Barzan region, about 8000 individuals belonging to the Barzani tribe were rounded up by the regime in northern Iraq and executed in deserts near Basrah in the south of Iraq. Another operation against Kurds was in 1988, Anfal campaign, during which as many as 182,000 Iraqi Kurds disappeared. Most of them were belong to Garmian region. The men were separated from their families and were executed in deserts in the west and south-west of Iraq. The remnants of some of their wives and children have also been found in mass graves.

The main aim of this investigation was to present and discuss the exhumation, anthropological evaluation and individual victim identification of Barzanian mass grave in Busaya desert-Samawa governorate in the south region of Iraq.

Subjects and Methods

Study setting and design
The current study was designed as a descriptive investigation for the Barzanian mass grave in Busaya. The field work was started in November 2011 which included taking testimonies and witnesses, site description and excavation. The morgue study was performed in March 2013. The study duration was nine months.

Testimonies and Witnesses for Locating the Graves Sites
However, of the emotional influences on the witness's statements, but still they were the most important and reliable source of information for general or specific site location of the two graves. In this study, the witness's statements were depended on which they were victims saved from the killing.

Site Description and Assessment
Before the excavation took place, a preliminary visit to the suspected site was made to map the area to be excavated. Above all, it was insured that the area has been cleared of surface debris. The graves sites were in Busaya desert, which is located in Samawa governorate.

Excavation
After identifying the location of the two gravesites, the major dimensions (width, length and depth) were estimated as closely as possible. The surface of the ground was examined for finding any important evidence such as bullets, jewelry, personal belongings, etc. The soil was removed and then probed by careful used of picks and shovel and finally, with trowels and brushes.
Osteological Analysis
The osteological analysis was concerned with the determination of the identity of a skeleton, by estimating its age, gender and stature. A count of the ‘minimum number of individuals’ (MNI) was performed as standard procedure in osteological reports on inhumations in order to confirm how many individuals were present by the articulated and disarticulated human bones. The MNI was calculated by counting all long bone ends, as well as other larger skeletal elements recovered. The MNI was considered as the largest number of these skeletons. The MNI was mostly lesser than the actual number of skeletons which have been interred on the site, but it can represent the scientifically proven minimum number of individuals in the graves. Age was determined using standard aging techniques. Age estimation relies on the presence of the pelvis and uses different stages of bone development and degeneration in order to calculate the age of an individual. Age is split into two categories: Young victims include the ages below 18 years old, and adult victims, which include the ages equal or more than 18 years old.

Gender determination was carried out using standard osteological techniques, such as those described by gender assessment of gender in both males and females who relied on the preservation of the skull and the pelvis and could only be carried out once sexual characteristics have developed, during late puberty and early adulthood. Stature was estimated by applying the formula for the maximum length of femur developed using modern Portuguese samples.

Data Analysis
Microsoft Excel program was applied for summarizing and graphical presentation of the data. Percent values were calculated as a descriptive statistical analysis for the acquired data.

Results
Figure 2 illustrates the distribution of gender in the mass grave. According to our results, the majority of victims were males, as we reported 66 males (70.97%) in the grave among 93 bodies, while the number of cases which we considered them as possible males were 24 (25.81%) out of 93 victims, however only two bodies which we couldn't determine their genders.
Figure 2: Gender distribution according to gender determination procedure in the mass grave

In Figure 3, we explained the distribution of ages the site. According to the results of the present study, most of the victims were young people in the mass grave. The number of young bodies which were located between 20-29 years and 30-39 years were 53 (56.99%) and 19 (20.43%) respectively. While only 5 (5.38%) out of 93 were less than 20 years of all victims. Whereas 8 cases were more than 30 years and 8 cases could not be identified because of the degradations of the bones. Whereas, the stature of the victims was estimated according to their ages. The most prominent stature was around 160 t0 170 cm which was the expected result according to the evidence and testimonies (Figure 4).

Figure 3: Age distribution according to age determination procedure in mass grave
**Discussion**

Using special form prepared by ICMP, it was recorded the presented and absent bones for each body as much as possible because this work was very difficult and needed too much hard work as most of the bones were degenerated.

For the determination of gender, we tried to determine all, but some of the bodies were not appropriated for that determination. Most of the victims were males because the operation was to eliminate the Barzani clan, which had produced in Kurdish leaders since the 1930s, had been relocated to southern Iraq in 1975, but in 1980s, Saddam’s soldiers arrested up to 8,000 Barzani males and executed them in mass graves in the south region of Iraq.\(^\text{12}\)

Despite the usefulness of the technique applied for age identification, but the skeletal remnant was the challenge for age determination because the victims’ remnant bones determine the efficacy of the results.\(^\text{13}\) Therefore, some cases could not be identified because of the degradations of the bones.

**Conclusion**

The current investigation presented the anthropological identification for the victims in the mass grave in Busaya desert. The evidence confirmed that the mass grave belongs to the Barzani male victims arrested by Saddam’s army in the 1980s. Almost all victims were males and their age was estimated to be in a range of 20 to more than 40 years.

**References**

حكم الإبادة الجماعية في الشريعة الإسلامية والديانات الأخرى

القومية الكردية آمودجاً

Yaseen Kareem
Email address: yaseen.kareem@su.edu.krd

د. ياسين تحسين كريم البحركي
قسم اللغة العربية / كلية التربية الأساسية / جامعة صلاح الدين / أربيل

المقدمة

الحمد لله وكفى، والصلاة والسلام على النبي المصطفى، وعلى آل وصحبه أهل الفضل
والوفي أجمعين.

الإبادة الجماعية "genocide" أو "إبادة الجنس البشري" إلى جرائم الإبادة الجماعية التي تترتب بحق مجموعات معينة من البشر قد تتم تدمير وجودهم كلياً أو جزئياً على أساس إنتمائهم إلى مجموعة معيّنة أو عرق معين أو جنس أو دين.

وهذodef

هذodef

وهذه تكون بوسائل مختلفة وتغزو من الأعمال الخطيئة التي تهدف من وسيلة المجتمع لأنها تؤدي إلى إبادة أو اضطهاد كائنات إنسانية كلياً أو جزئياً بسبب طبيعتهم الوطنية أو العرقية أو الدينية أو السكانية.

ومما لا شك فيه أن هناك نماذج كثيرة للإبادة الجماعية عبر التاريخ قد أقدم عليها الطغاة والمستبدون حيث خلدوا عن طريقها مزبلة التاريخ تلعن البشرية أبد الدهر وتزور في التاريخ كي لا تنساه.

الإبادة الجماعية قد حدثت في القرن الدموي - القرن العشرين - بدأ من إبادة العرق وارتكاب فضاعات الجرائم في الحربين العالميتين الأول والثاني وما حدث للأرمن من مذابح، والإبادة الجماعية لليهود أوروبا على أيدي النازية في ألمانيا والتي تعتبر جريمة شنيعة حرفت أثرها العميق في الضمير الإنساني، هذا إضافة إلى ابادة الغجر والشواذ جنسياً والمعاقين جسدياً وعقلياً وابادة الفكر الشريقي واللبيري من الألمان وغيرهم ممن طالتهم يد النازية تحت ذراع أهلية كفاح الدم الألمان وإنحل لحلف الأمم الأوروبية - بدأ من إبادة المنظمة للجيش الأمريكي - وما حدث للشعب الكردي من إبادة منظمة على يد النظام البشري العراقي وغيره...

فقد حسنت هذه الجرائم أرتكبت في مخالفة صريحة لحقوق الإنسان من جانب وتفاقم مع معاقبة ومعاقبة ومعاقبة ومعاقبة ومعاقبة محكم وصادق عليها من قبل الأمم المتحدة والمعترف بها من معظم الدول التي أرتكبت جرائم الإبادة الجماعية.

ولا بد أن نبدأ النظر إلى إبادة الجنس البشري باعتبارها أولاً انتهاك للقانون الإنساني والبشري في مجموعة حيث يلزم الخروج من شروطها، وقد استثمرت هذه النظرة من خلال المنتظم الدولي الذي دعا إلى المبادئ الإنسانية النبيلة، كما دعا إلى الأدوات الإنسانية النبيلة، كما دعا إلى رأسها الإنسانية.

وقد تمحور هذا التوجه في ضرورة مراعاة العادات العربية والدراسات الإسلامية عند وقوع الحدث.

وهو كذلك أنه "إن الإبادة الجماعية للبشرية تزعم بشرية منذ بداية الإنسان على الأرض، فإن الأدوات السماوية أقررت لها من القواعد لما حد منها وبد من غلائها، فلا يزال الإنسان في حال إلقاء الفضل على النفس، ولا ينبغي له التشرع في القلق إذا لاحظ يوداد السلام، فإذا دارت رحى الحرب فلا تكون من القلوب الرحمة والإنسانية.".

وأن جميع الرسائل الإلهية التي أرسل الله بها الرسل لحليمة الناس إنما يقصد بها أمراً: أهدهم: تقرير الواقع في شأن الألوهة وما يصير عنها من إرسال الرسل، وتنزيل الأدب، والبحث...

والآخر: هو التدريب بالنسبة في مدارس كمال، ودمه بالحكام التشريعي الذي تصل بها أوساطهم، وتنبأ بها سمعتهم وبدة الطبيعية أن تتفق الرسائل كنها في الأسر الأول لأنها رجوع بالبشر إلى شيء متفرث ثابت لا يختلف العصور والأحوال، وأن ينصر الخلاف في دائرة المناهج...
والشرع التفصيلية التي تتغير بتغير الزمان، وتدرك الإنسان في مراحتها بحسب أطرافه وبيئاته ودرجة رقته في العقل والتفكير. ولذلك كان (الدين) واحداً على لسان كل رسول عينه، وكانت (الشريعة) مختلفة في تفاصيل الأحكام والتبعات (كل جعلنا منكم شرع ونهايات). (1)

 أهمية البحث
إن أهمية هذا البحث يتخصص في النقاط التالية:

- ندرة البحوث والدراسات التي تتناول هذا الموضوع على الرغم من مرور ما يقارب ثلاثين عاماً.
- يقدم البحث مساهمة للتعريف بمعنى الابادة الجماعية وسرد النصوص الواردة في الكتب السماوية واستبعاد الشكوك عنهم.
- يعتبر هذا البحث مساهمة علمية لتقييم معلومات عملية وتقنيات ومقترحات للجهات الحكومية ومنظمات المجتمع المدني في التعامل مع هذه القضية معاملة لائقة.

خطة البحث
تتكون خطة البحث من مقدمة وتمهيد وثلاث مباحث وخاتمة، ففي المبحث الأول تتطرق إلى حق الحياة في المنظور الإسلامي، والبحث الثاني: حكم القتل في الإسلام، والبحث الثالث: نصوص في الكتب السماوية حول القتل. والبحث الرابع: الأبعاد الاجتماعية الكبرى مختلف أدبها ومذاهبها ثم ختمت بخاتمة فيها التناجح والتوصيات.

والسلام عليكم ورحمة الله وبركاته

تمهيد:
إن استنباط حكم جريمة الإبادة الجماعية ينبغي أن يجري على ضوء المبادئ العامة التي حوارها القرآن والسنة، ذلك أن القرآن لم ينص على كافة الأحكام الجزائية بتفاصيلها التي ترتبط بوقائع لا متاحة في تعدادها وترتبط بمركز الزمان والمكان بما يؤثر على أختلاف هذه التفاصيل، التي تركت للمجتهدين في كل زمان ومكان ليستنبطوا أحكامها التزاماً بالضوابط الشرعية، وإنساناً مع الأحكام الكلية واقتصاد الشرع الحنيف.

وحنحن ننطلق من تلمس ما يمكن أن يكون منظوراً إسلامياً لجريمة الإبادة الجماعية من خلال ثوابت معينة في سنة الله في خلقه ومكانة الإنسان بين造物主ات والذي كرهه بقوله تعالى "ولقد كرمنا بني آدم وجعلناهم في الأرض لكتبين وهما البحر ورزقناهم من الطيبات وفضلناهم علي كثير ممن خلقنا تفضيلاً" (2) وحقيقته كون الإنسان خليفة الله في الأرض.

قال تعالى "وأذى ربك للملكيه أي جاعل في الأرض خليفة قال أجعل فيها من يسحد فيها ويسفك الدماء ونحن نسمح بحدك ونقضنا لك قال إلى أعلم مالا تعلمون (3)" والخلاف ينتقد في الأرض جعل له الله تعالى وظيفة أطباء بالإنسان وهو عدوية الأرض قبل تعالى " هو أشيك من الأرض واستعمار فيها (4) " وعمارة الإنسان للكون علي معنى بناء الحضارة لا تحققت من وجهة النظر الإسلامية، إلا إذا تم الالتزام بالقيم والمبادئ التي تضمنها الشرع في العلاقة الإنسانية سواء علي مستوي الفرد أوا على مستوي الجماعات، وفي هذا يقول الدكتور محمود السعيدي " والإسلام زيدة على يديه حقوق الإنسان علي وحدة النشأة ووحدة العقيدة ونظرية الاستحلال، فإنه دعم هذا التأسيس من خلال دعه الناس إلى الإضراف بالفضلاء لإبلاغ النفس الإنسانية إلى مرتبة تسميه بها علي همج الحيوانية ولذلك ذو الله سبحانه وتعالى الذين

1. الآية من سورة الأنعام (48) (1)
2. سورة الإسراء الآية 70 (2)
3. الآية في سورة البقرة الآية 30 (3)
4. الآية في سورة هود الآية 61 (4)
لم يتخلووا بخلق الإنسان فقال تعالى "لهم قلوب لا يفقهون بها ولهم أعين لا يبصرون بها ولهم آذان لا يسمعون بها أولئك كالأنعام بل هم أضل أولئك هم الغافلون (5/6)

المبحث الأول: حق الحياة في المنظور الإسلامي

يعتبر حق الحياة أول الحقوق الأساسية وأهمها بين حقوق الإنسان، وهو الحق الأول للإنسان، وبعده تبدأ سائر الحقوق، وعند وجوده تطبق بقية الحقوق، وعند انتهائه تنعدم الحقوق.

وحق الحياة هو حق للإنسان في الظاهر، ولكنه في الحقيقة منحة من الله تعالى الخالق الباري، وليس للإنسان فضل في إيجاده، وكل اعتداء عليه يعتبر جريمة في نظر الإسلام (7).

وحق الحياة في النظم وال конт рол في النظرية الإسلامية، ويجب حفظه ورعايته وعدم الاعتداء عليه، قال رسول الله صلى الله عليه وسلم: "كل المسلم على المسلم حرام: دمه وماله وعرضه" (8).

وجاء في خطبة الوداع: "إن دماءكم وأموالكم وأعراضكم حرام عليكم كحرمة يومكم هذا، في شهركم هذا، في بلدكم هذا" (9).

وحق الحياة مكفول في الشريعة لكل إنسان حتى للجنين، ويجب على سائر الأفراد أولاً، والمجتمع ثانياً، والدولة ثالثاً، حماية هذا الحق من كل اعتداء، مع وجوب تأمين الوسائل اللازمة لضمانه، من الغذاء والماء والدواء والأمن، وعدم الانحراف. وينبني على ذلك عدة أحكام شرعية نذكرها باختصار شديد:

1. تحريم قتل الإنسان: إلا لأسباب محددة، لأن حق الحياة مصون ومقدس بالنصوص القاطعة والمعتقة، لما ورد في الحديثين السابقين، ولقوله تعالى: (ولا تقتلوا الناس الذين خلقهم اللَّه إلَّا بِحَقٍّ) (الأنعام: 151).

2. حكم القصاص: يحق للإنسان حق الحياة والموت على الأفراد، وأنجبابه وابنائه، يعني أي شخص يحق له أن يقتل في سبيل الإسلام أو في سبيل الحق.

3. حكم القصاص للجنين: إذا وookeت إحدى الجنين أو وُلدت، فيجب على الثائر أن يصنع حق الحياة وحق المومي، ويدفع أمواله ويرضو قضائه.

4. فحق الحياة حق مقدس ومحترم في نظر الشريعة الإسلامية، ويجب حفظه ورعايته وعدم الاعتداء عليه.

الآية في سورة الأعراف الآية 179.

(5) حقوق الإنسان في الإسلام، حمودة السعفي، مشار إليه في حقوق الإنسان في الإسلام، عبد الله الطليف بن سعيد الغامدي، أكاديمية نافذ العربي للعلوم الإنسانية، 2000 (ص 26).

(6) حقوق الإنسان في الإسلام، حمودة السعفي، مشار إليه في حقوق الإنسان في الإسلام، عبد الله الطليف بن سعيد الغامدي، أكاديمية نافذ العربي للعلوم الإنسانية، 2000 (ص 26).

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4. تحريم المبارزة: وهي الاقتتال بين شخصين لإثبات حق، أو لدفع العار والإهانة، لقوله صلى الله عليه وسلم: «إذا التقى المسلمان بسيفيهما فالقاتل والمقتول في النار، قالوا: يا رسول الله، ما بال المقتول؟ قال: كان حريصًا على قتل صاحبه» (14).

5. تحريم الإجهاض: وهو قتل الجنين في الرحم، فإن حصل عمدًا، وبعداد، وجاء في القرآن، وهي نصف عصر الدنيا، وقد نزل حيًا ثم مات فتجب فيه الدية كاملة.

6. إباحة المحظورات للحفاظ على الحياة: وذلك باتفاق الفقهاء للقاعدة "الضرورات تبيح المحظورات".

7. حرمة إفناء النوع البشري: وذلك عندما يستمر القتال بين قبائل أو شعوب، أو تكتل دولي ضد آخر، ضد شعب أو أمة، وذلك حرص الإسلام على الحفاظ على الحياة. وللإنسان حضن في عصرنا الحاضر، الذي يشهد انتشار الأسلحة القاسية، والإبادة الجماعية، والمجازر الجماعية، والمجازر الجماعية.

ومن هذا المنطلق حرم جمهور العلماء فكرة تحديد النسل، والقضاء على الذرية، ولم يسمحوا إلا في بعض الحالات المحددة. ويرجع هذا إلى الحفاظ على الحياة، ويجوب المحافظة على الكرامة الإنسانية، لأن الإنسان جسد فيه الحياة، وروح.
فتكون من أصحاب النار وذلك جزاء الظالمين. فطوعت له نفسه قتل أخيه فقتله فأصبح من الخاسرين (15) وتدل هذه الآيات على عدة معان هي أن الإحجام عن القتل إنما هو من مخافة الله و من ثم ضرب الخسائرين، وأن القتل أثم يتحق عن الذنبين في النار وأن من يرتكبه يكون من الخاسرين، كان ذلك كله في وقت لم تكن فيه دول أو حكومات، ومع ذلك شرع الله لبشر منذ ذلك الحين تحريم القتل.

ثم جاء القرآن بعد ذلك ليشير إلى حكم قتل الإنسان للإنسان، يتمثل في حكم عام لا يخص صفه معينة في الخلافة أو القتل، وإنما هو خطاب موجه إلى الكافة، قال تعالى "... أنه من قتل نفساً بغير نفس أو فساد في الأرض فكأنما قتل الناس جميعاً ومن أحياها فكأنما أحيا الناس جميعاً" (16).

وروي عن ابن عباس رضي الله عنهما أنه قتل قتيل في المدينة علي عهد الرسول صلى الله عليه وسلم ولم يعرف من قتله فصعد الرسول صلى الله عليه وسلم إلى المنبر وقال "يا أهل الناس، يقتل قتيل وانا فيكم ولا يعرف من قتله! لو أن مجتمع أهل السماء والأرض على قتل أمراء لعذبهم الله إلا أن يفعل ما شاء" (17).

وغبني عن البيان أن هذا الحكم ينصرف إلى الناس كافة يستوي في ذلك أن يكونوا مسلمين أو غير مسلمين، بل إن الرسول صلى الله عليه وسلم قد خص المعاهدين وأهل الدين بحدودين مفادهما أن "من قتل معاذناً لم يزكوا رابطاً للجنة وإن ربحهم توحيد من مسيرة أربعين عاماً." (18) "ومن قتل قتيلاً من أهل النبوة جرح الله عليه الجنة" (19).

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وغبني عن البيان أن هذا الحكم ينصرف إلى الناس كافة يستوي في ذلك أن يكونوا مسلمين أو غير مسلمين، بل إن الرسول صلى الله عليه وسلم قد خص المعاهدين وأهل الدين بحدودين مفادهما أن "من قتل معاذناً لم يزكوا رابطاً للجنة وإن ربحهم توحيد من مسيرة أربعين عاماً." (18) "ومن قتل قتيلاً من أهل النبوة جرح الله عليه الجنة" (19).

ثم جاء القرآن بعد ذلك ليشير إلى حكم قتل الإنسان للإنسان، يتمثل في حكم عام لا يخص صفه معينة في الخلافة أو القتل، وإنما هو خطاب موجه إلى الكافة، قال تعالى "... أنه من قتل نفساً بغير نفس أو فساد في الأرض فكأنما قتل الناس جميعاً ومن أحياها فكأنما أحيا الناس جميعاً" (16).

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وفي الآيات المذكورة حدد الشارع حكم القتل الخطأ والقتل المتعمد في الدنيا ففي الحالة الأولى تكون الدية والعتق إلا أن يعفي له من ولي المقتول خضوع النبأ، أما القتل العمد فيتمثل بالقصاص فيقتل القاتل حرًا كان أو عبدًا أو أنيث ويستغرط تمتام القاتل والمقتول.

إلا أن يقبل ولي المقتول 동ية أو أن يعفو عن قتل، ثم جاء الأمر بالآسر يسرف ولي المقتول ظلماً في القتل فلا يأخذ أجازة أخر غير القاتل بجرئه هذا الآسر، وله أن يعفو بأن يأخذ العتق.

والأحكام السابقة تشير إلى التحريم القاطع للإبادة الجماعية حتى ولو في مواجهة شخص قاتل ينتهي إلى جماعة معينة فيم إبادة الجماعة انتقامًا من القاتل فذلك يخالف كافة الأحكام الواردة في هذا الشأن.

المبحث الثالث: القتل في الأديان السماوية الأخرى

وقد نشأت هذه الجريمة منذ وجدت الجماعة وحدث بين أفرادها تعارض الرغبات والشهوات. وورد ذكرها في جميع الشرعات والديانات القديمة، ونص فيها على عقوبة مقترفيها بجزاء يختلف شدة وضعفاً باختلاف درجة الجماعة من رقي واضمحلال.

أولاً: القتل في النبأ:

فرقت النبأبين الأحوال المختلفة لجريمة القتل وبين العبد منها وغير العبد، ورسمت لكل نوع عقوبة خاصة تتناسب مع درجتها في بالإمام. ومن نصوصها: (من ضرب، إنسانًا فمات فليقتل قتلاً؛ فإن لم يتعمد قتله بل أوقعه الله في يده فسأجعل له موضعًا يهرب منه."

وإذا بغي رجل على آخر قتلته أذىً؛ فمن قدم مذبحه يأخذه ليقتل. ومن ضرب أباه أو أمه يقتل قتلاً. وإذا تخاصر رجلان جريمة فوراً، فإن قام وتمشي خارجاً يكون الضارب بريئاً إلى أن يعوضه عطلته، وينفق على شفائه. وإن حصلت أذىً فعطي نفساً بنفس وعيناً بعين وسناً بسن ويداً بيد ورجلاً برجل وكياً بكي وجرحاً

بجرح وجرحاء. (25)

ومن هذه النصوص يظهر للباحث أن شريعة اليهود تنص على القصاص في كل الحالات دون ذكر العفو عن بيئة حالة منها.

ثالثاً: القتل في الإنجيل:

فأما العهد الجديد، فائده أنه يحرم القتل وينهى عنه ضمن الوصايا العشر. ففي العهد القديم، نقرأ(26)

ويجلي لنا العهد الجديد كيف أن قايين قتل أخاه هابيل وكيف أن الله عاقب قايين على هذه الجريمة بقتل升高 آخه. وحدث إذ كانا في الحقل أن قايين قام على هابيل أخيه وقتله. فقال الزبّ"أين هابيل أخوك؟" فقال: "لا أعلم! أحارس أخوي؟" فقال: "ماذا فعلت؟ صوتك أخيك صارخٌ إليني من الأرض. فآن ألحون أنت من الأرض التي تحدثها أنا؟" فقال قايين: "أذنبني أعذبني. فقال: 

وكلم قايين هابيل أخاه. وحدث إذ كانا في الحقل أن قايين قام على هابيل أخيه وقتله. فقال الزبّ: "أين هابيل أخوك؟" فقال: "لا أعلم! أحارس أخوي؟" فقال: "ماذا فعلت؟ صوتك أخيك صارخٌ إليني من الأرض. فآن ألحون أنت من الأرض التي تحدثها أنا؟" فقال قايين: "أذنبني أعذبني. فقال: 

بجرح وجرحاء. (25)

(25) الكتاب المقدس/ العهد القديم . الاصحاح الحادي والعشرون من سفر الخروج
(26) (الخروج 13:20)
ولم يكتف العهد القديم بتحريم القتل، وإنما فرض عقوبة مكافئة له وهي القتل حداً، فمن قتل يقتل.
وفي العهد الجديد نقرأ: "أَخَذَتْهُ الْأَمْرُ وَلَيْتُمُّوهُمْ عَذَابًا طَالِعًا".
وأما العهد الجديد، فقد نقل عن السيد المسيح تأكيده لحرمة القتل ولحد القتل.
ففي العهد الجديد نقرأ: "قَدْ سَمِعْتُمْ أَنَّهُ قِيلَ لِلْقُدَمَاءِ: لاَ تَقْتُلْ، وَمَنْ قَتَلَ يَكُونُ مُسْتَوْجِبَ الْحُكْمِ، وَلَيْسَ أَنَّ الْأَمْرَ يَقْتَلَ، وَلَكِنَّ الْأَمْرَ يُقْتَلَ بِهِ".
وفقاً للعهد الجديد، لم يكتف السيد المسيح بتحريم القتل وإنما حرم ما يؤدي غالباً إلى ارتكاب جرمة القتل وهي الغضب واعتبره مستوجبياً لحد القتل. ففي العهد الجديد نقرأ: "أَخَذَتْهُ الْأَمْرُ وَلَيْتُمُّوهُمْ عَذَابًا طَالِعًا".
وأما ذلك، فالنَّارُ حِيْثَ نَقْلَتْهُ الْأَمْرُ وَلَيْتُمُّوهُمْ عَذَابًا طَالِعًا.
وأما القتل عند البدو:
كان العرب قبل الإسلام أمة فطرية تعيش على البداوة بنظامها وعاداتها الخاصة.
ولكن بالنسبة لما جبلت عليه العرب من الحمية الجاهلية والعصبية، وكلفهم بالأخذ بالثأر أسرفوا في القصاص وتمادوا فيه فأصبحت الجماعة تقتل بالواحد دون النظر إلى قواعد العدل والإنصاف.
وقد دخل على هذا النظام عدة تغييرات انتهت بتدخل الحكومة، وتفيد، كما هو الحال عليه في القوانين الحديثة.

(27) سيقنت تخرجه
(28) متى 21:5
(29) متى 22:5
(30) متى 22:5
(31) القتل في الشرائع: مجلة الرسالة العدد 7647.
المبحث الرابع: الإبادة الجماعية التي شاهدها القومية الكردية

عندما حاول الكرد المطلوري بحقوقهم المشروعة سلكت الدول المجاورة سلوك المحللين في قهرهم وصهرهم لهم من خلال الحبس والتعذيب والتهجير القسري الجماعي، والقتل الجماعي، واستخدام الأسلحة الكيميائية، وأسلحة الدمار الشامل، كان النظام الأكثر سوءً هو النظام العراقي الذي نفذ الإبادة الجماعية وقتل مئات الآلاف من الكرد ودمّر الآلاف القرى، الذين بقوا منهم على الحياة عانوا من تغيرات وراثية مثل السرطان والأمراض القلبية والرجوية الناتجة عن الإصابة بتلك الأسلحة القاتلة وذذا ما سبب كوارث وفائض كبرى للكرد يستوجب فضحها ومحاكمة مرتقبة وتعويض ضحاياها.

كوردستان الجنوبية (كوردستان _ العراق)

قتل جماعي ومذبحة بشريّة في ظل نظام صدام حسين تطور الاعتدام في العراق إلى فن جميل تضمن القتل الجماعي والمذبحة بساهيتها المختلفة. السلاح الكيميائي ضد المدنيين الاعتدام الجماعي قد الناس أحياء او قتلى من الأرجل باوزان تقلية ورميهم احياء في النهر أو تسليهم أو تقطن بالطائرات أو الاقل كما علق عليه بحذاء السياسات. بأنه بداية عام 1978 مدققاً قرية أكثر من 500000000 من السكان العراقي في الوقت نفسه وجد 150000 مهجر كوردياً في المناطق العراقية. وبموجب لجنة سويدية لحقوق الإنسان الكوردي في ستوكهولم في عام 1988، وقعت مذابح الايام التي تجاوزت تغييرات من التذببات الامريكا في اليمن والغرب الشرقي 1989 من واقع. الانتقادات المذكورة والختام في التقارير الميدانية والصحفي والمساعدات بتطوير الحركات الانفصالية الكردية وعندما حاول الكرد المطالبة بحقوقهم المشروعة سلكت الدول المجاورة سلوك المحتلين في قهرهم وصهرهم لهم من خلال الحبس والتعذيب والتهجير القسري الجماعي، والقتل الجماعي، واستخدام الأسلحة الكيميائية، وأسلحة الدمار الشامل، كان النظام الأكثر سوءً هو النظام العراقي الذي نفذ الإبادة الجماعية وقتل مئات الآلاف من الكرد ودمّر الآلاف القرى، الذين بقوا منهم على الحياة عانوا من تغيرات وراثية مثل السرطان والأمراض القلبية والرجوية الناتجة عن الإصابة بتلك الأسلحة القاتلة وذذا ما سبب كوارث وفائض كبرى للكرد يستوجب فضحها ومحاكمة مرتقبة وتعويض ضحاياها.

0800 كورد مدني بارزاني

في 31 تموز اختفى 8000 كورد مدني دون أثر عندما حاصرت القوات العراقية قرى حرير ديانا، وفشت وحربة، واقامت معارك اعتقال تلك التي أقيمت من قبل النازية الألمانية خلال الحرب العالمية، قبض في ليلة مظلمة على 8000 جرح مدني في موقعة الركاب ( العراق المحيط ) بارزاني في السهل 1980، لا يزالون بدون أثر.

ذكرت احدهى الأزمات لتقول - حاولت ان تمسك بابن الأصغر، والذي كان صغيراً ورمياً، تمشاركة الأصدقاء: اختتمت البائعان الثلاث الآخرون، وهو رجل دعوبي احتفظ بها، فقالوا: إذا طلقت باكثر من هذا سطح البقر عالية، ثم ضربوني في صدرل بخاصة البندقية اخذوا الولد وكان في الصف الخامس الابتدائي.

وكان سبب اعتقال أولئك الناس فقط صلتهم بعشيره القائد الكرد مهدى بارزاني

عمليات الإبادة 1988

بدأ النظام العراق صدام حسين 1988 حملة عسكرية ضد الكرد سبيت بالانفصال وكالة (الانفصال) اسم سورة قرآنية استخدمها المسلمون في غزواتهم ضد الكفار في بداية ظهور الإسلام إلا أنها تكررت في العراق لتنفذ ضد الكرد فقد نفدت عمليات الانفال طوال سنة 1988 حيث تعدت تلك العمليات لتمس حملة الانفال 1 لغة 8. اختفى من على الأرض أكثر من 182000 كورد في في قرى جماعية ومداهمات 8938 قرية وحسن مع الأرض وكذلك 18 مدينة متوسطة الحجم، وازيلت أرياف بحجم مساحة لبنان أي ما يعادل 25000 كيلومتر مربع. وصلوا في عمليات الانفال السلاح الكيميائي ومداهمات الابار، المدارس، المستشفيات والمصابين، تحولت ثلاث مساحة كوردستان الجنوبية إلى أرض قرار، وهي حوالي مليون شر يتد مواي وفي مقدمتهم مقاطعة بيديين التي كانت حركة مقاومة الكرد فيها تمتلك قبضتها القوية جداً وكذلك في السهل حول كركوك واربيل.
وضع اغلبية المرحلتين والذين قدروا بحوالي 800000 شخص في مسكتات اقتصادية مؤقتة طوال الطريق الزمني بين كركوك – السليمانية – أربيل في امكاني يمكن السيطرة عليهم بسهولة وأجبر الآخرون للاستيطان في الصحارى قرب الحدود الأردنية والعربية السعودية.

استخدام الأسلحة الكيمياوية

واجباً المجتمع الكردي مخاطر كبيرة والأسلحة الكيمياوية كانت الأكثر خطورة. ان الاستخدام المتكرر لهذه الأسلحة ضد الكرد أدى إلى القتل الجماعي مرات عديدة. وكانت الدولة التي تحتل بصورة مشتركة كوردستان قد بدأت بالتصام التي تصنف الأسلحة الكيمياوية. بالنسبة للعراق، وكيف اننا لعدم وجود كيا فسران لاستخدام هذه الأسلحة ضدهم بشكل جماعي ومتكرر. وكانت تلك الدول تعرف أهمية حقوق الإنسان ولكنها في وقت نفسه تعرف ان التجارة من التحول على العلاقات الدولية وارتجاز لعدم وجود راي عام أو أعلام مؤثر للذين يمكنهم التأثير على سياسة الدولة في هذه الدول تهمل النقد الموجه اليوم من قبل منظمات حقوق الإنسان.

قتل 5000 من الكرد المدنيين الغاز الكيمياوي

إن اليوم الأكثر سوءاً في تاريخ البشرية كانت استخدام النظام العراقي الأسلحة الكيمياوية ضد الكرد المدنيين تعرض الكرد لحملات قصف قاسية بالانفام الكيمياوي نسواها كانت على القرى الجغرافية من الحدود الإيرانية والتركية. بين نisan 1987 وآيار 1988 استخدمت الأسلحة الكيمياوية أي الغازات السامة في أكثر من 60 حالة ضدهم في كل من حلبجة وباريس ومناطق كاني ماسى التي شملت أيضاً قرى أشورية وكلدانية مواجحة.

السابع عشر من الآذار 1988 هو اليوم الأكثر أصدامة ودويًّا الذي أحرقته ومحبوه فيه ب szer الذبابة ونافع ومناطق الكردية حلبجة.

كان يوماً حيث فيه زيال انظمة لقناب الكيمياوية على حلبجة في هجوم غازات السامة قتل 5000 كوري مدني وجرحت حوالي 10000 في دقائق معدودة وكان معظمهم من النساء والأطفال.

في الواقع كانت هذه العملية واحدة من أكبر وأكثر عمليات القتل الجماعي تنظيماً في التاريخ الحديث والشهداء العيان الذين حالفهم الحظ وقروا على قيد الحياة وعاشوا تلك اللحظات الرهيبة. واي التي تتوفى الطائرات العراقية حمولتها القتالية والمسيمة على المدينة. يعودون هنا على ماضي عصر ذات يوم بدأ موجودين في المأزق يتحمل حيلة النزاع والبصل غير قادرين على منع دخول الغاز، وينهوا في الخارج على الشوارع.

قال أحدهم جنباً إلى جنب والذين موجودة في كل مكان على الشوارع حولت كومة على اعتاب الأبواب وفوق مقاوم السيارات والأحياء منهم يتعثرن وهم يضحكون بشكل هستري قبل أن ينهاروا... (32)

خاتمة

بعد تمام هذا البحث أشكر الله تبارك وتعالى على ما منّ به عليه من نعمه التي لا تعد ولا ت.getCount، ومنها ما يسر لي من إنهاء هذا البحث، والذي أحب أن أختمه بذكر أهم ما توصلت إليه من نتائج ونتناول في الأعلى:

1- إن الشريعة الإسلامية حفظت نفس الإنسان من أن تقتل بغير حق، إذا أوجب القصاص على من اقترف جريمة القتل العمد إذا توفرت شروط القصاص، وهذا نجح بأن يؤثر للناس الأمن والاطمئنان؛ لأن من أراد القتل إذا عرف أن يقص منه فإنه يتمتع من هذا الفعل.

(32) الاياب عامية للشعب الكردي ( سمير مصطفى عقراوي ) ( ص 93 )
ونجد أن مبادئ الشريعة الإسلامية وقواعدها قد تضمنتها وتجاوزتها إلى ما يحمي الجماعة البشرية أيا كانت مكوناتها، بل إذا تحقق تداخلًا بين ما تضمنته أحكام الاتفاقية مع أحكام جرائم أخرى تضمنتها مواقف أخرى على نحو ما قد يورث الخطأ بين جرائم عدة على سبيل المثال بين جريمة الإبادة الجماعية والجرائم ضد الإنسانية، وعلى الرغم من أن هذا التقسم ليس واضح في الشريعة الإسلامية إلا أن نطاق الحماية يتضمنها جميعا في الشرع الإسلامي على نحو لا يفوت منه عمل من الأعمال التي تكون هذه الجرائم أو تلك وفي ذلك كلمة حكمة بالغة.

وقضية اتحاد الدين على اختلاف الرسل قضية يقررها القرآن الكريم في كثير من المواضع، ويكونها على أساليب مختلفة، تستقر في النفس، وتؤمن بها القلوب، ويبرّر الناس أنهم جميعا على كلمة سواء، وأنه لا تميز للنفر والتنافر والقاسبات.

يقول الله تعالى: (إِنَّ الَّذِينَ آمَنُوا وَالَّذِينَ هَادُوا وَالصَّابِئِينَ مَنْ آمَنَ بِاللَّهِ وَالْيَوْمِ الآخِرِ وَعَمِلَ صَالِحًا فَلَهُمْ أَجْرُهُمْ عِنْدَ رَبِّهِمْ وَلاَ خَوْفٌ عَلَيْهِمْ وَلاَ هُمْ يَحْزَنُونَ) (33)

وهذه الآية تفيد أن أصول الدين ثلاثة:

1- الإمام بالله على وجه الصحيح الذي بين في آيات أخرى، بأن يشهد الإنسان أن لا إله إلا الله، ولا يعترف إلا إياه، ولا يتوكل إلا عليه، ولا يؤمن ولا يعادي إلا فيه، ولا يعمل إلا لوجهه...

2- الإمام بالله الآخر، بأن يعتقد أن الله سبحانه الناس من الأحداث لباحهم عليهم ما قدموا من خير أو شر فيكفهن لمحسن على إحسانه، ويجزي المسيء بإساءته.

3- العمل الصحيح الذي من شأنه أن يعد المجتمع البشري ويزيل الشرور والفساد، وينشر الطمأنينة والأمان، ويمكن كل إنسان من أداء واجبه وأخذ حقه على وجه سليم يقضي إلى نزاع، ولا يؤدي إلى ظلم.

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3. التشريع الجنائي الإسلامي، عبد القادر عودة
4. تفسير ابن عربي.
5. جامع البيان عن تأويل آي القرآن، محمد بن جبرير الطبري.
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8. حقوق الإنسان في الإسلام، عبد الله محمد بن عبد الحليم.
9. حقوق الإنسان في الإسلام، حمودة السعفي.
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11. الأصحاح:_rule.
12. في ظلال القرآن، سيد قطب.
13. الفعل في الفيتال: مجلة الرسالة العدد 764.
14. الكتاب المقدس.
15. ماماس التأويل: محمد جمال الدين القاسمي.
Abstract

Background and objective: Genocide means the destruction of the basic life of innocent people. After the division, the Kurdish people have not enjoyed any freedom or even a low level of minority rights; ethnic cleansing and genocide. The southern part of Kurdistan, like other areas of Kurdistan, faced under the ongoing oppression, ethnic cleansing and other genocide. The ethnic cleansing policy increased after the Arab nationalist Baathists took power in 1968. The objectives of the study are to identify data about Kurdish genocide from different resources and historical documentation.

Methods: This retrospective study was conducted in Erbil governorate. Data was collected from different resources with the support ministry of Anfal and martyrs in the Kurdistan Region from 1st Jun to 1st September 2018. The approval was taken from an ethical and scientific committee in the college of nursing, and permission was taken from a ministry of Anfal and martyrs in Erbil. The data were analyzed using different methods of statistical analysis.

Results: The Kurdish genocide was begun in early times and especially from 1968 to 1988. Chemical bombardment according to governorate included (Erbil 17.68%, Sulaymaniyah 42.77%, Duhok 7.13%, Kirkuk 22.37%, and others 10.27%). The Anfal campaign included (Erbil 16.35%, Sulaymaniyah 30.74%, Duhok 6.59%, and others 10.3%). Other results indicated that there was Kurdish genocide according to (ethnic, religion, sex, age, and family members) and the Anfal campaign had been done in 8 phases in (23-02-1988 to 6-09-1988). There was Yazidi genocide by the Islamic State in Iraq and Syria in 2014.

Conclusion: All documents that we have been used in the study revealed that the Kurdish genocide had begun in early times as in 1952, 1961 and especially after the Arab nationalist Baathists took power in 1968. Continue to 1988 and over as Yazidi genocide by Islamic State in Iraq and Syria (ISIS) in 2014. Kurdish genocide was done in different military Campaign in Kurdistan.

Keywords: Kurd, Genocide, Anfal, Retrospective Study, Documentation.

Introduction

The Kurdish people included a large nation without their own government; their areas were divided between four countries (Turkey, Iran, Iraq, and Syria). The division of their country done without their wishes or desire after the First World War. After that, the Kurdish people faced oppression, discrimination, ethnic cleansing and genocide. The southern area of Kurdistan, which was officially linked to Iraq in 1925, like other areas of Kurdistan faced ethnic cleansing and genocide by the Iraqi Arab nationalist Baathists took power in 1968 followed systematic assimilation, Arabization and ethnic cleansing policy against Kurdish people in the Kurdish territory. In summer 1987, Saddam Hussein decided to bring an end to all the lives in the Kurdish rural areas and other places. His first stage was to install his cousin Ali Hassan al-Majid, “Chemical Ali,” as the Secretary General of the Northern Bureau Command. He gave him absolute power over all state military and civilian units in the
In 1987-1988 Chemical Ali, ordered heavy bombardment with every kind of heavy artillery, including chemical poison, against all the prohibited areas with the purpose of killing the greatest number of Kurds possible.\textsuperscript{6,7}

The main genocide started by cleansing of the Faili Kurds in the 1970s and 1980s; the Arabization and cleansing of Yazidi Kurds; the mass killings of around 8000 Barzani Kurds in 1983; the chemical attacks on Halabja in 1988, which killed 5000 people; the ethnic cleansing during the Anfal genocidal campaign in 1988 by eight military phases, which resulted in the disappearance of approximately 182,000 Kurds and the destruction of around 4000 Kurdish villages and finally Yazidian genocide During the Daesh related war in Iraq in 2014.\textsuperscript{8} The ministry of martyrs and Anfal affairs in KRG organized and conducted many conferences about Kurdish genocide in Iraqi and outside of Iraq, in spite of these conducting many meetings, seminar and by supporting many studies also continuous attempts by KRQ and Iraq to support and approved Kurdish genocide by International Criminal Court (ICC), European Parliament, UN and other international organizations in human rights.\textsuperscript{9,10} When we see those backset that happened to the Kurdish peoples, we conducted a retrospective study to collect and organize those data as a documentary study for enrichment history of Kurdish genocide and included some diseases that occurred after Kurdish genocide. This study aimed to identify and discover historically Kurdish genocide Campaigns in different areas and different years that happened in the Kurdistan Region / Iraq.

Subjects and Methods

Design and setting

This retrospective study was conducted in Erbil–Governorate, supported by the ministry of Anal and martyrs.

Participants

All the genocide campaigns that occurred in the southern area of Kurdistan and Iraq were included in this study. We received information from different resources with co-operation and support of the Ministry of Anfal and Martyr in Kurdistan Region Government (KRG).

Tool

Tools of the study included different forms and tables related to collecting the data about victims, death, places, and type of genocide. Time of data collection began from 1-6-2018 to 1-9-2018. There were some difficulties in obtaining data and information about the Kurdish genocide.

Data collection

Data were collected from the different resources with co-operation and support of the ministry of Anfal and martyr in KRG (Kurdistan Region Government), from 1\textsuperscript{st} Jun to 1\textsuperscript{st} September 2018.

Ethical aspects

The approval was taken from the ethical and scientific committee in the college and permission was taken from the ministry of Anal and martyrs. All documents were organized as data in tables for presentation on conference day on 7-8 September 2018.

Data analysis

Organized all documents and data in a table for presentation on conference day on 7-8 September 2018. Data were analyzed by using different methods of statistical analysis.0

Results

Table 1 shows the number of Kurdish civilians was killed and disappear during genocide campaigns against Kurdish civilians in Kurdistan from early time as 1963 to 1988. The large number that appears in this table was the chemical bombardment of the villages in the Bahdinan district and Barzan in 09/ 08/ 1988 were 2980 civilians also killed in the 11/ 06/ 1963 during
destroy of villages that killed and disappear over 2000 civilian. The total number of Kurdish was genocide from 1963 to 1988 were over 6944.

**Table 1:** Different genocide campaigns against Kurdish civilians in Kurdistan not introduced by Iraqi higher court of Criminal

<table>
<thead>
<tr>
<th>Genocide Campaigns</th>
<th>Location</th>
<th>Date</th>
<th>No. of civilians killed or lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curfew of the city of Suleimaniah</td>
<td>Suleimaniah</td>
<td>09/07/1963</td>
<td>83 killed</td>
</tr>
<tr>
<td>Killing civilians and destroyed of villages</td>
<td>All Kurdistan</td>
<td>11/06/1963</td>
<td>2000 killed</td>
</tr>
<tr>
<td>Shot and hanged in Koya City</td>
<td>Erbil</td>
<td>07/09/1963</td>
<td>20 killed</td>
</tr>
<tr>
<td>Mass killing Surria village and Dakan Cave in</td>
<td>Duhok</td>
<td>18/08/1969</td>
<td>109 killed</td>
</tr>
<tr>
<td>Bombardment of Kaladiza city and Halabja City</td>
<td>Sulaimani</td>
<td>26/04/1974</td>
<td>413 injured 250 killed</td>
</tr>
<tr>
<td>Hanged of Kurdish teenagers</td>
<td>Sulaimani</td>
<td>1985</td>
<td>300 killed</td>
</tr>
<tr>
<td>Chemical bombardment of villages: Qzlar, Sangar, Mawlaka, Haldan, Kargullu, Kani Tu, Awazhe, Serwan, Nulchaka, Chnarya.</td>
<td>Sulaimani</td>
<td>Apr 1987</td>
<td>80 killed</td>
</tr>
<tr>
<td>Chemical bombardment of Dolli Balisan, Qarakh, Shekh Wasanan, Malakh Gorasher, Kandol, Bardok, Ble, Tahe, Nazanin, Balisan</td>
<td>Erbil</td>
<td>Apr-May 1987</td>
<td>405 killed</td>
</tr>
<tr>
<td>Chemical bombardment of many villages in Duhok district</td>
<td>Duhok</td>
<td>01/07/1987</td>
<td>12 killed</td>
</tr>
<tr>
<td>Chemical bombardment of villages Sargallo, Yakhsamar, Gwezala, Dolly Jafayati</td>
<td>Sulaimani</td>
<td>26-28/02/1988</td>
<td>12 killed</td>
</tr>
<tr>
<td>Chemical bombardment of villages – Siewsenan Shanakhe and district</td>
<td>Sulaimani</td>
<td>23/03/1988</td>
<td>93 killed</td>
</tr>
<tr>
<td>Chemical bombardment of Shekh-wassan and surrounding villages - Siewseanan, Walyan</td>
<td>Erbil</td>
<td>23/04/1988</td>
<td>40 killed</td>
</tr>
<tr>
<td>Chemical bombardment of villages – Goptapa, Askar, Maylan, Sarchema, Shkehanm, kalasar, Chamy Rezan, Qochlakh and Zare</td>
<td>Kirkuk</td>
<td>03/05/1988</td>
<td>560 killed</td>
</tr>
<tr>
<td>Chemical bombardment of the villages in the Bahdinan district and Barzanz</td>
<td>Duhok</td>
<td>09/08/1988</td>
<td>2980 killed</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>All Kurdistan governorates</td>
<td>1963 to 1988</td>
<td>Over 6944 killed and disappear</td>
</tr>
</tbody>
</table>

Table 2 explores the different genocides of Kurdish people that Introduced by Iraqi higher court of Criminal. Anfal and Mass killings of the Barzanian in at 1983 were 8000 civilians killed and disappear. Displacement, absence and killing over 20000 of Kurdish Fayli from 1980 to 2003. Chemical bombardment of Halabja city in 16-3-1988 were 5000 died and 7000 injured, finally, Anfal campaign that performed in 8 phases at All Kurdistan’s governorates and districts were 182000 civilians lost and 4500 villages destroyed.
Table 2: Different Genocide of Kurdish people Introduced by Iraqi higher court of Criminal

<table>
<thead>
<tr>
<th>Genocide Campaigns</th>
<th>Name of Governorate of Genocide</th>
<th>Year from-to</th>
<th>Number of Victims</th>
<th>Introduced by Iraqi Higher Court of Criminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anfal and Mass killings of the Barzanian</td>
<td>Erbil Governorates and districts</td>
<td>31/07/1983</td>
<td>8000 civilians were killed and disappeared</td>
<td>20/06/2011</td>
</tr>
<tr>
<td>Displacement, absence and killing of Kurdish Fayli</td>
<td>Diyala Governorates and districts</td>
<td>1980 to 2003</td>
<td>Over 20000</td>
<td>10/05/2011</td>
</tr>
<tr>
<td>Chemical bombardment of Halabja city</td>
<td>Sulaimani</td>
<td>16/03/1988</td>
<td>5000 died and 7000 injured</td>
<td>2005</td>
</tr>
<tr>
<td>The Anfal campaign was performed in 8 phases</td>
<td>All Kurdistan’s governorates and districts</td>
<td>1988 to 21/02/1998</td>
<td>182000 civilians lost and 4500</td>
<td>Introduced</td>
</tr>
</tbody>
</table>

Table 3 focuses on the displaced Kurdish people and the destroyed villages of all Kurdistan in different governorates and districts at the different years that are not introduced by Iraqi higher court of Criminal. The total number of Kurdish people that were displaced from their dwell was 1443000 and general villages that were destroyed was 7525.

Table 3: Displacement and the destroyed the villages of all Kurdistan not introduced by Iraqi higher court of Criminal

<table>
<thead>
<tr>
<th>Genocide Campaigns</th>
<th>Location</th>
<th>Date</th>
<th>Number of Victims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under policies of Urbanization and deportations, and genocide</td>
<td>All Kurdistan’s governorates and districts</td>
<td>1961 to 1962</td>
<td>Over 150 villages were destroyed and 3000 Kurds displacement</td>
</tr>
<tr>
<td>Displaced of civil citizens</td>
<td>Kirkuk Governorate and districts</td>
<td>10/07/1962</td>
<td>40000 persons displaced</td>
</tr>
<tr>
<td>Destroyed of villages</td>
<td>All Kurdistan’s governorates and districts</td>
<td>06,07/1963</td>
<td>Over 2875 villages were burned</td>
</tr>
<tr>
<td>Displacement campaign</td>
<td>All Kurdistan’s governorates and districts</td>
<td>1975</td>
<td>More than 200000 persons displaced</td>
</tr>
<tr>
<td>Displacement campaign</td>
<td>All Kurdistan’s governorates and districts</td>
<td>1979</td>
<td>700000 persons displaced</td>
</tr>
<tr>
<td>Displaced and their Iraqi identity withdrawn of Fayli Kurds were forcefully</td>
<td>All Kurdistan’s governorates</td>
<td>1952 to 1982</td>
<td>Over 500000 persons displaced</td>
</tr>
<tr>
<td>The Anfal campaign was performed in 8 phases</td>
<td>All Kurdistan’s governorates and districts</td>
<td>21/02/1988 to 06/09/1988</td>
<td>4500 villages were destroyed</td>
</tr>
<tr>
<td>Total</td>
<td>All Kurdistan’s governorates and districts</td>
<td>1952 to 1988</td>
<td>A- 1443000 person displaced B- 7525 villages destroyed</td>
</tr>
</tbody>
</table>

Table 4 shows the distribution of the genocide (Anfal campaign and chemical attacks) of Kurdish people according to the Kurdistan governorates. Majority of the genocide was done in
the Sulaymania Governorate (Anfal was 30.74% and chemical weapons was 12.3%). Regarding Erbil Governorate the percentage of Anfal campaign was 16.35% while chemical attacks was 1.33%. Duhok Governorate was less affected by Anfal and chemical weapons which represented 6.59% and 0.54% respectively. Finally, Kirkuk Governorate Anfal and Chemical Attacks was 22.15% and 0.24% respectively.

Table 4: Kurdish Genocide regarding Governorate by Anfal and Chemical Attacks

<table>
<thead>
<tr>
<th>Governorate</th>
<th>Anfal %</th>
<th>Chemical Attacks %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erbil</td>
<td>16.35</td>
<td>1.33</td>
<td>17.68</td>
</tr>
<tr>
<td>Sulaimani</td>
<td>30.74</td>
<td>12.3</td>
<td>42.77</td>
</tr>
<tr>
<td>Duhok</td>
<td>6.59</td>
<td>0.54</td>
<td>7.13</td>
</tr>
<tr>
<td>Kirkuk</td>
<td>22.15</td>
<td>0.21</td>
<td>22.37</td>
</tr>
<tr>
<td>Other Governorate</td>
<td>10.03</td>
<td>0.24</td>
<td>10.27</td>
</tr>
<tr>
<td>Total</td>
<td>85.86</td>
<td>14.14</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5 turns up the age of victims attached to chemical weapons. The majority of age between were within the age of 4-6 years, which represented 26.04%, while the lowest percentage was 1.23% within the age of 65 – 69 years old.

Table 5: Age groups of victims of Chemical Attacks

<table>
<thead>
<tr>
<th>Age groups</th>
<th>Male %</th>
<th>Female %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>7.17</td>
<td>6.67</td>
<td>13.84</td>
</tr>
<tr>
<td>5-6</td>
<td>6.36</td>
<td>5.84</td>
<td>12.20</td>
</tr>
<tr>
<td>10-14</td>
<td>5.31</td>
<td>4.03</td>
<td>9.34</td>
</tr>
<tr>
<td>15-19</td>
<td>9.57</td>
<td>3.77</td>
<td>13.35</td>
</tr>
<tr>
<td>20-24</td>
<td>8.51</td>
<td>2.75</td>
<td>11.25</td>
</tr>
<tr>
<td>25-29</td>
<td>4.55</td>
<td>1.88</td>
<td>6.42</td>
</tr>
<tr>
<td>30-34</td>
<td>7.12</td>
<td>2.06</td>
<td>9.18</td>
</tr>
<tr>
<td>35-39</td>
<td>6.19</td>
<td>1.79</td>
<td>7.99</td>
</tr>
<tr>
<td>40-44</td>
<td>3.09</td>
<td>0.87</td>
<td>3.96</td>
</tr>
<tr>
<td>45-49</td>
<td>2.02</td>
<td>0.78</td>
<td>2.80</td>
</tr>
<tr>
<td>50-54</td>
<td>1.61</td>
<td>0.59</td>
<td>2.20</td>
</tr>
<tr>
<td>55-59</td>
<td>1.45</td>
<td>0.71</td>
<td>2.16</td>
</tr>
<tr>
<td>60-64</td>
<td>1.18</td>
<td>0.55</td>
<td>1.73</td>
</tr>
<tr>
<td>65-69</td>
<td>0.83</td>
<td>0.39</td>
<td>1.23</td>
</tr>
<tr>
<td>70+</td>
<td>1.64</td>
<td>0.72</td>
<td>2.35</td>
</tr>
<tr>
<td>Total</td>
<td>66.61</td>
<td>33.39</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6 exhibits the percentage of victims according to nationality. Most victims were among Kurdish people (99.39%) while the lowest percentage (0.12%) of victims were among Chaldeans nationality.

Table 6: Percentage of victims according to ethnicity or nationality

<table>
<thead>
<tr>
<th>Ethnicity or Nationality</th>
<th>Erbil %</th>
<th>Sulaimani %</th>
<th>Kikuk %</th>
<th>Duhok %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kurds</td>
<td>(19.65)</td>
<td>(47.55)</td>
<td>(24.87)</td>
<td>(7.32)</td>
<td>(99.39)</td>
</tr>
<tr>
<td>Arabs</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Turkmen</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Assyrians</td>
<td>(0.01)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.49)</td>
<td>(0.50)</td>
</tr>
<tr>
<td>Kaldans</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.12)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>Armenians</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Total</td>
<td>(19.66)</td>
<td>(47.55)</td>
<td>(24.87)</td>
<td>(7.92)</td>
<td>(100)</td>
</tr>
</tbody>
</table>
Table 7 explains the genocide victims according to the different religious groups. Majority of the victims were Muslims (98.94%), while 0.09% of them were Kakaiy peoples, and there were other religious groups.

**Table 7:** Percentage of genocide victims belonging to different religious groups

<table>
<thead>
<tr>
<th>Religion</th>
<th>Erbil</th>
<th>%</th>
<th>Sulaimani</th>
<th>%</th>
<th>Kikuk</th>
<th>%</th>
<th>Duhok</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muslims</td>
<td>(19.64)</td>
<td>(47.45)</td>
<td>(24.83)</td>
<td>(7.02)</td>
<td>(98.94)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christens</td>
<td>(0.02)</td>
<td>(0.03)</td>
<td>(0.02)</td>
<td>(0.64)</td>
<td>(0.71)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kakaiy</td>
<td>(0.00)</td>
<td>(0.08)</td>
<td>(0.01)</td>
<td>(0.00)</td>
<td>(0.09)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yazidees</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.27)</td>
<td>(0.27)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>(19.66)</td>
<td>(47.55)</td>
<td>(24.87)</td>
<td>(7.92)</td>
<td>(100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8 illustrates common diseases that occurred in the families of the genocide and survivors as outcomes of used chemical weapons and other Kurdish tragedy in KRG. Most of them (2.81%) have Stomach problems, while 0.09% of them have Cancer in spite of other diseases as (Diabetes, Heart, eye, back problems and others).

**Table 8:** Illness is occurring among the victim's families and survivors.

<table>
<thead>
<tr>
<th>Illness</th>
<th>Erbil</th>
<th>%</th>
<th>Sulaimani</th>
<th>%</th>
<th>Kikuk</th>
<th>%</th>
<th>Duhok</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>(0.44)</td>
<td>(0.24)</td>
<td>(0.19)</td>
<td>(0.21)</td>
<td>(1.08)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood pressure</td>
<td>(1.14)</td>
<td>(0.62)</td>
<td>(0.41)</td>
<td>(0.50)</td>
<td>(2.67)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart problems</td>
<td>(0.41)</td>
<td>(0.28)</td>
<td>(0.19)</td>
<td>(0.22)</td>
<td>(1.10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swallowing</td>
<td>(0.41)</td>
<td>(0.37)</td>
<td>(0.10)</td>
<td>(0.08)</td>
<td>(0.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back problems</td>
<td>(1.04)</td>
<td>(0.62)</td>
<td>(0.40)</td>
<td>(0.31)</td>
<td>(2.37)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye</td>
<td>(0.74)</td>
<td>(0.73)</td>
<td>(0.28)</td>
<td>(0.28)</td>
<td>(2.03)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nose and Ear</td>
<td>(0.24)</td>
<td>(0.21)</td>
<td>(0.09)</td>
<td>(0.10)</td>
<td>(0.64)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.02)</td>
<td>(0.01)</td>
<td>(0.09)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stomach problems</td>
<td>(1.14)</td>
<td>(0.77)</td>
<td>(0.52)</td>
<td>(0.38)</td>
<td>(2.81)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological problems</td>
<td>(0.23)</td>
<td>(0.24)</td>
<td>(0.14)</td>
<td>(0.25)</td>
<td>(0.86)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin</td>
<td>(0.15)</td>
<td>(0.20)</td>
<td>(0.07)</td>
<td>(0.07)</td>
<td>(0.49)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood decrease</td>
<td>(0.15)</td>
<td>(0.09)</td>
<td>(0.04)</td>
<td>(0.08)</td>
<td>(0.36)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Romatism</td>
<td>(0.52)</td>
<td>(0.37)</td>
<td>(0.19)</td>
<td>(0.30)</td>
<td>(1.38)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9 describes some of the psychiatric problems that occurred among families Anfal. The majority of samples complained about anxiety (26.98%), while 7.44% of them had epilepsy. Other problems among them were Affright, Depression and Disremember.

**Table 9:** Psychiatric problems occurred among Kurdish families after Anfal.

<table>
<thead>
<tr>
<th>Psychiatric problems</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>108</td>
<td>(26.98)</td>
</tr>
<tr>
<td>Affright</td>
<td>104</td>
<td>(26)</td>
</tr>
<tr>
<td>Depression</td>
<td>98</td>
<td>(24.39)</td>
</tr>
<tr>
<td>Disremember</td>
<td>60</td>
<td>(15.17)</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>30</td>
<td>(7.44)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>400</td>
<td>(100)</td>
</tr>
</tbody>
</table>

Table 10 demonstrates the genocide of Yazidiane population on different dates. From Ottoman solder in 1640, at 2007 by Iraqi Mosul forces and in 2014 done by ISIS in Sinjar.
### Table 10: Genocide of Yazidian population by ISIS and other forces.

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of killed</th>
<th>Battle done by</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>1640</td>
<td>3,060</td>
<td>Ottman solder</td>
<td>Mount Sinjar2</td>
</tr>
<tr>
<td>2007</td>
<td>500</td>
<td>Forces Mosel</td>
<td>Qahtaniyah and Jazeera in Shigal</td>
</tr>
<tr>
<td>2014</td>
<td>5,000 men killed</td>
<td>ISIS</td>
<td>Shigal</td>
</tr>
<tr>
<td>2014</td>
<td>7000 children and women missing</td>
<td>ISIS</td>
<td>Shigal</td>
</tr>
</tbody>
</table>

### Discussion

The findings of the study revealed that Kurdish genocide had been begun in the early time from (1952, 2961 to 1988 and over as in 2014 by ISIS) this was written and agreed in the documentation book issued from Kurdish genocide conference done in 2008 in KRG. The other findings indicated that the most victims of chemical weapon from Sulaymaniyah governorate which represented nearly about (42.77%), this was written and mentioned in the Kurdish genocide conference in 2008. Regarding the range of age among Kurdish victims of Anfalization was between one month old to 70 years old and above this was explained in the table 5 in the Kurdish genocide conference. According to religion, the majority of Kurdish victims were Muslims nearly about (98.94%), while 0.09% of them were Kakaiey, this was supported in (genocide conference, 2008). Regarding common diseases attached the Kurdish people as a result of Anfalization, deportation and other tragedies events in Kurdistan region included the following diseases (diabetic 1.08%, eye diseases 2.04%, cancer 0.08%, and other diseases so all these diseases were explained in Kurdish genocide conference in 2008. There were common psychiatric diseases attached female individuals as a result of so much tragedy events, chemical weapon, Anfalization, deportation and cleansing ethnics of Kurdish people by Saddam Regime so these psychiatric diseases are included: Affright, depression, disremembers, anxiety 26.98% and epilepsy 7.44% ) so all these diseases are written in the book issued by 2011 think most of the diseases and Kurdish tragedy were as an outcome of the Anfal campaign. The 1988 Anfal Campaign in Iraqi Kurdistan began when the Iraqi army, assisted by the air force, launched a large-scale military operation in Kurdistan areas or villages at the first meeting of the winter snows, in the early hours of 23 February 1988. Ali Hassan al-Majid was named as (Chemical Ali was responsible for using chemical weapons during the Anfal campaign. So, the peshmergas had learned to cope with chemical attacks, moving to higher ground and building fires; moreover, they had started receiving gas masks and ampules with atropine, an antidote to nerve gas, from their Iranian allies. Thus the assault continued for three weeks without notable success; this was documented by another study. A number of visitors to Kurdistan have referred to Anfal in their writings. The best original, though fragmented, the account can be found in Jonathan Randal’s After Such Knowledge; other references to Anfal for example by Kerim Yildiz, are mostly derivative. These visitors may help Kurdish people to approve Kurdish genocide in an international criminal justice court. The series of eight military campaigns conducted from February to August 1988 together constitute one of the most concerted and tragic series of events in the history of human affairs. These campaigns began close to the Iranian border but eventually stretched far across a swath of Iraqi territory and to the border between Iraq and Turkey. The Anfal campaign stands as a monument to the level of savagery that eats at the very heart of what polite people call civilization. Civilized people want what is good for each other. The defendants brought before the bar of justice in Baghdad conducted a deliberate, systematized, and orchestrated series of campaigns intended to eradicate every trace of Kurdish civilization and culture across a broad swath of Northern Iraq. They acted with a calculated cruelty and deliberateness of purpose because they felt secure in the belief that they were more important than the law. They embody the essence of impunity because their actions betrayed the belief that Saddam’s power would
forever shield them from any accountability. Juxtaposed against the ongoing work of the ad hoc tribunals established by the United Nations Security Council, proliferation of internationalized/hybrid domestic mechanisms, and the increasing use of domestic forums to prosecute the most serious crimes of concern to the international community, the Anfal trial represents irrefutable evidence that the era of accountability is irreversibly underway. The Yazidi Genocide had begun in early time by different forces as Othman forces, Iraqi forces and finally ISIS forces in 2014 this findings agreed with human right report in 15-June 2016 about mass graves and genocide of Yazidi, this findings also agreed with the study of Valeria et al, 2014. We think it is necessary till now working hard to support Kurdish genocide by the international criminal justice court, European Parliament, UN with cooperation with Iraqi High Criminal Court for that.

Conclusion
All documents that we have been used in the study revealed that the Kurdish genocide had begun in early times as in 1952, 1961 and especially after the Arab nationalist Baathists took power in 1968. Continue to 1988 and over as Yazidi genocide done by ISIS in 2014, Kurdish genocide was done in different military Campaign in Kurdistan so the outcomes of these military campaigns were included very high numbers of victims according to age, religion, ethnic and nationality, while there were high level of diseases attached Kurdish people and there were psychiatric problems among families and female victims as a result of deportation, Arabization, cleansing ethnic and Anfal phases. The total of the destroyed village was nearly about 7525, and Kurdish people that displaced nearly about 1443000, while the total of Kurdish genocide from the year 1952 to 1988 nearly about 221944. Regarding Yazid genocide by ISIS in 2014 nearly about 5000 men were killed, and 7000 children and women were lost and missing while most of them were saved from ISIS and till now attempts are continuing to save others.

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13- Documentation project No.4 Kurdistan government /ministry of Anfal and martyr, directorate of Anfal statistics and documentation. 2008.


Mass grave excavation and osteological evaluation of mass grave in Shaxke- Duhok

Yasin Kareem Amin, Medical Research Center, Hawler Medical University
Aras Rafiq Abdulla, College of Medicine, Hawler Medical University
Email address: dr.yasin@hmu.edu.krd

Abstract

Background and Objective: anthropological evaluation of mass graves considered as one of the important steps for scientific documentation of mass graves. The main objective of this study is to investigate the exhumation, osteological evaluation and individual victim identification of a mass grave in Shaxke village, Duhok governorate, Iraqi Kurdistan region. Methods: The investigation included excavation of the graves and identification of the victims. The field study was started after taking testimonies and witnesses for locating the site of graves. The site was determined, which were excavated according to the scientific standard procedures. Sex determination, age and stature estimation were performed on the remained skeletons in the laboratory of medico-legal institute-Erbil. Results: The grave included 13 bodies, 10 of them were males which constitute about 77% of the bodies and 2 of them were possibly male which are approximately 15% percent of the bodies, while the other one was not identified because of degradations happens to the bones. The results of age estimation reported that all victims were young and their age was between 17-23 years old. The results of stature revealed that 11 cases had stature more than 160cm, while only one case was less than 159 cm and the other one was not identified because of bone. All the remained bones were recorded in details for more documentation. Conclusion: This finding described the anthropological evaluation of 13 victims peshmergas mass graves in Shaxke village, Duhok governorate, Iraqi Kurdistan region. Keywords: Mass grave; Shakhke, Exhumation; Identification

Introduction

Shaxke is a small village located in the north region of Duhok governorate. Mass graves skeletal remains identification and anthropological studies regarded as the key step towards documenting human rights violations and giving back the victim’s remaining skeleton to their families. The mass graves in Iraq are identified as unmarked sites containing at least six bodies. Some can be characterized as deep pits that appear to have been filled or by mounds of earth piled above the ground, but older mass graves are difficult to found, because over this long period of time, they have been covered by debris and vegetation. Various mass graves have been identified in almost all regions of Iraq that contain people of different religious and ethnic groups as well as foreign nationals, including Arabs such as Kuwaitis and Studies. According to the estimation of the Iraqi government, the number of missing people reached about 250000 victims; however, some estimates put the number of missing people from the crimes committed by Saddam's army, including attacks against the Kurds in the 1980s and 1990s, at more than 1million. Therefore, the Kurdish people say "There is another Iraq, buried under Iraq." The main intention of this paper is to present and discuss the exhumation, anthropological evaluation and individual victim identification including estimation of victim’s age, gender and stature of a mass grave in Shaxke village, Duhok governorate, Iraqi Kurdistan region.
Methods
Study setting and design
The current study was designed as a descriptive investigation for the mass graves in Shaxke. The field work was started in 2010 which included taking testimonies and witnesses, site description and excavation. The morgue study was performed in 2011. The study duration was ten months.

Testimonies and witnesses for locating the graves sites
However, of the emotional influences on the witnesses’ statements, but still they were the most important and reliable source of information for general or specific site location of the graves. Although different techniques are used to identify the human corpse, one of the methods used under this study is the identification of human corpse through statements by survivors (those who knew the victims).

Site Description and Assessment
Before the excavation took place, a preliminary visit to the suspected site was made to map the area to be excavated. Above all, we insured that the area has been cleared of surface debris. The graves sites were in Shaxke village, which is located in the north region of Duhok city.

Excavation
After identifying the location of the grave sites, the major dimensions (width, length and depth) were estimated as closely as possible. The surface of the ground was examined for finding any important evidence such as bullets, jewelry, personal belongings, etc) before being slowly and carefully removed. Soil removal then probed by careful use of picks and shovel and finally, with trowels and brushes.

Figure 1: The excavation and exhumation processes in Shaxke mass grave in Shaxke village- Duhok governorate- Iraqi Kurdistan region
Osteological Analysis
The osteological analysis is concerned with the determination of the identity of a skeleton, by estimating its age, sex and stature. A count of the ‘minimum number of individuals'(MNI) was performed as standard procedure in osteological reports on inhumations to confirm how many individuals are present by the articulated and disarticulated human bones. The MNI was calculated by counting all long bone ends, as well as other larger skeletal elements recovered. The MNI was considered as the largest number of these skeletons. The MNI is mostly lesser than the actual number of skeletons which have been interred on the site, but it can represent the scientifically proven minimum number of individuals in the graves.\(^7\)

Age was determined using standard aging techniques.\(^8\) Age estimation relies on the presence of the pelvis and uses different stages of bone development and degeneration to calculate the age of an individual. Age is split into two categories: Young victims include the ages below 18 years old, and adult victims, which include the ages equal or more than 18 years old.

Sex determination was carried out using standard osteological techniques, such as those described by Mays.\(^9\) Assessment of sex in both males and females relies on the preservation of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood. Stature was estimated by applying the formulae for the maximum length of femur developed using modern Portuguese samples.\(^10\)

Data analysis
Microsoft Excel program was applied for summarizing and graphical presentation of the data. Percent values were calculated as a descriptive statistical analysis for the acquired data.

Results and Discussion
Several interviews had been made prior to starting the fieldwork. Also, we took witnesses from the people who were living in the villages around.

The victim's bodies then transferred to Erbil city, the capital city of Iraqi-Kurdistan region, where they stored in the morgue of Kurdistan Medico-legal Institute. The laboratory works were done in special laboratories of the Medico-legal Institute for estimation of Age, Sex and stature after the bodies have been separated and the skeleton outline finished. All the works had been done by a special team who had taken a training course in ICMP program. The results are shown in figures 2 and 3.

Using special form prepared by ICMP, we recorded the presented and absent bones for everybody as much as possible, because this work was very difficult and needed too much hard work as most of the bones were degenerated.

Figure 2 showed that almost all the victims were male. However, we couldn't find out all bodies as they were degraded. Seven body remains were surely male according to our evaluation, while only two bodies were possibly male and the last one was not identified.

Figure 3 illustrates the distribution of stature. According to our results, the majority of victims in were young people and their stature were more than 160cm, and one victim was less than 160cm and the for last one we couldn't determine the stature. The technique applied for age identification was very useful, but the skeletal remains were the challenge for stature determination because the victims remaining bones determine the efficacy of the results.\(^11\)
Figure 2: Sex distribution according to sex determination procedure in both sites.

Figure 3: Distribution of stature

References

Yassin K. Amin, Hawler Medical University
Goran Q. Othman, Erbil Polytechnic University
Email address: dr.yasin@hmu.edu.krd

Abstract
Background and objective: This study aimed to investigate two mass graves located in Sorya village, Duhok governorate, Iraqi Kurdistan region.

Methods: The investigation included excavation of the graves and identification of the victims. The field study was started after taking testimonies and witnesses for locating the site of graves. Two sites were described (site 001 and site 002), which were excavated according to the scientific standard procedures. Sex determination, age and stature estimation were performed on the remained skeletons in the laboratory of the Medico-legal Institute, Erbil.

Results: Site 001 included 14 bodies, two of them were males and five were females, whereas the others were not identified because of degradations happens to the bones. Site 002 included 25 bodies which were Christians according to witnesses and supported by evidence. Four victims appeared to be males, 14 were females and seven couldn't be identified. The results of age estimation reported that the number of young bodies in site 001 was five bodies which represent 35.7% of the all, while 13 out of 25 were young bodies in site 002 which produced 52% of all victims. All the remained bones were recorded in details for more documentation.

Conclusion: This finding described the exhumation and anthropological evaluation of two mass graves in Sorya, Duhok governorate Iraqi Kurdistan region, which the majority of the victims were females and contained Christian and Muslims people.

Keywords: Mass graves; Christian victims; Sorya village; Anthropological identification.

Introduction
Throughout modern history, Christians have been geographically dispersed, with large numbers in cities across Iraq. In 1961 there were one million Christians in northern Iraq. However, by 1979, 50% of Christians were said to be living in Baghdad, making up 14% of the capital’s population. Under the Arabisation policies of the Ba’ath regime, the community was required to identify as either Arab or Kurd in the 1977 census. Now, the largely reduced Christian population remains in Baghdad, Basra, Kirkuk, the Nineveh Plains, as well as the Erbil and Duhok governorates in the Kurdistan regional government.

The last Iraqi census, in 1987, counted 1.4 million Christians, but the economic sanctions during the 1990s led to their migration abroad. Before starting the Gulf War between Iraq and Coalition forces in 1991, they were estimated at one million. By the time of the US-led invasion in 2003, that figure fell to about 800,000. Then the numbers are thought to have fallen dramatically after attacking them by different groups of terrorist especially in Nainawa.

The identification of mass graves skeletal remains and anthropological evaluation considered as the most important step toward documenting human rights violations which lead to giving back to families the remaining skeleton of victims, which are considered, until exhumed, as lost or disappeared.

The mass graves in Iraq are identified as unmarked sites containing at least six bodies. Some can be characterized as deep pits that appear to have been filled or by mounds of earth piled above the ground, but older mass graves are difficult to found, because over this long period of time, they have been covered by debris and vegetation. Various mass graves have been
identified in almost all regions of Iraq that contain people of different religious and ethnic groups as well as foreign nationals, including Arabs such as Kuwaitis and Saudis.\(^1\)

The Iraqi government estimates that there are 250000 to a million of missing people, according to the International Commission on Missing Persons (ICMP); however, some estimates put the number of missing from Saddam’s attacks, including attacks against the Kurds in the 1980s and 1990s, at more than 1 million. Therefore, the Kurdish people say “There is another Iraq, buried under Iraq.”\(^2\)

The main intention of this paper is to present and discuss the exhumation, anthropological evaluation and individual victim identification of two mass graves in Sorya village - Duhok governorate - Iraqi Kurdistan region.

**Methods**

**Testimonies and witnesses for locating the graves sites**

However, of the emotional influences on the witnesses’ statements, but still they were the most important and reliable source of information for general or specific site location of the two graves. In this study, we depend on the witness’s statements which they were victims saved from the killing.

**Site Description and Assessment**

Before the excavation took place, a preliminary visit to the suspected site was made to map the area to be excavated. Above all, we insured that the area has been cleared of surface debris. The graves sites were in Sorya village, which is located on the old road between Duhok city and the countryside of Zaxo. We found two mass grave sites (site 001 and site 002). The two mass grave sites were in different locations, near to each other for about 50 meters, and they were different in their sizes. The first site appeared to be smaller and contains less number of bodies.

**Excavation**

After identifying the location of the two gravesites, the major dimensions (width, length and depth) were estimated as closely as possible. The surface of the ground was examined for finding any important evidence such as bullets, jewelry, personal belongings, etc) before being slowly and carefully removed. Soil removal then probed by careful use of picks and shovel and finally, with trowels and brushes. But for site 002, which was contains Christian people killed during the repression of 1969, we first broke the stony wall which had made by the Christian people for 42 years ago for the sake of recognizing the place.

![Figure 1: The excavation and exhumation processes in two mass graves in Sorya village- Duhok governorate- Iraqi Kurdistan region](image-url)
Osteological Analysis
The osteological analysis is concerned with the determination of the identity of a skeleton, by estimating its age, sex and stature. A count of the ‘minimum number of individuals’ (MNI) was performed as a standard procedure in osteological reports on inhumations to confirm how many individuals are present by the articulated and disarticulated human bones. The MNI was calculated by counting all long bone ends, as well as other larger skeletal elements recovered. The MNI was considered as the largest number of these skeletons. The MNI is mostly lesser than the actual number of skeletons which have been interred on the site, but it can represent the scientifically proven minimum number of individuals in the graves.  

The osteological analysis is concerned with the determination of the identity of a skeleton, by estimating its age, sex and stature. Age was determined using standard aging techniques. Age estimation relies on the presence of the pelvis and uses different stages of bone development and degeneration to calculate the age of an individual. Age is split into two categories: Young victims include the ages below 18 years old, and adult victims, which include the ages equal or more than 18 years old. 

Sex determination was carried out using standard osteological techniques, such as those described by Assessment of sex in both males and females relies on the preservation of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood. Stature was estimated by applying the formulae for the maximum length of femur developed using modern Portuguese samples.

Data analysis
Microsoft Excel program was applied for summarizing and graphical presentation of the data. Percent values were calculated as a descriptive statistical analysis for the acquired data.

Results
The victim's bodies then transferred to Erbil city, the capital city of Iraqi-Kurdistan region, where they stored in the morgue of Kurdistan Medico-legal Institute. The laboratory works were done in special laboratories of the medico-legal institute for estimation of Age, Sex and stature after the bodies have been separated and the skeleton outline finished. All the works had been done by a special team who had taken a training course in ICMP program. The results are shown in tables 1 and 2.

Table 1: Site 001 detailed information including presented bones, age and stature

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Stature (cm)</th>
<th>Age</th>
<th>Cranial</th>
<th>facial</th>
<th>Mandible</th>
<th>vertebrae</th>
<th>Upper limb:R</th>
<th>Upper Limb:L</th>
<th>Pelvis</th>
<th>Upper limb:R</th>
<th>Lower Limb:L</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>N.A.</td>
<td>34</td>
<td>N.I</td>
<td>N.I</td>
<td>N.I</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>N.I</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>M2</td>
<td>N.A.</td>
<td>171</td>
<td>N.I</td>
<td>N.I</td>
<td>Av.</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>Av.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>M3</td>
<td>N.A.</td>
<td>Av.</td>
<td>N.I</td>
<td>L.L</td>
<td>Av.</td>
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<td>N.I</td>
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<td>N.I</td>
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N.A.: Not assigned, N.I: Nill, Av: Available
Using special form prepared by ICMP, we recorded the presented and absent bones for everybody as much as possible, because this work was very difficult and needed too much hard work as most of the bones were degenerated.

For determination of sex, we tried to determine all, but some of the bodies were not appropriated for that determination, especially the bodies of mass grave site 001.

Figure 2, illustrates the distribution of sex in both sites separately. According to our results, the majority of victims in both sites were females, as we reported five females in site 001 among 14 Muslim bodies, while the number of females in site 002 were 14 out of 25 victims, however of seven bodies in site 001 and seven victims in site 002 which we couldn't determine the sexes. The technique applied for age identification was very useful, but the skeletal remains determine the efficacy of the results.\textsuperscript{11}

Table 2: Site 002 detailed information including presented bones, age and stature.

<table>
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<th>Case No.</th>
<th>Stature(Cm)</th>
<th>Age</th>
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<th>Facial</th>
<th>Mandible</th>
<th>Vertebrae</th>
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<th>Upper Li. mb:L</th>
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\textbf{N.A.}: Not assigned, \textbf{NI}: Nill, \textbf{Av}: Available
Figure 2: Sex distribution according to sex determination procedure in both sites.

Figure 3: Age distribution according to age determination procedure in both sites.

In Figure 3, we explained the distribution of ages in both sites. According to the results of the present study, most of the victims were young people on both sites. The number of young bodies in site 001 was five bodies which represent 35.7% of the all, while 13 out of 25 were young bodies in site 002 which produced 52% of all victims.

Figure 4: An evidence showing Christian cross found in site 002
Discussion
Before site determination procedure, we made several interviews with the people who lived in that region at that time. For example, we relied on the witness's statements of a mother who claimed that she has two children found in the grave. Also, we took witnesses from the people who were living in the villages around. According to their speech, one of the mass graves contains Christian people with Muslim people after operation of killing all people number 39 person in different age and sex family of all victim building a strong and highly room around the people killing in two site near them separated the Christian and Muslim people dimensions about 3 by 3 meters and height about 6-7 meters by a strong stone and cement selling the room to protect the remain cadaver inside the room. This building room protect for more than 40 years.
After we performed the excavation and exhumation works according to the standard procedure, we found the skeletons under 6-7m under the ground, which there was an accumulation of groundwater wrapped the bodies, making the works very hard. After ten successive days of working, we finished the works in the field.

Conclusion
This finding described the exhumation and anthropological evaluation of two mass graves in Sorya, Duhok governorate Iraqi Kurdistan region, which the majority of the victims were females and contain Christian and Muslims people. Testimonies from relative and witnesses as well as diverse sources of documentary information. Some mass graves without the testimonies and witnesses difficult to exhumation and identification and estimation of age and sex in the site of the mass grave of Sorya. Finally, identification processes of Kurdish mass graves should be supported funding by the government of Iraq and the Kurdistan Regional Government to do working of the mass grave and identified all graves and provided by the making the research for identification of mass graves.

References
Role of women after genocide among Barzanian families in the Kurdistan Region of Iraq

Paywand Safeen Naqshbandi1, Muaf Abdulla Karim2*
1 Erbil Polytechnic University, the Kurdistan Region of Iraq
2 Continuous Professional Development Center, General Directorate of Erbil Health
Email address: muafabdulla82@yahoo.com

Abstract
Background and objective: Genocide of Barzani people in 1983 led to the disappearance and death of 8000 Barzani males. After the genocide, Barzani women played an important active role which has been ignored by almost all research studies. The present study was an investigation into Barzani women’s lived experiences in order to figure out their role after the genocide of Barzani people.

Methods: The present investigation was a qualitative investigation which was carried out by inductive content analysis method. The required data were obtained through in-depth semi-structured interviews with 10 Barzani women who had survived the Barzani genocide. Finally, analyzing the collected data through inductive content analysis method led to the extraction of the main themes and subthemes.

Results: The data analysis led to the emergence of three main themes namely, "making enormous efforts," "raising the children well," and "creating the family's future" which proved that Barzani women played a significant active role during and after the Barzani genocide.

Conclusion: Barzani families, especially their women, have been through a large number of problems and challenges and consequent mental and physical harms as a result of losing their spouses and sons to the Barzani genocide; therefore, they need special assistance particularly from nurses and medical personnel in hospitals.

Keywords: Genocide; Barzani Kurds; Barzani women; Kurdistan Region of Iraq; Qualitative study.

Introduction
Simply defined as a coordinated attempt to destroy a group of people because who they are,1 genocide can be the worst experience that a group of people can face. One of the most horrible genocides experienced by Iraqi Kurds was the genocide of Barzani people, which led to the arresting and exterminating of Barzani men in mass graves. As a result of this genocide which is also called gendercide, 8000 Barzani men who were 14 years old and more were transported to southern Iraq and killed by the Baath Regime on July 30th, 1983.2 This crisis was one of the results of the Algiers Agreement of 1975 based on which Iraq, Iran, and Turkey decided to create a security belt within 10 to 20 km from the border and move all the population residing that region.3

In addition, a review of the history of Iraq over the last four decades reveals that this country has constantly experienced political and economic challenges. Although both Iraqi men and women have gone through the same experiences and equally acquired survival skills during this period, different western and local media and research studies have depicted the women as passive victims and neglected their role as active participants during and after armed conflicts.4-7

As a major part of the Iraqi population, Kurds have always been involved in the ongoing violence in the country. In this regard, different studies have focused on different aspects including the Kurdish women’s situation throughout this period of violence. These studies have focused on violence against the wives of the Peshmarga8 and violence-coping strategies among Kurdish women victimized by genocide.9 However, research focusing on the women role’s in
social, political, and economic issues has presented contradicting results,\textsuperscript{10} therefore, it is highly recommended that more empirical research should be carried out in order to understand women’s experiences more deeply.\textsuperscript{11}

To the best of the authors’ knowledge, research studies have failed to consider the active role of Barzani women who challenged the stereotype of seeing women as passive victims during violent events. After the genocide of Barzani Kurds, leading to the death of almost all Barzani men, Barzani women had to play their previous roles as women and also shoulder the responsibilities of their husband or sons; however, this active role of Kurdish women has been neglected in research studies. This active role of Barzani women has been neglected in relevant investigations; therefore, the present qualitative study was aimed at investigating the Barzani women’s active role after the genocide of Barzani families in the Kurdistan Region of Iraq.

**Methods**

**Study design**

In the present qualitative study, the lived experiences of 10 Barzani women who were survived the Barzani genocide were investigated by utilizing an inductive content analysis method.\textsuperscript{12,13}

**Participants**

The study sample consisted of 10 Barzani women who participated in the present study willingly. In order to select the study sample, a convenience sampling method was utilized. The inclusion criteria were being a Barzani genocide survivor, willingness to participate in the study, and the ability to remember and express experiences related to the period during and after the genocide. The exclusion criteria were lack of willingness to participate in the study and the inability to remember and express the genocide-related experiences and events. The participants' age range was between 50 and 67 years old. They were all Barzani Kurds who lived in Erbil, the Kurdistan Region of Iraq.

**Data collection**

The required data were collected through in-depth semi-structured interviews with the participants from July to September 2018. The interviews were carried out at the participants' home where they could feel comfortable and express their experiences more freely. Data collection continued until data saturation was obtained and no new concepts emerged. In order to elicit information on the participants' lived experiences, the interviews were commenced by asking general questions such as, "What do you remember about the Barzani genocide of 1983?" or "Can you tell me what happened to Barzani the people in 1983?" followed by questions like, "What problems did you face after the genocide?", "How was your life after the genocide?", "How did you make a living?", or "What were your challenges after the genocide?" The participants were given enough time to think and remember their experiences. Each interview lasted for about 50 to 75 minutes. All of the interviews were recorded and then transcribed for further analysis.

**Data analysis**

In order to analyze the collected data, a qualitative content analysis method was employed.\textsuperscript{12} In so doing, the recorded interviews were transcribed verbatim. Afterward, an experienced translator translated the transcriptions which were analyzed via inductive content analysis method as suggested by Elo and Kyngäs (2008).\textsuperscript{13} During the first stage of this method, i.e., open coding, the transcriptions were read precisely, notes were taken, and the headings were marked in the margin of the text. To show all aspects of the content, the headings and themes were produced freely. During the second stage, i.e., creating themes, the transcripts were reread several times, leading to merging of similar headings, decreasing the number of themes, and producing broader themes. During the last stage, i.e., abstraction, a hierarchy for the developed
themes was formalized, all themes and their subthemes were labeled with a proper name according to their content, which resulted in the highest possible level of abstraction.\textsuperscript{13}

**Trustworthiness**
Trustworthiness refers to the level of soundness or adequacy of qualitative studies.\textsuperscript{14} In so doing, it is necessary to take into account the accurate description of data analysis procedure and justification of the reliability of the results.\textsuperscript{13} In the current study, trustworthiness was ensured by benefiting from the complementary opinions of experts who were three professors in the present study, establishing a good relationship with the participants and obtaining their trust, conducting the interviews at appropriate times and places, and reviewing the transcripts. Moreover, the researcher’s father was a Barzani genocide victim; therefore, she has been living within the same context and has enough experience which adds to the trustworthiness of the study and reliability of the collected data.

**Ethical considerations**
In order to take the ethical considerations into account, the present study was ethically approved by the Ethics Committee of Erbil Polytechnic University. Before the final participants were selected, they were provided with a thorough explanation about the study's objectives, data collection method, and confidentiality of their information, and their freedom to quit the study whenever they wished to. Afterward, informed consent to participation and recording of the interviews was retrieved from the participants. Each participant was given a unique code to keep the collected data anonymous, and the confidentiality of the data was ensured by keeping the files containing the collected data in a safe place.

**Results**
Analyzing the transcripts of the interviews through inductive content analysis method led to emergence of three main themes namely, “making enormous efforts”, “raising the children well”, and “creating the family’s future” which depict the sorrow and problems that Barzani women have gone through during and after the gendercide of 1983.

**Making enormous efforts**
One of the main themes of the present study, as revealed by analyzing the transcripts, was the Barzani women’s enormous efforts to make a living after losing their husband and other male family members. This theme depicts a sad image of Barzani women who had lost their men and sons and were displaced from their homes and had to work hard to make a living. In this regard Participant 2 said:

\begin{quote}
After the genocide, we lost everything, so we had to try extremely hard to make our lives from the beginning. You know, it is really difficult to see that you have lost whatever you have achieved throughout your life and you have to make your life from scratch once again. It's hard work.
\end{quote}

After losing their husband and son(s), as revealed by the participants, they had to take their husband's responsibilities, too; as a result, they play both their roles as a woman and their husband's role as a man. In this regard Participant 3 revealed:

\begin{quote}
Because the genocide had taken my husband from me, I had to work very hard to make a living and buy food for my children. I had a really hard time making a living, so I had to work long hours every day just to feed my young children.
\end{quote}

As a result of being displaced from their homelands, Barzani families had lost most of their properties and assets, and as a result of the gendercide, they had lost their males, which put a heavy burden on the women's shoulders because they had to work hard to make their lives again. This picture was described by Participant 5 who said:
After the genocide and being displaced, we lost most of our properties and assets, so we became really poor and we had to find jobs and work hard to tackle the problems caused by that nasty crisis. We had to work hard just to stay alive.”

The cruelty and nastiness of the Barzani genocide that took all males of over 14, which caused tremendous economic pressure on Barzani families, was described by Participant 8 who said:

"While we were displaced and living in camps, they came in large black trucks and took all men and boys over 14. After that day, we never heard anything of our males. It was really sad. We had no one to work and make a living for us. We were extremely poor, so we [women] had to work and earn money to run our lives. It was the cruelest thing I have ever seen in my life. We will never forget, we will never forgive.”

Raising the children well
The second main theme that emerged out of the participants’ stories was the Barzani women's attempts to raise their children as their next generation who could save their people and relieve their deep sorrow. This theme shows that although the Barzani women had gone through the worst and saddest experience in their lives, they did not forget raising a successful generation. In this regard, Participant 1 said:

"The genocide had a terrible effect on our lives, but we did not give up. We did not forget raising our children in the best way and preparing them for the future. We paid constant, careful attention to raising our children.”

The participants kept referring to the fact that they were successful in raising their children although they were under extreme economic pressure. For example, Participant 4 revealed:

“Although our life was really difficult following the genocide, we did not stop paying careful attention to our children. Raising our children in a good way was always a significant issue that we were dealing with in our daily lives.”

Moreover, Participant 7 said:

"After the crisis and losing my close relatives including my husband, I had to work hard every day. I used to work really hard so that my children would not feel our shortcomings and the loss of their father. Raising my children well was always my top priority.”

They also referred to the fact that despite their problems and challenges, they did not forget their children's education and schooling. For example, Participant 3 said:

“After we were displaced from our hometown, my children had to give up going to school for two years, but I never stopped paying attention to their education, so after the genocide and as soon as a local school was opened, I enrolled my two sons.”

Creating the family’s future
The last theme that appeared following the data analysis was the Barzani women’s efforts to create and guarantee their family’s future. As revealed by the participants, they have devoted all their lives to their family’s future by taking their children’s education into account, working, and earning money. In this regard, Participant 6 said:

"We gave our future to our children, and we spent all our life on them so they could be leading in their future life. Today's successful life of our children is the result of the fact that we devoted all our life to prepare them for the future.”

Emphasizing her children's educational success as a result of her unwavering attempts, participant 3 said:

"I lost my husband, but I did not give up on preparing my children for their future lives. I have two sons. One holds a PhD and the other one a master's degree. My attempts and their perseverance have made their life successful.”

Also, Participant 3 referred to her children’s good future and lives as a result of her hardworking and said:
“The genocide ran us to the ground, so we needed to compensate and stand on our feet again. In so doing, we tried to prepare our children for the future in a way that they would become role models for other people, and now they really are.”

Discussion
As the results of the present study indicated, Barzani Kurdish women underwent enormous grief as a result of losing their husbands and sons to the gendercide of 1983, and economic problems added to their grief and made them look for jobs and earn money to make a living. Moreover, they had to do something about their children’s future, so they raised them in a good way and made a successful generation. From what has been mentioned, it can be concluded that the Barzani women were not passive victims during and after the genocide of 1983, as depicted by most western and local media and research studies; therefore, the results of the present study question and are not in agreement with those reported by previous investigations.4-7 Similar depictions of women as passive victims of genocide are related to the Rwandan genocide, which is reported in a large number of studies15,16,17 However, the results of the present study are in line with the findings of the study conducted by Mlodoch (2012) who depicted Kurdish women as active participants in armed conflicts who wanted to be remembered as brave, strong women and not passive ones.9 The results also indicated that the Barzani women had to try hard to make a living for their families because of their extreme poverty caused by the genocide. Similar suffrage of and pressure on women who lost their husbands to war have been reported by Shahnazarian and Ziemer (2018) who studied the lived experiences of war widows in south Caucasus.18 The results of the present study also revealed that the Barzani women did not forget raising their children well although they were under extreme economic and emotional pressure. None of the previously conducted studies has referred to this fact that the Barzani Kurdish women were successfully able to raise and educate their children and prepare them for a bright future. This finding can also be a challenge to those western and local media and articles that have depicted Kurdish women as passive victims of armed conflicts or genocides. Similar to this finding, some studies have reported that Muslim women take advantage of “motherhood teaching” as a way to educate and raise their children and protect them against the surrounding threatening environment.19 The results also indicated that the Barzani women tried hard to create their families’ future. In so doing, they sent their children to school and worked hard and made a living so that their children did not feel the loss of their father. This finding is in line with those reported by Mojab (2013).20 This finding is another challenge to the stereotype image of Iraqi women, especially Kurdish women, depicted by most western and local media and studies.

Conclusion
The results of the present study indicated that the Barzani women have been through deep grief, numerous problems and challenges, and consequent mental and physical damages as a result of losing their spouses and sons to the Barzani genocide of 1983; therefore, despite their resilience in the face of the problems, they need to be given special assistance and attention particularly from nurses and medical personnel in hospitals.

References
Lived Experience of the Activists of Barzani Genocide: A Phenomenological Study

Muaf A. Karim¹, Tiran J. Piro², Hamdia M. Ahmed²
1. General Directorate of Erbil Health, Ministry of Health, Kurdistan Region of Iraq
2. College of Nursing, Hawler Medical University, Kurdistan Region of Iraq
Email address: muafabdulla82@yahoo.com

Abstract
Background and objective: Barzani genocide that occurred in 1983 led to death of 8,000 Barzani men. Since then, there have been numerous attempts by different activists to archive the events, make the crisis known worldwide, and help the survivors. The present study was a qualitative investigation into the Barzani genocide activists lived experience in order to come up with deeper understanding of their attempts and probable future measures to help survivors overcome their sorrow and finally prevent similar crises from happening in the future.

Method: Using a hermeneutic phenomenological method through Van Manen’s method, the transcripts of in-depth semi-structured interviews with nine activists of Barzani genocide were analyzed. The interviews were carried out at the activists’ home.

Results: Analyzing the interviews led to emergence of three main themes which were “Attempting to introduce Barzani genocide to international community”, “Archiving the event”, and “Alleviating the genocide survivors’ grief”.

Conclusion: According to the results of the present study, the activists’ attempts have been successful in introducing Barzani genocide worldwide, archiving the events involved with and leading to the crisis, and alleviating the survivors’ grief.

Keywords: Genocide; Barzani Kurds; Activists of Barzani genocide; Kurdistan Region of Iraq; Lived experience; Phenomenological study.

Introduction
On July 30th, 1983, as a part of the Anfal Campaign against the Kurds, Baath Regime abducted 8,000 Barzani men who were 14 years old and more and transferred them to southern Iraq.¹,² Later, it was officially announced by Saddam Hussein that they were “taken hell” and got “their punishment” shot in a desert in southern Iraq.³ Known as Barzani genocide, this crisis was one of the consequences of the Algiers Agreement of 1975 among Iraq, Iran, and Turkey that intended to establish a security belt within 10 to 20 km from the borderlines and transfer all of the population living around that region.⁴ Before the fall of the Baath regime, most of the documents available on Kurdish issues including Barzani genocide were collected and sent to the United States by the PUK and KDP. Those documents were mainly related to the Anfal Campaign.⁵ After the regime’s fall in 2003, human rights investigators, the US military, and other Iraqi parties could have easier access to Iraq; however, numerous concerns have been reported that some invaluable evidence was lost during the chaos following the collapse of the regime.⁶ Since then, there have been numerous attempts by Human Rights Watch, US government teams, and freelance journalists to find and collect reliable evidence on Barzani genocide.⁷,⁸ In every humanitarian crisis, activists including journalists, writers, and newspaper, TV, and radio reports can play a highly significant role before, during, and after the event. In this regard, it has been stated that broadcasting and publicizing the true lines leading to a crisis can result in a remarkable reduction in scope of the crisis during it and prevention of similar events in the future.⁹ To the best knowledge of the authors, the issues of the Barzani genocide has never been studied through the lived experiences of genocide activists. In this regard and in an attempt to depict the
activities of genocide activists in Kurdistan regarding the Anfal particularly Barzani genocide, the present qualitative study was carried out in order to analyze the attempts of activists of Barzani genocide through their lived experiences.

Method

Study design

The present investigation was a qualitative study that was carried out using Van Manen’s (1990) hermeneutic phenomenological method.10

Participants

The study was participated by 9 activists of Barzani genocide. The study sample was selected using convenience sampling method. The inclusion criteria were being a Barzani genocide activist, willingness to take part in the study, and having experience of collecting or and documenting evidence on Barzani genocide, and the exclusion criteria included lack of willingness to take part in the study and lack of experience of collecting information and evidence on the genocide. The activists were all males with an age range of 28-45. They were all Kurds who lived in the Kurdistan Region of Iraq.

Data collection

The required data on the participants’ lived experiences were gathered via in-depth semi-structured interviews with the activists of Barzani genocide during June to August, 2018. The participants were asked to select the place of interview, so they felt comfortable and gave as much information as they could. Accordingly, the interviews were carried out in their homes. Until data saturation was obtained and no new concepts appeared, data collection was continued. The interviews were begun by asking general questions such as, “What happened during Barzani genocide?”, “When did Barzani genocide happen?”, or “How did Barzani genocide happen?” and continued by posing questions like “What attempts have you made regarding documenting the events involved with Barzani genocide?” or “How has been your experience as a Barzani genocide activist throughout all these years?”. Sufficient time was given to each activist, so they could express all their lived experiences with as many details as possible. Each interview lasted for about 60 to 90 minutes. Following the activists’ permission, all of the interviews were recorded, and then transcribed and translated for further analysis.

Data analysis

The six methodological activities proposed by Van Manen (1990)10 were utilized to analyze the collected data (See Table 1).

<table>
<thead>
<tr>
<th>#</th>
<th>Van Manen’s Methodical Activities</th>
<th>The Researchers’ Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Turning to the nature of lived experience</td>
<td>The correspondence author is a genocide survivor who lost his father on 31 July, 1983, 4 paternal uncles, 2 maternal uncles, and 68 relatives in Barzani genocide when he was only 1 year and 7 months old.</td>
</tr>
<tr>
<td>2</td>
<td>Investigating experience as we live it</td>
<td>Selecting the participants who have activists with Barzani genocide</td>
</tr>
<tr>
<td>3</td>
<td>Reflecting on the essential themes which characterize the phenomenon</td>
<td>Using thematic analysis</td>
</tr>
<tr>
<td>4</td>
<td>Describing the phenomenon through the art of writing and re-writing</td>
<td>Writing and rewriting to create a phenomenological text</td>
</tr>
<tr>
<td>5</td>
<td>Maintaining a strong and oriented relation to phenomenon</td>
<td>Discussing the themes in relation to phenomena</td>
</tr>
<tr>
<td>6</td>
<td>Balancing the research context by considering parts and whole</td>
<td>Moving between transcripts and themes in relation of Barzani activists genocide</td>
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</table>
In so doing, the recorded interviews were transcribed verbatim, and the transcriptions and the recorded interviews were compared to make sure about their accuracy. Afterwards, they were translated into English by an experienced translator. After that, by breaking down the interviews into words, phrases, and sentences using detailed, holistic, selective approaches, the themes (units of meaning) depicting Barzani genocide activists’ lived experiences were extracted. The transcriptions were reread and scrutinized several times so as to understand the activists’ experiences thoroughly.

**Trustworthiness**

In qualitative studies, trustworthiness is defined as the level of adequacy or soundness. To ensure trustworthiness of a qualitative study, describing the data analysis procedure and justifying the reliability of the results are essential. In the present study, trustworthiness was ensured by benefiting from the complementary comments of the field experts, constructing a good relationship with the activists and obtaining their trust, carrying out the interviews at proper times and places, and reviewing the transcripts for several times. Moreover, the researcher’s father, 2 maternal uncles, and 68 relatives were Barzani genocide victims; therefore, he has lived all his life within the same context and has enough experience, which adds to the trustworthiness of the study and reliability of the collected data.

**Ethical considerations**

In order to observe the ethical considerations, the present study was ethically approved by the Ethics Committee of College of Nursing, Hawler Medical University (project No. 49, approval date: 48 June 2018). Moreover, the participants were provided with thorough explanation about the study’s objectives, data collection method, and confidentiality of their information. In addition they had the right and freedom to quit the study whenever they wanted to. Furthermore, the participants filled up and signed the informed consent forms and permitted the researchers to record the interviews. In order to keep the collected data anonymous, each participant was given a unique code (Activist 1, Activist 2, etc.), and by keeping the files containing the collected data in a safe place, the confidentiality of the data was ensured.

**Results**

Analyzing the transcripts of the interviews led to emergence of the following themes (1) Attempting to introduce Barzani genocide to international community, (2) Archiving the event, and (3) Alleviating the genocide survivors’ grief.

**Theme 1: Attempting to introduce Barzani genocide to the international community**

According to the analysis of the transcripts of the interviews with the participating activists of Barzani genocide, writers, researchers, and documentary directors have made enormous attempts to introduce Barzani genocide to the international community. In this regard, Activist 3 stated:

“We have built the Barzani Museum in the Barzani Graveyard in order to introduce the Barzani genocide to the global community. The museum familiarize the visitors with the crisis through pictures, books, brochures, and so forth. There are also some guides that help the visitors become more familiarized with the Barzani genocide.”

He continued:

“I have tried to run some exhibitions all over the world in order to introduce the Barzani genocide to the globe. An exhibition was held in Poland where I could familiarize the visitors with the crisis through books, journals, and brochures.”

He added:

“I have published a book on genocide of the Kurds in general, which particularly focuses on the Barzani genocide. This book is taught in secondary high schools.”

He also said:

“To introduce the crisis of Barzani genocide to both local and global communities, we have broadcasted some presentations on TV.”

He further explained:
“To raise the global awareness about the significance of Barzani genocide, we have written and published numerous books on the issue of Kurdish genocide. Some of these books are “Barzani genocide”, “The history of Kurdish genocide”, “Anfal and its psychological effects”, “Anfal and Kurdish genocide from the perspective of foreigners”, and so forth.”

With regard to the first theme, Activist 4 revealed:
“I have produced 3 short films about the Kurdish genocide. We have also held 8 documentary exhibitions in different cities such as Basra, Hawler, Slemani, and Soran.”

Moreover, Activist 5 stated:
“Scientific investigation into the Kurdish genocide based on the recorded evidence has played a significant role in familiarizing the Barzani genocide to both local and global communities. In this regard, I have written and published 3 research studies which were also presented in some special conferences on the Kurdish genocide.”

Theme 2: Archiving the event
According to the data analysis, there have been enormous endeavors to archive the accurate events involved with the Kurdish genocide. These attempts include making documentary films, and collecting documents and evidence by different organizations and individuals. Regarding this theme, Activist 1 said:
“As a genocide activist and a journalist, I have conducted numerous interviews with numerous local people and political characters and have written several news articles on the issue of genocide in Kurdistan especially the Barzani gendercide.”

Moreover, Activist 3 said:
“I have collected a large body of evidence on the Barzani genocide and held a home museum on this issue. I have also published a report on my home museum.”

Also, Activist 5 stated:
“We have written and directed some short documentary films such as “The Pilot” on Barzani genocide for Kurdistan TV, “We were genocide victims in the sky” for documentary section of Rudaw TV, and “Bahrka, from village to town”. We also won an award “The Pilot” as the best film in Slemani”

In addition, Activist 6 revealed:
“I have collected thousands of photo documents and events on the Kurdish genocide, Russian women, and Kurdish migration, and the archive is quite large and includes thousands of photos and evidence, ten audio cassettes, and eight video cassettes”

In the same regard, Activist 8 related:
“Unfortunately there are very few academicians and experts in this regard, as a result, preserving the documents related to this humanitarian crisis should be a part of the plan that needs to be sketched out.”

Theme 3: Alleviating the genocide survivors’ grief
Allocating a special budget to help the survivors was also referred by the participants as a good strategy to help alleviate their deep grief. In this regard, Activist 1 said, “To relieve the deep sorrow of the genocide survivors, we need to adopt appropriate measures.” Also, Activist 7 stated:
“Helping the survivors of such national events is one of the most significant steps that the government needs to take seriously because this step will lead to formation of national trust and unity and strengthen the community. It also alleviates the survivors’ deep grief.”

Moreover, Activist 9 said:
“Genocide is a legal issue; therefore, it should be one of the major points in the work plans of the government. In this regard, special budget and professional diplomats and personnel need to be assigned, and short- and long-term plans need to be sketched out in order to alleviate the survivors’ sorrow. Also, local NGOs and civil societies need to
establish collaborative connections with global NGOs especially those located in Europe that has experienced two world wars and similar events and use such experiences and measures to help the crisis survivors.”

Discussion
According to the results of the present study, the Barzani genocide activists’ lived experiences were interpreted as three main themes namely, “Attempting to introduce Barzani genocide to international community”, “Archiving the event”, and “Alleviating the genocide survivors’ grief”. However, since there are no similar studies on the issue of Barzani genocide based on the lived experiences of the activists, the results of the present study and the elicited themes cannot be compared to any previous investigations. However, there are some points that need to be mentioned with regard to the obtained results.

As mentioned above, the participating activists referred to their attempts in order to introduce the issues of Kurds, especially Barzani genocide, to people all over the world. By doing so, they aimed to attract the international attention toward those crises that Kurds have been through and whereby prevent other possible similar events from happening in the future. One of the most common means to publicize crises worldwide is mass media which, as mentioned by the activists in this study, has been employed by Barzani genocide activists to introduce the issue to the world. The role of media in intensifying or soothing humanitarian crises has been referred to in the Rwandan genocide by Thompson (2007) and Stavros (2016). In the study carried out by Mitchell (2007), it is reported that local and global media can play a significant role in publicizing, intensifying, and soothing the Rwandan genocide.

The second theme that emerged from analyzing the transcripts of the interviews was “archiving the event”. In the case of Rwandan genocide, there have also been numerous attempts to archiving the events involved with the crisis in order to help next generations remember those days and commiserate with the family of the victims. In the same regard, Dr. James Smith, Chief Executive of the Aegis Trust, stated that archiving genocide of Rwanda can provide invaluable evidence for the present and future generations to learn how genocide develops so as to understand how it may be prevented better.

The final theme in the present study was alleviating the genocide survivors’ grief. In this regard, the activists stated that their attempts and those adopted by the government have helped Barzani genocide survivors overcome their deep sorrow of losing their family members and relatives. In their study, Ahishakiye et al (2015) indicated that social support can help genocide survivors overcome their stress caused by the crisis. Moreover, Rubanzana et al. (2014) reported that employing evidence-based public health measures can reduce the incidence of suicide among genocide survivors.

Conclusion
According to the results of the present study, the Barzani genocide activists’ lived experiences were interpreted as three main themes namely, “Attempting to introduce Barzani genocide to international community”, “Archiving the event”, and “Alleviating the genocide survivors’ grief”, which indicates the activists’ attempts to document and record the true sides of Barzani genocide and help the survivors get over their deep grief. The results of the present study can be utilized by governmental bodies and healthcare practitioners in order to help the survivors experience less stress and sorrow.

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Biochemical Mechanisms and Methodologies Applied to the Study of Posttraumatic Stress Disorder (PTSD)

Daniele Suzete Persike
Suad Yousif Al-Kass
Department of Medicinal Chemistry, College of Pharmacy, University of Dohuk, Kurdistan Region, Iraq.
Email address: daniele_persike@protonmail.com

Abstract
PTSD has been considered as a syndrome with multiple faces due to the complexity of its pathophysiology. There is a need to elucidate the biochemical mechanisms involved in the disease in order to improve its diagnosis, prognosis, and treatment. Believing that the university has the responsibility to help the community, and hoping for the development of research devoted to this matter, the purpose of the present study was to present a brief review about the main biochemical mechanisms involved in PTSD and the methodologies applied to assess the disease. The review was done based on recent literature. According to the studies PTSD presents pre-exposure vulnerability factors, besides trauma-induced alterations. The disease was found associated with hypothalamic-pituitary-adrenal axis and hypothalamus-pituitary-thyroid axis dysfunctions. Alterations of sympathetic nervous system activity play a role in PTSD by releasing norepinephrine and epinephrine. The release of cortisol from the adrenal cortex amplifies the SNS response, reducing it later through negative feedback mechanisms. This response leads to a decreased level of cortisol in patients with PTSD. The negative feedback contributes to neuroendocrine alterations, promoting structural brain changes that culminate in PTSD. Abnormal levels of serotonin and dopamine have been found in the disease. Mechanisms such as the induction of neuroinflammation and alterations of mitochondrial energy handling were also associated with PTSD. Controversies can be found regarding to which biomarkers would be possible for the disease. Therefore, there is a need for studies in order to find biomarkers for PTSD.

Keywords: PTSD; Stress; Trauma; Homeostasis; Biomarkers.

Introduction
The post-traumatic stress disorder (PTSD) is a severe anxiety disorder caused by exposure to an event with actual, threatened, or perceived death or serious injury, or a threat to the physical integrity of oneself or others that results in significant psychological trauma. In Iraq, the possibility of having an increased incidence of PTSD should be taken into consideration due to frequent extremes adversities faced, especially wars and internal conflicts. These events make the disease a relevant mental health problem among the population. In 2017, the “International Organization for Migration” identified over 3 million Iraqis internally displaced by violence. The Yazidi’s ancestral homeland in northwestern Iraq was attacked by the Islamic State of Iraq and Syria (ISIS), in 2014. During that time the Yazidis living in Sinjar found refuge in different regions of Kurdistan Independent Region. As a result of this context, there are millions of people living in internally displaced people (IDP) camps and villages in many different areas of Kurdistan, including its capital Erbil, and the city of Dohuk. Among other atrocities, ISIS abducted thousands of women and girls and traded many of them into sexual slavery. To make it worse is estimated that the prevalence of PTSD following trauma is higher in women (10-13%) than in the general population (5 and 10%). In many IDP families, there are individuals who have been rescued from ISIS captivity. In this dramatic context, PTSD represents a mental
health problem that urges to be better understood and treated. Therefore, the purpose of the present article was to do a brief review of the main biochemical mechanisms and methodologies applied to assess PTSD. This review was done based on data collected from recent literature.

**Literature Review**

The peripheral biologic correlates of PTSD to date encompass genes, epigenetic regulation, neuroendocrine factors, inflammatory markers, autonomic risk and resilience, and sleep disturbances. Some biologic features constitute preexposure vulnerability factors such as a polymorphism in the *FKBP5* gene, environmental exposure, socio-cultural beliefs and heart-rate variability, pre-conditioning, among others. However others biologic factors might reflect trauma-induced alterations such as immune changes, neuroinflammation, and postexposure epigenetic regulation.

**Orchestrated participation of SNS, HPA and HPT in the development of PTSD**

Neurobiological findings showed that PTSD is associated with hypothalamic-pituitary-adrenal axis dysfunctions and other brain-related structures such as prefrontal cortex, hippocampus, and amygdala, which are related to appropriate contextual processing. The hypothalamus-pituitary-thyroid (HPT) axis was found also dis-regulated in the presence of the disease. Research examining acute biological risk factors for PTSD has implicated HPA hypoactivity in addition to SNS hyperactivity. These two stress response systems may have independent effects on the development of PTSD symptoms, with lower cortisol levels associated with avoidance behaviors and higher catecholamines associated with reexperiencing and hyperarousal symptoms. A hypo-responsive hypothalamic-pituitary axis and hyper-responsive catecholamine system (persistently elevated blood norepinephrine levels and lower than appropriate glucocorticoid levels) have been understood as the main responses to PTSD. Taken together those responses indicate that the HPA axis has grown resistant to the effects of cortisol.

Meta-analytic findings regarding peripheral indicators of noradrenergic activity indicate that PTSD is associated with elevated resting heart rate, skin conductance, and blood pressure (both systolic and diastolic). Long-term hair cortisol levels and lower cortisol stress reactivity were considered predictive of a greater increase in PTSD symptomatology. According to Yehuda two-factor model of acute biological risk for PTSD, either SNS hypersecretion or cortisol hyposecretion during trauma exposure are capable of triggering PTSD symptoms. The decreased levels of cortisol, the increased responsiveness of glucocorticoid receptors, the increased sensitivity of the HPA negative feedback inhibition and its progressive sensitization are the neuroendocrine alterations specifically associated with the development of PTSD. In addition to having inappropriately low serum cortisol levels and high epinephrine and norepinephrine levels, patients with PTSD also have mitochondrial dysfunctions and other hormonal abnormalities. These include subclinical hypothyroidism or hyperthyroidism and higher levels of brain natural opioids. Biochemical and sustained neurohormonal abnormalities are likely to influence the structural brain changes, particularly in the amygdala and hippocampus, which are characteristics of patients with PTSD. Since SNS activation has been suggested to moderate cortisol’s effect on memory two factors can be analyzed. First, salivary alpha-amylase (sAA) and its interaction with cortisol in a synergistic fashion to predict the number and vividness of intrusive memories. Second, the cardiac defense response (CDR) which is a heart rate (HR) response to a sudden onset of loud noise. Baseline assessment of the psychological diathesis (i.e. psychiatric history and peritraumatic distress and dissociation), and the biological diathesis (i.e. cortisol, norepinephrine, epinephrine, C-reactive protein, total cholesterol, HDL cholesterol, glycosylated haemoglobin, waist-to-hip ratio (WHR), body mass index, diastolic and systolic
blood pressure and heart rate during the first week and at 1, 4, and 12 months post-trauma has shown the psychological diathesis as a better predictor of short-term dysfunction whereas biological diathesis has also been predictive of development and maintenance of PTSD.\textsuperscript{36,37}

Furthermore, several lines of evidence point toward accelerated age-related processes in PTSD, reflected for instance in shortened telomere length\textsuperscript{38}, enhanced DNA damage\textsuperscript{39} or an altered N-glycosylation profile.\textsuperscript{40}

Recent work has shown that patients diagnosed with PTSD besides the lower plasma cortisol, have lower prolactin and TSH levels compared to the comparison group.\textsuperscript{20} The neuropeptides oxytocin (OT) and arginine vasopressin (AVP) have been associated with both regulating fear and neuroendocrine stress responsiveness and social behaviour.\textsuperscript{41} Basal salivary OT and AVP levels were measured in trauma-exposed male and female with and without PTSD. Saliva samples were collected during rest and OT and AVP levels were determined by radioimmunoassay. The findings indicate potential dysfunctioning of the OT system in male PTSD patients.\textsuperscript{41}

**Oxidative stress in PTSD pathophysiology**

Oxidative stress has been shown as paying an important role in PTSD. The brain is highly sensitive to oxidative stress as it consumes about 20–30\% of inspired oxygen, contains high levels of both polyunsaturated fatty acids (PUFA) and redox transition metals and has lower antioxidant defenses compared to other organs. All these factors make the brain an ideal target for free radical attack.\textsuperscript{42} Of all the brain cells, neurons are particularly vulnerable to oxidative insults due to low levels of reduced glutathione.\textsuperscript{42,43}

The damage to brain membrane lipids is an early event. In thirty minutes after trauma, higher levels of MDA and 4-HNE can be detected, whose levels are maintained elevated 72 h after the injury onset.\textsuperscript{44-46} The peroxidation of membrane lipids can change the membrane function by modifying its fluidity, permeability, metabolic processes, and ionic equilibrium.\textsuperscript{47} Damage to mitochondrial membranes can also increase the production of ROS, besides generating mitochondrial dysfunction. Most studies analyzing the oxidative damage to lipids in animal models find a correlation between this parameter in conjunction with cognitive damage, installation of edema, and volume of injury. These data suggest that the damage to lipids of biological membranes can be an important event in the pathology of PTSD.\textsuperscript{48,49}

In an animal model of PTSD, inflammation and oxidative stress were reported to play a critical role in the development and exacerbation of PTSD.\textsuperscript{50} Oxidative damage to lipids can be estimated with assays for compounds called isoprostanes that is derived from either enzymatic, by cyclooxygenase, or nonenzymatic oxidation of arachidonic acid.\textsuperscript{51} F2-Isoprostanes are widely used because they are chemically stable, specific products of peroxidation, present in detectable amounts in all normal tissues and bodily fluids, and unaffected by lipid content in the diet is considered an excellent marker of oxidative stress in vivo.\textsuperscript{52} Some clinical studies have observed a marked increase of cerebral neurotransmitter glutamate in PTSD.\textsuperscript{53-55} Stress induces glutamate release, which is recognized as an important mediator of excitotoxicity. Glutamatergic pathways may have an important role in stress-related hippocampal degenerative pathology, neuronal damage and cognitive deficits seen in patients with PTSD.\textsuperscript{56} A positive correlations between antioxidant enzymes activities such us SOD, GPx and MDA, with the severity of PTSD has been found. This correlation may support the involvement of mild oxidative stress in the pathogenesis of PTSD.\textsuperscript{57}

**Inflammation in PTSD pathogenesis**

Observational studies largely support an association of PTSD with increased peripheral inflammation.\textsuperscript{15} A large cross-sectional community-based study found that patients with PTSD had about twice the odds of those without this disorder of elevation in the inflammatory marker, C-reactive protein (CRP).\textsuperscript{15} In most such studies PTSD cohorts have had significantly greater
plasma levels of CRP or IL-6, alteration of Tumor necrosis α and IL1β among other inflammatory markers, than did controls.58-61
It is plausible that the observed association between PTSD and inflammation is due to PTSD-related stress hormone dysregulation leading to alterations in immune, and therefore inflammatory signaling.60,62-64 However, it remains possible that rather than PTSD promoting inflammation, inflammation places individuals at heightened risk for developing PTSD in the setting of trauma – in other words, the direction of causality runs from inflammation to PTSD rather than from PTSD to inflammation. A marker of peripheral inflammation, plasma CRP, may be prospectively associated with PTSD symptom emergence, suggesting that inflammation may predispose to PTSD.

Impact of PTSD on coming generations
Since 1918 has been demonstrated that 74% of 100 patients experiencing war neuroses showed a family history of psychoneurosis compared to none of 100 matched comparison subjects.65 The concept that familial contributions can improve the likelihood of developing PTSD has found reinforcement by studies showing a relationship between psychological responses in trauma survivors and family history of psychopathology in veterans, families of soldiers and traumatized civilians exposed to war or natural disaster.66-69 An interesting study proceeded in Holocaust survivors has suggested that their children constitute a high-risk group for PTSD since they were found to have a greater prevalence of lifetime PTSD compared to demographically similar persons.70 Additionally, adult children of Holocaust survivors also showed a greater prevalence of mood and other anxiety disorders.70 Therefore PTSD in children of Holocaust survivors appeared to be strongly related to parental PTSD.

According to the studies was concluded that parental rearing practices may be substantially affected by the presence of PTSD in one or both parents. The effect of maternal behavior has been shown to persist across multiple generations and to be associated with increased hippocampal glucocorticoid receptor expression.70 This effect has been understood as a nongenomic transmission of stress. In such situations as shown in the study with Holocaust survivors cortisol level of offspring with both parental PTSD and lifetime PTSD was significantly different from that of offspring with no parental PTSD and no lifetime PTSD and that of comparison.70 Therefore, parental PTSD, has been considered a putative risk factor for PTSD, and it appears to be associated with low cortisol levels in offspring, even in the absence of lifetime PTSD in the offspring.70 The findings suggest that low cortisol levels in PTSD may constitute a vulnerability marker related to parental PTSD.

Methodologies applied to assess PTSD
Baseline assessment of the psychological and biological diathesis

1- Psychological diathesis:
Semistructured Diagnostic Interviews:
The Clinician-Administered PTSD Scale (CAPS) is one of the most widely used semistructured clinical interviews for the assessment of PTSD.71

2- Biological diathesis:
Evaluation of the following parameters: cortisol, norepinephrine, epinephrine, C-reactive protein, total cholesterol, HDL cholesterol, glycosylated haemoglobin, waist-to-hip ratio (WHR), body mass index, diastolic and systolic blood pressure and heart rate during the first week and at 1, 4, and 12 months post-trauma.36,37
Physiological differences distinguish between individuals with and without PTSD can be analyzed:71
a) at rest,
b) perceiving standardized trauma cues (e.g., Vietnam veterans viewing general images of Vietnam), or
c) perceiving idiographic trauma cues (e.g., hearing a script describing the individual participant’s traumatic experience).

Physiological arousal and reactivity are viewed as potential markers of PTSD to include:71-73
- heart rate;
- skin conductance (sweat gland activity);
- cardiac defense response (CDR) and
- facial electromyography (a measure of muscle contractions in the face).

* Heart rate and skin conductance have emerged as particularly reliable markers of PTSD status.

Neuroendocrine markers using samples of blood or saliva:
- plasma and saliva cortisol17,26
- plasma adrenocorticotropic (ACTH)17,26
- prolactin and TSH levels20
- leukocyte glucocorticoid receptor (GR) density17,19
- corticotropin-releasing factor (CRF)17,19

Cortisol’s effect in memory:
- salivary alpha-amylase (sAA)74
- cardiac defense response (CDR) which is a heart rate (HR) response to a sudden onset of loud noise34,35

Regulation of fear, neuroendocrine stress responsiveness and social behaviour:
- Basal salivary neuropeptides oxytocin and arginine vasopressin during rest analyzed by radioimmunoassay41

DNA damage and aging process:
- telomere length38
- DNA damage39
- N-glycosylation profile1.

Markers of oxidative stress:
- malondialdehyde (MDA)75-77
- 4-hydroxy-2-nonenal (4-HNE)75-77
- acrolein76,77
- F2-isoprostanes51,52
- glutamate53-56

Inflammatory markers:
- C-reactive protein (CRP)15
- IL1β, IL-6, Tumor necrosis α58-61
Conclusion
Especially in places as Iraq where the population has been hardly affected by traumatic events there is an extreme calling for research initiatives what could bring new knowledge about the pathogenesis of PTSD and potential treatment targets. PTSD has very complex pathophysiology showing similarities with other psychiatric disorders, such as major depression, at some biochemical pathways, what can result in misdiagnose, and affecting the treatment. Therefore, there is an urgent need for studies that would allow a better understanding of the disease and perhaps lead to biomarkers for PTSD. The existence of specific biomarkers for PTSD could facilitate its diagnoses, prognoses and treatment. With this review, we hope to highlight this subject and encourage researchers to devote themselves to this challenging matter.

References


Health Challenges of Women of Martyr Families in Erbil City

Hamdia Mirkhan Ahmed, College of Health Sciences, Hawler Medical University
Email address: hamdia.mirkhan@nur.hmu.edu.krd

Abstract

Background and objective: During the last 100 years ago Iraq generally and Kurdistan region particularly underwent wars which led to the loss of men from families. Nowadays in Kurdistan region, there are 20000 martyrs families. This study aimed to identify women’s satisfaction and expectations about health services provided in Medical Center of Martyr families in Erbil city.

Methods: A qualitative design, based on a thematic analysis approach was conducted on 34 women who met the inclusion criteria of the study which was either mother, daughter, wife or sister of martyr and attended Medical Center of Martyr Families in Erbil city during Jan to Aug 2018. Non-probability, convenient sampling was used for selecting them and they were interviewed in four focus groups.

Results: Four main categories could be extracted as a result of the conducted analysis: 1) Unsatisfied with services, 2) Economical factors, 3) Being forgotten by government and society and 4) Respectful health care providers' behavior.

Conclusions: The women of martyr families were not satisfied with the health services of the center and they had expected more from government to respect them and provide their emotional, social, economic and physical needs.

Keywords: Women; Health; Martyr families; Satisfaction; Expectation.

Introduction

Women, who are key in maintaining healthy families, access the health system more than men, both for themselves and on behalf of their children. Many become pregnant and give birth, a significant health event, then typically become their child’s primary caregiver, a role that greatly influences household health overall. Elder and long-term care issues affect women more often because they live longer; have higher rates of disability and chronic health problems; and lower incomes than men on average, which puts them at greater need for state and community resources, such as Medicaid.\(^1\) Women's experience of health and disease differ from those of men, due to unique biological, social and behavioral conditions. Biological differences vary all the way from phenotype to the cellular, and manifest unique risks for the development of ill health.\(^2\) The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".\(^3\) Women's health is an example of population health, the health of a specifically defined population.\(^4\) Women's health has been described as "a patchwork quilt with gaps".\(^5\) Although many of the issues around women's health related to their reproductive health, including maternal and child health, genital health and breast health, and endocrine (hormonal) health, including menstruation, birth control and menopause, a broader understanding of women's health to include all aspects of the health of women has been urged, replacing "Women's Health" with "The Health of Women".\(^6\) The WHO considers that an undue emphasis on reproductive health has been a major barrier to ensuring access to good quality health care for all women.\(^1\) Conditions that affect both men and women, such as cardiovascular disease, osteoporosis, also manifest differently in women.\(^6\) Women's health issues also include medical situations in which women face problems not directly related to their biology, such as gender-differentiated access to medical treatment and other socioeconomic factors.\(^7\)

During the last 100 years, Iraq generally and Kurdistan region particularly underwent wars which led to the loss of men from families. Nowadays in the Kurdistan region, there are 20000
martyrs families. In most of them, the women take responsibly of family support and even custodian family supporter. This study aimed to identify women's satisfaction and expectations about health services provided in Medical Center of Martyr families in Erbil city.

**Methods**

A qualitative design, based on a thematic analysis approach, was used to reach the aim of the study. Content analysis is a systematic coding approach, which can be used to identify and describe a large amount of textual information in order to determine patterns of communication. The sample includes 34 women who met the inclusion criteria of the study which was either mother, daughter, wife or sister of martyr and attended Medical Center of Martyr Families in Erbil city during Jan to Aug 2018.

Non-probability, convenient sampling was used for selecting them and they were interviewed in four focus groups (G1=7, G2=8, G3=8, G4=11). In order to collect data, semi-structured interviews conducted, tape recorded, and transcribed verbatim. The researcher started each interview by asking sociodemographic data and three open-ended questions: "1- which health services you satisfied and not satisfied within the center? 2- what are your expectations from the government to improve the services for martyr families? 3- what are the barriers to health services for martyr families? ". Subsequent questions posed based on the respondents' descriptions of their experiences. All interviews conducted in the center and the subjects' native language (Kurdish). The interviews continued until data saturation occurred. Medical Center of Martyr Families is the only center which provides health services for all martyr families in Erbil Governorate which belongs to the Ministry of Martyrs and Anfal. The Ethics Committee of Hawler Medical University /College of nursing approved the study proposal and corroborated its ethical considerations. All participants have informed about the purposes and the methods of study. The permission to tape record the interviews obtained from the participants. Their participation in the study was voluntary with verbal consent of them. The proposal of the study was approved by the Scientific Committee of the College of Nursing, Hawler Medical University.

**Results**

Thirty four women with a mean age of 45.85 ± 13.11 years included in the present study. Relationship with martyr were as following: wife (12, 35.3%), mother (4, 11.8%), sister (12, 35.3%), daughter (6, 17.6%). Mean years of martyr person was 23.52 ± 9.1. The majority (67.6%, 85.3%) of women were illiterate and housewife, respectively. According to the results of the present study, the researchers could extract four main categories as a result of the conducted analysis: 1) Unsatisfied with services, 2) Economical factors, 3) Being forgotten by government and society, 4) Respectful health care providers' behavior.

**Unsatisfied with services**

Almost most of the women in the groups were not satisfied with all services provided by the center because of deficiencies in providing their health needs. Although they mentioned that in general the presence of the center is a good opportunity for martyr families and we use their facilities as much as possible, but specifically they were not satisfied with those needed services which obligate to seek them from private clinic or hospital. Therefore this category includes subcategories like “insufficient health care resources and facilities,” ”no availability of all specialists,” and ”inattention of government to their health needs." The following are examples of women's expression:

G1P3: "In general we are satisfied, but we want that the time of working of the center be longer and all medical services be available like sonar, x-ray, other specialists, operation room, senior doctors like nephrologist.”

G1P7: "We need a center to have all specialists in orthopedic and neurology, like a big hospital, because our financial status does not allow us to use medical services by other
private hospital or clinic. When I go to a private clinic, the physicians ask me to take sonography or x-ray and do many lab tests in addition description of drugs which are very expensive for us."

G2P1: "services are good here, but if other specialists be present it would be much better of course."

G2P4: "I am generally satisfied with the services in this center but always drugs are not very good in quality and I do not take benefit from them. This is good that sonography and hypertension drugs are available. X-ray and operation room is not available. One center is not enough. Each area in this city needs one center. Time of working at the center is good. This center just only gives us a simple medication. This is my attitude and I have no information regarding the problem of other people."

G4P5: "It is our right to get all treatment in this center. They refer us to other hospitals because all services are not available here, but other health settings give no attention to us as martyr family."

G4P10: Government did not do anything for us, what they do? Only they gave one piece of land and then they throw us alone. Regarding health, they also do nothing, just this small center.

Economic factors
Almost all the women complained from insufficient financial support by government and in results, they have lost the opportunity in seeking health care proficiently. They mentioned that if they had good financial resources, they would seek health care in good quality in other private clinic or hospital, even outside of the country. Sub themes of this category include "loss breadwinner of the family," "lack of job opportunity" and "inadequate financial support."

G4P9: "Staff of this center are good, but we wish to give more service to martyr families. Some drugs are not available here and we have to buy it from outside. If they help us from the financial side, it would be better. Some martyr families rent a house like me and I have no enough money to buy my medicine, so I neglect them."

G3P1: "If we would have enough salary we could to get health service in the private sector because this center has no all facilities."

G1P7: "I do not know what to say, I would like that the government supports us in such a way that we do not go to other hospitals for our health needs. Martyr families have to have their special center with all facilities."

G2P4: "When a family loss their support person who had provided the financial needs and other supports, now they are without this support person, so they need to be at attention by the government. For example, when one member of the family gets cancer or chronic disease, it has to have special health services for martyr's family."

G2P8: “All martyr families have no financial support to seek health care.”

G1P6: "Many times my mother said why you do not go to this center and I reply that this center has few things, I go there for what? My mother has many diseases like diabetes, disk and heart diseases; it is necessary that government have financial support for them to seek care for herself."

G3P3: "It is our right to have all financial support. I want from the government that if the mother and father of martyr need treatment outside of the country, they provide facilities for that. My mother can cure in Jordan, but we can not go there because we can not do that."

Being forgotten by government and society
Because of not having sufficient financial support and providing necessary health services to them, women of martyr's families had felt that the government ignored them despite sacrificing their family members. They expressed that the situation is not the same for all martyr's families as some of them were supported fully from all aspects of financial, social and health. Sub
themes of this category include: "inattention to educational needs of a family member," "inattention to spirituality position in society" and "discrimination."

G1P7: "I do not know what to say, I would like that the government supports us in such a way that we do not go to other hospitals for our health needs. Martyr families have to have their special center with all facilities."

G2P3: "I do not know what to say, I would like that the government supports us in such a way that we do not go to other hospitals for our health needs. Martyr families have to have their special center with all facilities."

G3P5: "For those who have not enough money government have to support with a good salary and establish a big hospital sometimes I feel I am a beggar."

G3P4: "Health is not the only hospital. We have no suitable home only we have two rooms."

G1P2: "Government ignored martyr families, but all are not the same. Some of them are provided with all facilities."

G1P5: "My financial status is not good and I can not support my daughter for going to college."

G2P8: "We give our dearest person for this country, but they do not respect that for full services."

G4P11: "For some martyr's family member there is money to treat outside country, but for some not, there is discrimination between martyrs' families."

Respectful health care providers' behavior

Almost all of the study sample satisfied with health care providers' communication and behavior. Sub themes of this category are: "warm welcoming," "well listening" and "giving advice and referring."

G2P5: "The staff of the center especially the director are good persons, they do anything they can."

G1P6: "Staff of the center always welcome us and they guide us and they advise what to do if the service is not available in the center."

Discussion

Through the present study, the researcher attempted to identify women's satisfaction and expectations about health services provided in Medical Center of Martyr families and their health challenges by expressing their feeling and attitude through focus group discussion. Results indicated that they were not satisfied with health services for martyr's families because of non-availability of all necessary health care in this center. Because of losing a dear person from their families they expect more respect from the government by providing complete health services and treatment in good quality.

A review study regarding women’s health and status in Kurdistan concluded that women in the Kurdistan region of Iraq are affected by different health, social and cultural problems. Without a doubt the women’s health status can be worse among families that loss their dearest person and in most cases their financial support person.

Iraqi people especially Kurdish people confronted many wars during the last 50 years. Most of the families lost their men. The wars and armed conflicts in many regions of the world and especially in the Middle East have an eloquent impact on all life's happenings most especially in areas affected. Wars destroy community infrastructure such as health, education and other social services sectors. As of present, the ongoing conflicts in the Middle East had left a significant impact on the family and the individual in the areas affected. In the family, it has led to disintegration and roles change. At the individual level, it has impacted negatively in terms of psychology, social and physical wellbeing. Women and children are the most affected by traumatic events of war and they are the most vulnerable to all types of exploitation and abuse.
Although in the present study the effect of wars and losing family member were not examined it is clear from other literature that many aspects of war affect women and girls disproportionately. According to recent studies on life expectancy among unarmed civilians caught in armed conflict, women are the primary adult victims of war. As the results of the present study showed that women’s of martyr families need serious attention by stakeholders to providing many health facilities including hospital-based care, presenting different specialist, different lab tests and treatment. Very few studies conducted on health status and challenges of women from martyr’s families. Therefore supporting the results is limited.

**Conclusions**

The women of martyr families were not satisfied with the health services of the center, and they had expected more from government to respect them and provide their emotional, social, economic and physical needs.

**References**

Delayed Skin, Neurological and Ophthalmological Complications of Chemical Weapons in Peshmargas

Dindar Sh. Qurtas, Hawler Medical University
Abdullah F. Ahmed, KBMS
Barzan A Ahmed, DOH, Erbil Teaching Hospital
Barzhang Q Saleem, DOH, Pirmam General Hospital
Email address: dindar.qurtas@med.hmu.edu.krd

Abstract
Background and objective: From 2014 to 2017 when the Islamic State of Iraq and Syria (ISIS) occupied some areas of Iraq, they used Chemical weapon against Kurdish soldiers (Peshmargas) at battle areas, which lead to tens of casualties. A chemical agent is "a chemical substance which is intended for use in military operations to kill, seriously injure or incapacitate people because of its physiological effects. We aimed to study delayed complications of chemical weapons used by ISIS in Iraq, as up to our information no studies have been performed on delayed complications in those victims.

Methods: This is a descriptive study, we evaluated 163 male patients who were exposed to chemical agents used by ISIS against Kurdish Peshmargas in Iraq from 2015-2016. Interviews were arranged in medically equipped centers. Each patient was interviewed separately face-to-face, for about 15–20 minutes. The data was entered into, and analyzed with, SPSS program version 22.

Results: The mean age of victims and SD was 34.9±9.6 years. Right after the chemical attacks, the most common clinical manifestation was nausea (76.7%). The most common delayed complications were itching, localized hair loss and xerosis (skin), Fatigue, headache, vertigo and tremor (neurological) and itching, eye redness and eye tearing (eyes).

Conclusion: Multiple delayed skin, neurological and eye complications were identified among Peshmargas exposed to chemical attacks. Further studies are required to evaluate other systems delayed complications including respiratory as well as follow up of victims for a longer term for the appearance of expected complication.

Keywords: Chemical weapons; Sulfur mustard; Peshmargas; Delayed complications.

Introduction
From 2014 to 2017 when the Islamic State of Iraq and Syria (ISIS) occupied some areas of Iraq, they used the chemical weapon (CW) mostly mustard and less often chlorine gases against Peshmargas (official Kurdistan Region army soldiers) at battle areas, which led to tens of casualties. Chemical weapons are cheap, can cause mass casualties, and are relatively easy to produce, even by developing nations. Chemical warfare has been widely condemned since it was first used on a massive scale during the First World War. Chemical agent is “a chemical substance which is intended for use in military operations to kill, seriously injure or incapacitate people because of its physiological effects”, Chemical weapons can be classified according to their mode of action or by the time they remain active in the environment (persistence) and lethality, it can be delivered in artillery shells or missiles, by aerial bombing, or by spraying. While chemical agents have been used for decades in military conflict, it is only in the last two decades that increased attention has been paid to the acute and chronic health effects associated with exposure to these agents. They have caused considerable damage to mankind and are still a major concern worldwide, especially as a terroristic menace. Sulfur mustard (SM) is a toxic alkylating chemical warfare agent and has been the most effective and widely-used chemical agent in the past century. Injuries caused by SM are
usually nonfatal. Mortality from exposure to SM was only 3% during the first world war and 4% in the Iran–Iraq conflict. However, the long-term complications of SM cause significant morbidity. SM is a powerful blistering agent, to the extent that a 0.1-MI drop of pure SM contains 20000 times the minimum dose required to blister the skin.

Vesicants (sulfur mustards, lewisite, and nitrogen mustards) are chemicals that cause blistering of the skin. Developed as chemical warfare agents, their biological activity is complex and not fully understood. These vesicants, whether in liquid or vapor form, are capable of causing injury to most tissue. Contact with the skin results in erythema and blistering. Exposure to vapors produces ocular and respiratory effects that occur at exposures below those causing dermal effects. Systemic and long-lasting effects may occur, especially following acute exposures that result in severe injury. Multiorgan involvement and fluid loss shock resulting in death may follow severe exposures. As alkylating agents, all of the mustards are known to be potential carcinogens.

We aimed in this study to identify known delayed skin, neurological and eye complications of CW used by ISIS against Peshmargas forces, as up to our information no studies have been performed on delayed complications in those victims.

**Patients and Methods**

In this cross-sectional descriptive study, we evaluated 163 Peshmargas in Erbil and Duhok Governorates units, who were exposed to chemical agents used by ISIS from 2015-2016, and the post-attacks period was 28 to 44 months.

After official coordination and permission from Ministry of Peshmargas – Kurdistan Region Government, we asked the victims who were exposed to those chemical agents to enroll in our study.

One hundred sixty-three victims gave informed consent to participate in the study. Interviews were arranged in medically equipped centers. Each victim was interviewed and examined separately by a team of one to two specialist of each of dermatology, neurology and ophthalmology specialties face-to-face, for about 15–20 minutes. The same team, whose members were trained in data collection and data entry, were involved in data collection and data entry.

Demographic data were collected with regard to age, sex, level of education, marital status, socioeconomic and residency of the victims. Additionally, data were collected on time, location and environment of chemical agent exposure.

The data was entered into, and analyzed with, SPSS program version 22.

**Results**

The results reveal that the mean age of victims and SD was 34.9 ±9.6 years. Of them, 81.6% were married. There levels of education were; 26.4% illiterate, 44.8% primary school, 19.6% secondary school, 6.1% university/institute and 3.1% military academy. About their socioeconomic status, 74.2% were poor, 22.7% were moderate and 3.1% were good. 63.8% of the victims were smokers. More victims were from urban areas (60.7%) than from rural areas (39.3%).

Right after the chemical attacks, the most common clinical manifestations were nausea (76.7%), shortness of breath and cough (71.8%), tearing of eyes (64.4%) and burning sensation of eyes (63.2%) as shown in more details at Table 1. About the delayed skin manifestations of those exposed to the attacks, the most common were itching, localized hair loss and xerosis with percentages of 31.9%, 10.4% and 5.5% respectively. The rest of the symptoms with fewer frequencies are shown in Table 2. Fatigue (44.8%), headache (44.2%), vertigo (28.8%) and tremor (27.0%) were among the most common delayed nervous system manifestations of chemical weapons (Table 3).
Table 1: Clinical manifestations of Peshmargas right after the chemical attack

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dizziness</td>
<td>35</td>
<td>21.5</td>
</tr>
<tr>
<td>Headache</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>Nausea</td>
<td>125</td>
<td>76.7</td>
</tr>
<tr>
<td>Vomiting</td>
<td>61</td>
<td>37.4</td>
</tr>
<tr>
<td>Malaise</td>
<td>32</td>
<td>19.5</td>
</tr>
<tr>
<td>Fever</td>
<td>42</td>
<td>25.8</td>
</tr>
<tr>
<td>Skin redness</td>
<td>37</td>
<td>22.7</td>
</tr>
<tr>
<td>Burning sensation of the skin</td>
<td>50</td>
<td>30.7</td>
</tr>
<tr>
<td>Blistering of the skin</td>
<td>9</td>
<td>5.5</td>
</tr>
<tr>
<td>Eye pain</td>
<td>31</td>
<td>19.0</td>
</tr>
<tr>
<td>Tearing of eyes</td>
<td>105</td>
<td>64.4</td>
</tr>
<tr>
<td>Burning sensation of eyes</td>
<td>103</td>
<td>63.2</td>
</tr>
<tr>
<td>Shortness of breath and cough</td>
<td>117</td>
<td>71.8</td>
</tr>
<tr>
<td>Loss of consciousness</td>
<td>20</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Table 2: Delayed skin manifestations of Peshmargas exposed to chemical attack

<table>
<thead>
<tr>
<th>Skin manifestations</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity to mild injury</td>
<td>8</td>
<td>4.9</td>
</tr>
<tr>
<td>Hyperpigmentation</td>
<td>7</td>
<td>4.3</td>
</tr>
<tr>
<td>Hypopigmentation</td>
<td>3</td>
<td>1.8</td>
</tr>
<tr>
<td>Scaring</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Itching</td>
<td>52</td>
<td>31.9</td>
</tr>
<tr>
<td>Burning sensation of the skin</td>
<td>14</td>
<td>8.6</td>
</tr>
<tr>
<td>Xerosis</td>
<td>9</td>
<td>5.5</td>
</tr>
<tr>
<td>Localized hair loss</td>
<td>17</td>
<td>10.4</td>
</tr>
<tr>
<td>Chronic urticaria</td>
<td>3</td>
<td>1.8</td>
</tr>
<tr>
<td>Psoriasis</td>
<td>1</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Table 3: Delayed nervous system manifestations of Peshmargas exposed to chemical attacks

<table>
<thead>
<tr>
<th>Nervous system manifestations</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>72</td>
<td>44.2</td>
</tr>
<tr>
<td>Nausea</td>
<td>28</td>
<td>17.2</td>
</tr>
<tr>
<td>Muscle weakness</td>
<td>6</td>
<td>3.7</td>
</tr>
<tr>
<td>Fatigue</td>
<td>73</td>
<td>44.8</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Tremor</td>
<td>44</td>
<td>27.0</td>
</tr>
<tr>
<td>Parasthesia</td>
<td>40</td>
<td>24.5</td>
</tr>
<tr>
<td>Hypersthesia</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Hyposthesia</td>
<td>6</td>
<td>3.7</td>
</tr>
<tr>
<td>Vertigo</td>
<td>47</td>
<td>28.8</td>
</tr>
</tbody>
</table>

The most common delayed ophthalmologic manifestations were eye itching (39.3%), eye redness (34.4%) and eye tearing (29.4%) as illustrated in Table 4. There were some delayed miscellaneous manifestations; rhinitis (7.4%), hearing defects (2.5%) and suicide (0.6%)
Table 4: Delayed ophthalmologic manifestations of Peshmargas exposed to chemical weapons

<table>
<thead>
<tr>
<th>Eye manifestations</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye itching</td>
<td>64</td>
<td>39.3</td>
</tr>
<tr>
<td>Eye redness</td>
<td>56</td>
<td>34.4</td>
</tr>
<tr>
<td>Photophobia</td>
<td>27</td>
<td>16.6</td>
</tr>
<tr>
<td>Eye tearing</td>
<td>48</td>
<td>29.4</td>
</tr>
<tr>
<td>Premature presbyopia</td>
<td>2</td>
<td>1.2</td>
</tr>
<tr>
<td>Eye pain</td>
<td>17</td>
<td>10.4</td>
</tr>
<tr>
<td>Foreign body sensation in eye</td>
<td>7</td>
<td>4.3</td>
</tr>
<tr>
<td>Chronic conjunctivitis</td>
<td>22</td>
<td>13.5</td>
</tr>
<tr>
<td>Pterygium</td>
<td>7</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Discussion

Although through our analyzing of the characteristics of the chemical weapon, we suggest that the agent was most probably mustard and chlorine gases, we were unable to identify exactly which of the chemical agents were used to injure our study's victims because of the lack of such information at official military institutions.

The mean age of the victims in our study 34.9±9.6 years was less than the mean age of S. Hejazi et al. 45.84±8.64 years\(^{12}\) and Emadodin Darchini- Marapheh et al. 50.6±9.1 years\(^{13}\) possibly due to longer post attack period in the latter two studies.

The most common clinical manifestations right after the chemical attacks in our study were: nausea, shortness of breath and cough, tearing of eyes and burning sensation of eyes, while, they were dyspnea, wheezing, erythema, blisters, conjunctivitis and photophobia in Freitag L et al\(^{14}\) and Momeni AZ et al\(^{15}\) studies.

The most common skin complaint among those patients was itching, followed by a burning sensation. This is consistent with Balali-Mood et al.,\(^{16}\) and with Layegh and colleagues study\(^{17}\), but the most common skin symptoms in our study (localized hair loss, xerosis and hyperpigmentation were not consistent with Balali-Mood et al. study which showed hyper- and hypopigmentation and skin scarring as the most common findings.\(^{16}\) In none of our patients, we revealed skin cancer as it has rarely been reported up to now and no causal connection has been firmly established and this is consistent with studies by Emadi SN et al\(^{18}\) and Firooz A et al.\(^{19}\)

In this study, the most common subjective neurological findings were fatigue, headache and paresthesia, the findings are consistent with Zargar M et al. study.\(^{20}\) Fatigue was the most observed symptoms in Emadodin Darchini-Maragheh study.\(^{13}\) Engel et al. described fatigue as one part of “post-war syndrome” beside depression and chronic pain.\(^{21}\)

The most common neurological complications in our study were headache, vertigo, tremor and paresthesia, which were consistent with findings of Namazi S et al. study, who also reported epilepsy as a common neurological complication (16.42%),\(^{22}\) while it was rare in our study (0.6%).

We found the most common eye complications as itching, redness, tearing and photophobia. This is similar to findings in a study by Namazi et al\(^{22}\) and a study by Ghasemi et al.\(^{23}\) A significant proportion of patients had chronic conjunctivitis in our study, a finding close to Balali-Mood and colleagues finding.\(^{16}\)

Conclusion

ISIS used in the battle chemical agents different times against Kurdistan Region Peshmarga forces. The type of agent is yet to be identified. Fatigue (44.8%), Headache (44.2%), Eye
itching (39.3%), Eye redness (34.4%) and Skin itching (31.9) were the most common Multiple delayed complications identified. Further studies are required to evaluate other systems delayed complications. As well as to evaluate the victims for more delayed complications which usually develop over time.

References
5. Linda AM. Handbook of Toxicology of Chemical Warfare Agents (Second Edition), Chapter 6 - Epidemiology of Chemical Warfare Agents. 2015: 47-56
Cytogenetic study among chemical bombardment survivors in Shekh Wasan and Balisan valley Kurdistan Region-Iraq

Sheeman Hameed Mohammed, College of Nursing, Hawler Medical University Hazha Jamal Hedayat, College of Education, Salahaddin University
Email address: sheeman.hameed@nur.hmu.edu.krd

Abstract
This study was performed randomly on 40 individuals selected within a specific period, between January 2014 to October 2014 in order to a certain whether or not a sample of chemical weapons used on Shekh Wasan and Balisan valley on 16 April 1987, have incurred genetic damage. The study showed that the chromosomal aberration is a very sensitive and widely applied assay used as a bioindicator of genetic damage induced by an environmental agent or clastogen. In the current study a group of 40 chemical bombardment survivors there were 15 individuals have different types of chromosome aberrations, including (ring chromosome 52.5%, dicentric chromosome 30%, chromosome break with fragment 57.5%, chromatid interchange (quadriradial) 27.5%, chromatid interchange (triradial) 27.5%.

Keywords: Chromosomal Abberation; Chemical Weapons; Clastogen.

Introduction
For centuries extremely toxic chemicals have been used in wars, conflicts, terrorists, extremists and dictators activities, malicious poisonings and executions. One of the earliest forms of chemical warfare agents (CWAs) were natural toxins from plants and animals which were used to coat arrowheads commonly refer to as "arrow poisons".\(^1\)

The population of towns in Kurdistan region-Iraq, especially the Shekh Wasan & Balisan valley where the civilian populations exposed to chemical weapons more than once. The Shekh Wasan & Balisan valley poison gas attack was a genocidal massacre against the Kurdish people that took place on April 16, 1987. The Kurdish inhabitants of Shekh Wasan & Balisan valley were aerially bombarded with a cocktail of chemical weapons, including mustard gas, nerve agents sarin, tabun, and hydrogen cyanide.\(^2\)

Sulphur mustard is genotoxic because of its reactions with DNA, which is an important first step in carcinogenesis.\(^3\) Human exposure to nitrogen mustard resulted in chromosomal breakage.\(^4\)

Changes in the genes and chromosomes do not usually produce an immediate health hazard. They may go undetected for a lifetime or even for several generations, Yet, the human gene pool can become insidiously polluted.\(^5\)

The toxicant that enters into human body cause disturbance to the normal state and behavior of the chromosomes which in turn lead to reshuffling of hereditary material causing chromosomal aberration and gene mutation in somatic and germ cells.\(^6\)

The frequency of chromosomal aberrations produced by mustard gas can be expected to depend on the initial extent of alkylation, removal and repair of lesions prior to replication, and the extent and accuracy of post replication repair. The persistent lesions are largely responsible for the clastogenic effects of mustard gas. It has long been accepted that cross-linking of DNA by bifunctional mustards is largely responsible for the production of chromosomal aberrations since a much higher extent of monofunctional DNA alkylation is required to produce chromosomal damage.\(^7\)

This study aimed to assess the effect of the chemical weapons used on Shekh Wasan and Balisan valley on 16 April 1987 on incurring genetic damage.
Materials and methods
Collection of samples
Blood sampling
Two ml of blood were collected from each patient having health problems, using sterile disposable syringes. Then, the blood was put in a special tube for chromosomal study (Lithium Heparin Tube).

Blood culture
Lymphocytes were separated from Whole blood cultures were initiated by the addition of 5 mL RPMI-1640 medium with hepes and L-glutamine containing 10% fetal bovine serum (Sigma-Aldrich, United Kingdom), penicillin (100 U/mL) and streptomycin (100 U/mL), and phytohemagglutinin (2%). Duplicate cultures for each case were carried out for seventy-two hours at 37°C. Colcemide (final concentration, 10 mg/mL) was added and was incubated for forty-five minutes before the end of the culture. The cells were harvested and slides were prepared under standard conditions (incubated with 0.075M KCL for twelve minutes and then cells were fixed with methanol: acetic acid 1:3), and the suspension was dropped onto clean slides and stained with Giemsa.

Statistical Analysis
Complete Randomized Design (CRD) used in the analysis the data also means± stander error (M±SE) were computed. The statistical analysis was carried out manually.

Results and Discussion
This study included the targeted group of 40 individuals from Shekh Wasan and Balisan valley, all of them are exposed to chemical weapons and 10 individuals non-exposes to chemical weapons. In this study, the exposed individuals were selected in order to determine the effects of chemical weapons used on Shekh Wasan & Balisan valley on 16 April 1987. Out of 40 chemical bombardment survivors, there were 15 individuals have different types of chromosome aberrations, including (ring chromosome 52.5%, dicentric chromosome 30%, chromosome break with fragment 57.5%, chromatid interchange (quadriradial) 27.5%, chromatid interchange (triradial) 27.5%.

The result of the present study represents different types of chromosomal aberrations in peripheral blood lymphocyte of patients, including both sexes. The values of Table 1 shows analysis of variance for the effect of sex on the chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley. Statistically, there is a non-significant difference (p<0.05) for sex factors, mean that males and females are equally affected.

Table 1: Analysis of Variance for the effect of sex on the chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley (Mean square).

<table>
<thead>
<tr>
<th>Source of variance</th>
<th>d.f</th>
<th>Chromosome aberrations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean square</td>
</tr>
<tr>
<td>Between treatments</td>
<td>1</td>
<td>6.4*</td>
</tr>
<tr>
<td>Within treatments</td>
<td>8</td>
<td>9.95</td>
</tr>
<tr>
<td>(Error)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

*(p<0.005)
Similar result was obtained by Sulaiman, (2013)\textsuperscript{10} in the study on Halabja city population, 215 patients having different health problems, 215 among them having different types of aberrations (dicentric chromosome, chromatid interchange (triradial), Ring chromosome, fragment, centromeric break, hyperdiploidy, chromatid interchange (quadriradial) and hypertriploidy, also 45 patients having different types of cancer (20 patients Lung cancer, 10 patients Leukaemia, 9 patients Breast cancer and 6 patients Colon cancer). Our results were also supported by Scott & Fox (1974)\textsuperscript{11} suggested that human exposure to nitrogen mustard resulted in chromosomal breakage. They also concluded that following the seven years of treatments with nitrogen mustard, a significant aberration rate (especially chromosome 5 and 7) and chromosome breakage (especially chromosome 5, 7 and 9) developed.

![Figure 1: The percentage of all chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley.](image)

Table 2 shows mean ± S.E for the effect of sex on the chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley, the highest value was ring chromosome (1.42±0.368) and the lowest value was dicentric chromosome (0.714±0.285) in females, while in males the highest value was fragment (1.75±0.25) and the lowest value was chromatid interchange (Quadriradial) (0.5±0.188). Similar result was obtained by Sulaiman, (2013) in the study on Halabja city population, the highest value of chromosome aberrations was ring chromosome (1.395±0.434) in females, while in males the highest value was (chromatid interchange: triradial) (9.333±0.333), this similarity is due to that the same gas used in Halabja city and Shekh Wasan & Balisan valley (Dizaye, 2012).

<table>
<thead>
<tr>
<th>Sex</th>
<th>Ring</th>
<th>Dicentric</th>
<th>Fragment</th>
<th>Quadriradial</th>
<th>Triradial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>1.428±0.368</td>
<td>0.714±0.285</td>
<td>1.285±0.285</td>
<td>0.857±0.142</td>
<td>0.857±0.404</td>
</tr>
<tr>
<td>Male</td>
<td>1.375±0.283</td>
<td>0.875±0.294</td>
<td>1.75±0.25</td>
<td>0.5±0.188</td>
<td>0.75±0.25</td>
</tr>
</tbody>
</table>
Table 3 shows the analysis of variance for the effect of age (3 groups) on the chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley, statistically there was non-significant difference (p<0.05) for 3 age groups factors, means that the first age group (27-36), second age group (37-49) and third age group (50-59) are equally affected.

**Table 3:** Analysis of Variance for the effect of age (3 groups) on the chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley (Mean square).

<table>
<thead>
<tr>
<th>Source of variance</th>
<th>d.f</th>
<th>Chromosome aberrations mean square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between treatments</td>
<td>2</td>
<td>8.6*</td>
</tr>
<tr>
<td>Within treatments (Error)</td>
<td>12</td>
<td>6.86</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

*(p<0.05)*

Mutation can be caused by two distinct mechanisms: (a) misreplication resulting from insertion of an incorrect base opposite an alkylated purine with altered base-pairing properties. Replication errors will give rise to point mutation; and (b) misrepair resulting from the operations of the error-prone system, in addition to point mutation, repair errors can give rise to deletions, abnormal recombination, and structural damage to chromosome. Sulphur mustard is genotoxic because of its reactions with DNA, which is an important first step in carcinogenesis. Human exposure to nitrogen mustard resulted in chromosomal breakage. Changes in the genes and chromosomes do not usually produce an immediate health hazard. They may go undetected for a lifetime or even for several generations. Yet, the human gene pool can become insidiously polluted. Significant enhancement in the frequency of sister chromatid exchanges has been reported in peripheral lymphocytes obtained from fishermen who exposed to SM by leakage of the agent from World War II shells recovered from the Baltic sea. Other cytogenetically detected chromosomal changes that have been reported to be caused by mustard exposure (mostly in studies performed with HN₂) include gaps, deletions, exchanges, chromosomal stickiness, segregation errors, variable chromosome numbers, micronuclei, and chromosome "shattering". The frequency of chromosomal aberrations produced by mustards can be expected to depend on initial extents of alkylation, removal and repair of lesions prior to replication, and the extent and accuracy of post replication repair. The persistent lesions are largely responsible for the clastogenic effects of mustards. It has long been accepted that cross-linking of DNA by bifunctional mustards is largely responsible for the production of chromosomal aberrations since a higher extent of monofunctional DNA alkylation is required to produce chromosomal damage.
The mutagenic and chromosome damaging effects of SM are of interest. SM was one of the first chemical compounds to demonstrate mutagenic activity in Drosophila and subsequently, in various species.11

Chronic exposure of mice to vaporized SM (0.1 mg/m³) over a 52-week period produced a cumulative increase in dominant lethal mutations. Such mutations are thought not to be point mutation; rather, they are thought to result from chromosome breakage.15

**Table 4:** Mean ± S.E for the effect of age (3-groups) on the chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley.

<table>
<thead>
<tr>
<th>Age</th>
<th>Ring</th>
<th>Dicentric</th>
<th>Fragment</th>
<th>Quadiradial</th>
<th>Triradial</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-36</td>
<td>1.50 ± 0.499</td>
<td>0.666 ± 0.210</td>
<td>1.333 ± 0.333</td>
<td>0.666 ± 0.210</td>
<td>1.166 ± 0.307</td>
</tr>
<tr>
<td>37-49</td>
<td>1.25 ± 0.25</td>
<td>0.78 ± 0.478</td>
<td>1.75 ± 0.478</td>
<td>0.75 ± 0.25</td>
<td>0</td>
</tr>
<tr>
<td>50-59</td>
<td>1.4 ± 0.244</td>
<td>1.000 ± 0.447</td>
<td>1.600 ± 0.244</td>
<td>0.600 ± 0.244</td>
<td>1.000 ± 0.447</td>
</tr>
</tbody>
</table>

Table 4 shows mean ± S.E for the effect of age (3-groups) on the chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley, the highest value for first group age (27-36) was ring chromosome (1.50 ± 0.499) and lowest value for the age group was quadiradial (0.666 ± 0.210), while the highest value for the second age group (37-49) was fragment (1.75 ± 0.478) and lowest value for the same group was quadiradial (0.75 ± 0.25), and the highest value for the third group age (50-59) was fragment (1.600 ± 0.244) and the lowest value for the same group was quadiradial (0.600 ± 0.244).

In this study we can notice that the highest rate of chromosomal aberrations is for the last age group between (50-59). Also similar result was obtained by Sulaiman, (2013)10 in study on Halabja city we also getting the highest rate of chromosomal aberrations in same age group (50-58), this is may be due to that the people become older in age their DNA repair system and also immune system cannot be able to repair all the accumulated mutations in chromosome so high number of aberrations was found in older age group.

In the 2013 and 2014, the Ministry of Martyrs and Anfal in the Kurdistan Region-Iraq established the Commission of all medical specialties and were examined (937) people on four groups that exposed to chemical weapons in Khoshnawaty areas including (Shekh Wasan & Balisan valley) and proved that (626) actually still suffering from the effects of chemical weapons after more than 28 years later.
Figure 2: Shows structural chromosomal aberrations among chemical bombardment survivors in Shekh Wasan & Balisan valley (100X, Giemsa stain).

Reference
Clinical Biochemical and Hematological Follow up of Peshmergas Exposed to Chemical Weapon

Yasin Kareem Amin¹, Mohammed Youns Qader², Ahmad Mustafa Mekaail³, Goran Qader Othman⁴

¹ Hawler Medical University, Medical Research center
² Kurdistan Board for Medical Specialties
³ Erbil Polytechnic University, Health Technical College
⁴ Ministry of Health
Email address: dr.yasin@hmu.edu.krd

Abstract
The chemical weapons used by ISIS against peshmerga force was the headline of news many weeks. The objective of this study is to follow up with the new clinical feature, hematological and some biochemical values of exposed individuals. The total number of all military units involved in this study are 98 participants, Participants divided into exposed groups (56 individuals) and non-exposed group (42 individuals). Clinical and laboratory assessments and follow up were done in the same hospital. Starting from the time of exposure (zero time), one month later, two months late, six months later, then one year later, for both groups. The results showed that there is no significant evidence for the relationship between Peshmergas chemical exposure and liver transaminases, serum cholesterol, serum triglyceride, renal function test, and hematological follow up measurement

Keywords: Chemical weapon; Peshmerga; Lab; Assessments; Clinical feature.

Introduction
Sulfur mustard first used on the battlefield in Belgium during World War I. In modern times, it remains a threat on the battlefield as well as a potential chemical terrorism weapon because of the simplicity of its manufacture and its extreme effectiveness.¹ Sulfur mustard accounted for 70% of the 1.3 million chemical casualties in World War I. Occasional cases of sulfur mustard intoxication continue to occur in the United States among people exposed to World War I- and World War II-era munitions.² mustard agents accounted for 80% of chemical victim problems in World War I. Mustard injuries were slow to heal and made delay in healing for a period of 6 weeks.³ Italy allegedly used mustard against Abyssinia in the 1930s. Japan allegedly used mustard agents against the Chinese from 1937-1944. Nitrogen mustard agents were synthesized in the late 1930s. Mechlorethamine (HN-2) became the prototypical mustard agent used as a cancer chemotherapeutic agent.⁴ During the Iran-Iraq war from 1979-1988, approximately 5000 Iranian soldiers were reported killed by Iraqi chemical agents, 10-20% by mustard agents. With extra 40,000-50,000 individuals were injured resulting in many chronic medical problems.⁵ After the February 1991 cease-fire ending the Persian Gulf War, United Nations inspection teams discovered mustard agents at Al Muthanna, Iraq. Besides the threat of chemical attack, a larger concern may be the tons of mustard agents that were produced for war and then dumped at sea, buried in landfills, or left to decay in storage facilities.⁶ In Sweden, recurring incidents of mustard agent exposures involve fisherman who encounter discarded chemical weapons that were dumped in the waters off the coast after World War II. Before the 1970s, the United States dumped obsolete chemical weapons at sea; three separate incidents of exposure to sulfur mustard munitions were reported.⁷ No single mechanism or clear understanding exists for the biological damage caused by mustard agents.⁸ Physical signs and symptoms, conjunctivitis sustaining long-term consequences,⁸ delayed keratitis,⁶ Delayed ocular symptoms follow a latent period of 1-40 years, and reduced
symptoms are reported in cold climates. After heavy exposure, eye signs and symptoms appear after 0.5-3 hours, and severe lesions may appear. Blepharospasm is common. A steamy haziness of the cornea or an orange-peel roughening of the cornea may occur. Spotty hemorrhagic discolorations of the iris may be observed. Temporary blindness is common, but permanent blindness is rare. Mild corneal involvement demonstrates corneal erosions with fluorescein staining. Superficial corneal scarring and vascularization or iritis may occur. With severe corneal involvement, dense corneal opacification with deep ulceration and vascularization occurs. Local necrosis of the cornea may rupture the globe. Panophthalmitis may occur and result in eye loss if appropriate therapy is not instituted. Recovery from the ocular effects, especially with corneal involvement, may take months. Delayed ocular manifestations may occur abruptly from 1-40 years after exposure. The severity of cutaneous effects of mustard and the rapidity with which they develop are influenced by the degree of exposure and the weather. Hot, humid weather results in more severe lesions. Warm, moist areas, such as the perineum, external genitalia, axillae, antecubital fossae, and neck, are most susceptible. The latent period from contact with liquid or vapor exposures is usually 6-12 hours but may be as short as 1/2 hour when the weather is hot and humid. The effects appear more rapidly from a liquid agent than from vapor. The initial cutaneous effect is erythema, resembling a sunburn. Slight skin edema may occur with mild exposures, but in severe burns, edema is greater. Vapor exposures may not cause skin lesions. Systemic symptoms such as malaise, vomiting, and fever may develop approximately at the onset of erythema. Intense cutaneous pruritus is common, may last for several days, and may persist after healing. Erythema is followed by vesication as a result of liquefaction necrosis in the epidermal basal cell keratinocytes. The stratum corneum remains intact. Separation of the epidermis from the dermis occurs. A liquid droplet with 10 mcg of mustard produces vesication. Vesicles are more concentrated in warm, moist areas such as the groin and axilla. Vesicles and bullae may be painful and are filled with yellow transudate that tends to coagulate. This fluid does not contain mustard and is not a risk to contacts. Reabsorption of the fluids takes place in approximately one week if the vesicles or bullae do not rupture. If rupture occurs, the burn is considered an open wound and is susceptible to secondary infection. Spontaneous healing occurs slowly with little scar formation. Exposed areas of skin may (20% of patients) develop a persistent brown pigmentation except at the site of actual vesication, where a temporary depigmentation is seen. The rate of healing typically is 1-2 weeks for facial lesions and up to 2-4 weeks or longer for other areas of the skin. Secondary infection may increase the severity of the lesions and delay healing. Skin lesions are more severe in light-skinned, younger, and female patients. Management pre-hospital care providers attending contaminated patients should have protective masks, if the victim already has erythematous skin, decontaminating the skin with just soap and water is recommended, immediately flush the eyes with water or buffered normal saline. No specific treatment or antidote can reverse or prevent the cellular effects of chemical weapons. Symptomatic treatment is used to address affected organ systems, for example: respiratory obstruction, hypoxia unresponsive to supplemental oxygen, or respiratory failure should undergo endotracheal intubation and mechanical ventilation. This study aimed to evaluate the new clinical feature hematological and some biochemical values of exposed individuals

Patient and Methods
Design, sampling size and distributions
The type of study is an observational, analytical prospective cohort study. The total number of all military units involved in this study are 98 participants, Participants divided into exposed groups and non-exposed group. The exposed groups which include Pehsmargas have been exposed to chemical agents of unknown type, by the same enemy, in deferent areas, and the same weapon type according to their description of events. The non-exposed group
includes Pehsmargas in the same military force groups but not exposed to chemical weapons. The sample size of exposed peshmargas are totally 56 patients, in three attacks, while the non-exposed participants are 42 in number. Clinical and laboratory assessment and follow up was done in the same hospital. Starting from the time of exposure (zero time), one month later, two months late, six months later, then one year later, for both groups. Inclusion criteria: All Pehsmargas who have been exposed to a chemical bomb blast in all three attacks. Exclusion criteria: Pehsmargas who are not exposed to chemical bomb at these three dates of attacks.

**Study organization**
The exposed group in three events are totally 56 Pehsmargas initially exposed at date of 12/12/2015, the 2nd is composed of 13 Pehsmargas, also exposed to chemical bomb at 2016, and the third group consisted of 34 Pehsmargas and exposed to a chemical bomb in 15/5/2016, After exposure of Pehsmarga forces in Kurdistan of Iraq to the rocket of ISIS group in front lines, all of Pehsmargas described that they smelt an offensive odor, resembling putrefied onion as they describe, transferred by ambulance to the Erbil west emergency hospital to exchange their clothes, and take a cold water shower, with cleaning of the wounds, giving other lines of treatment accordingly, a thorough history, complains recorded and examination with and documentation of findings, with screening investigations of all exposed Pehsmargas with recording of results of all investigations including hematological, biochemical and liver transaminases, CRP, ECG, and chest-x-ray performed for all of them, then repeated in follow up in next months, 2 months later, 6 months later, one year later.

**Statistical analysis**
Prospective epidemiologic studies of both group of Pehsmargas undertaken, for assessment relative risk assessment of new clinical features and new lab test abnormality in the exposed group which carry the possibility of expose related disease development

**Results**
Patient characteristics revision (Table 1) all exposed and none exposed are male, no female gender involved in this study, making that to ignore gender characteristic.

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Exposure status</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non exposed</td>
<td>Exposed</td>
<td></td>
</tr>
<tr>
<td>Age groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-39</td>
<td>32</td>
<td>22</td>
<td>54</td>
</tr>
<tr>
<td>40-59</td>
<td>23</td>
<td>18</td>
<td>41</td>
</tr>
<tr>
<td>60-80</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Blood pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No HTN*</td>
<td>53</td>
<td>39</td>
<td>92</td>
</tr>
<tr>
<td>HTN</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>7</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Married</td>
<td>49</td>
<td>36</td>
<td>85</td>
</tr>
<tr>
<td>Smoking Status</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Non-smoker</td>
<td>8</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Smoker</td>
<td>48</td>
<td>34</td>
<td>82</td>
</tr>
<tr>
<td>Blood Sugar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Diabetes</td>
<td>54</td>
<td>39</td>
<td>93</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>
*HTN=hypertension

Figure 1: Smoker versus nonsmoker in regard to exposure

Figure 2: Bar chart showing age distribution among exposed versus non-exposed

The mean age of exposed individuals was 38 years and non-exposed were 39, minimum age of 22, and the maximum of 66 years and risk estimation showed no effect of age statistically, also no significant statistical value obtained from HTN, marital status, smoking and DM. Baseline renal function test represented in blood urea and serum creatine and serum uric acid as a marker of excretory function of kidney at time of exposure have been measured then repeated and compared between two groups and re-evaluated at the end of the study (one year later) between both groups showed no statistical significance, and relative risk of nearly the same between exposed and non-exposed groups (Table 2).

Inflammatory markers in the form of ESR and CRP evaluation at the time of exposure and again rechecked after one year of exposure showed no significance of follow up as there is no significant change in the statistical point of view with the relative risk of about one (Table 3). Checking lipid profile simply with total serum cholesterol and fasting serum triglyceride at time of exposure and after one year from exposure showed no statistical difference in both groups in both occasions with a relative risk of exposure to the non-exposure status of nearly one (Table 4).
### Table 2: Creatinine, urea and uric acid versus exposure status crosstabulation

<table>
<thead>
<tr>
<th></th>
<th>Exposure status</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non exposed</td>
<td>Exposed</td>
</tr>
<tr>
<td><strong>Serum creatinine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>2</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4</td>
</tr>
<tr>
<td><strong>Blood urea</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>6</td>
</tr>
<tr>
<td><strong>Serum uric acid</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>9</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>5</td>
</tr>
</tbody>
</table>

### Table 3: ESR and CRP versus exposure status crosstabulation

<table>
<thead>
<tr>
<th></th>
<th>Exposure status</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non exposed</td>
<td>Exposed</td>
</tr>
<tr>
<td><strong>ESR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>9</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>8</td>
</tr>
<tr>
<td><strong>CRP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>10</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>8</td>
</tr>
</tbody>
</table>

### Table 4: Total cholesterol and triglyceride versus exposure status crosstabulation

<table>
<thead>
<tr>
<th></th>
<th>Exposure status</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non exposed</td>
<td>Exposed</td>
</tr>
<tr>
<td><strong>Total serum cholesterol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>8</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>12</td>
</tr>
<tr>
<td><strong>Serum triglyceride</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>16</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>14</td>
</tr>
</tbody>
</table>
Evaluation of tissue enzymes including liver and other tissue, follow up of AST ALT and ALP at time of exposure and one year follow up showed no significant statistical importance after exposure (Table 5)

Table 5: AST, ALT and ALP versus exposure status crosstabulation

<table>
<thead>
<tr>
<th>Exposure status</th>
<th>Non exposed</th>
<th>Exposed</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>46</td>
<td>34</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>45</td>
<td>39</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>ALT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>49</td>
<td>39</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>7</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>49</td>
<td>41</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>ALP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>46</td>
<td>37</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>50</td>
<td>41</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>6</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

Lastly hematological evaluation regarding RBC, WBC and platelets at time of exposure and after one year of follow up showed no significant change and relative risk of exposure to disease outcome is nearly the same for both exposed and non-exposed groups with a P value of 0.34, 0.65, and 0.09 respectively (Table 6).

Table 6: WBC, platelet and RBC versus exposure status crosstabulation

<table>
<thead>
<tr>
<th>Exposure status</th>
<th>Non exposed</th>
<th>Exposed</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>49</td>
<td>37</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>7</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>48</td>
<td>41</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>8</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Platelet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>56</td>
<td>42</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>0</td>
<td>0</td>
<td>98</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>56</td>
<td>42</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RBC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At the time of exposure</td>
<td>Normal</td>
<td>55</td>
<td>42</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>After one year</td>
<td>Normal</td>
<td>56</td>
<td>42</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Abnormal</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

RBC; red blood cell, WBC; white blood cell
Discussion
In the current study after one year of follow up clinically hematologically and biochemically showed different complains in all groups, but no significant change found in hematological and biochemical follow up. Many studies performed on clinical manifestation of chemical weapon victims which indicates clinical importance of study rather than biochemical and hematological reassessment. A study in Iran Islamic republic done under the title of Sardasht-Iran cohort study of chemical warfare victims, showed long-term clinical consequences of sulfur mustard have emerged from some. Sardasht-Iran Cohort Study is a comprehensive historical cohort study on Sardasht chemical victims' population which was designed to find out the long-term complications of sulfur mustard exposure and the basic mechanisms underlying clinical manifestations. In Sardasht-Iran Cohort Study, 500 individuals including 372 subjects from Sardasht, as the exposed group, and 128 subjects from Rabat, as the unexposed age-matched control group was evaluated. However, in our study three groups (11, 13, 34) group A, B, C consequently, totally 58 exposed Pehsmargas have been evaluated in direction of time axis. In Sardasht-Iran Cohort Study, The exposed group was divided into two groups based on the severity of clinical complications at the time of exposure. Different samples including blood, sputum, saliva, tear, urine, and semen were collected for immunologic, hematologic, biochemical, and other laboratory analysis. However, in our study blood, three groups in the different area are evaluated in deferent times. However, sputum, saliva, tear, urine, and semen were collected for, hematologic and biochemical but semen not evaluated in this study. In both studies (our study and in Sardasht-Iran cohort study), data were gathered from medical records, clinical examinations, laboratory tests. The Sardasht-Iran cohort study provides important information on various aspects of long-term consequences of sulfur mustard exposure.

Conclusion
A meta-analysis of prospective epidemiologic studies showed that there is no significant evidence for the relationship between Pehsmargas chemical exposure and liver transaminases, serum cholesterol, serum triglyceride, renal function test, and hematological follow up measurement, more data are needed to elucidate whether clinical, hematological, biochemical and liver transaminases are likely to be influenced by the effect of exposure to chemical weapon. A study for long term follow up needed to give a better correlation between the exposure to chemical bombs and clinic-biological follow up of these victims. The system must have well trained staffs and doctors to be able to know how to deal with exposed and decontaminate all exposed persons in an academic way, A well-organized system to protect the non-exposed peoples and educate peoples to learn how to deal with chemical weapon events

References
1. Croddy E. Chemical and Biological Weapons. In: Croddy E, Wirtz J. Weapons of Mass Destruction; California: Abc-Clio Inc. 2005 available from:
Mortality and kidnapping estimates for the Yazidi population in the area of Mount Sinjar, Iraq, in August 2014: A retrospective household survey

Valeria Cetorelli¹, Isaac Sasson¹, Nazar Shabila², Gilbert Burnham³

¹London School of Economics and Political Science, London, United Kingdom
²Hawler Medical University, Erbil, Kurdistan Region, Iraq
³Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA
Email address: nazar.shabila@hmu.edu.krd
Fulltext available at: https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002297

Abstract

Background
In August 2014, the so-called Islamic State of Iraq and Syria (ISIS) attacked the Yazidi religious minority living in the area of Mount Sinjar in Nineveh governorate, Iraq. We conducted a retrospective household survey to estimate the number and demographic profile of Yazidis killed and kidnapped.

Methods
The survey covered the displaced Yazidi population from Sinjar residing in camps in the Kurdistan Region of Iraq. Fieldwork took place between 4 November and 25 December, 2015. A systematic random sample of 1,300 in-camp households were interviewed about the current household composition and any killings and kidnappings of household members by ISIS. Of the 1,300 interviewed households, 988 were Yazidi from Sinjar. Yazidi households contained 6,572 living residents at the time of the survey; 43 killings and 83 kidnappings of household members were reported. We calculated the probability of being killed and kidnapped by dividing the number of reported killings and kidnappings by the number of sampled Yazidis at risk, adjusting for sampling design. To obtain the overall toll of killings and kidnappings, those probabilities were multiplied by the total Yazidi population living in Sinjar at the time of the ISIS attack, estimated at roughly 400,000 by the United Nations and Kurdish officials. The demographic profile of those killed and kidnapped was examined, distinguishing between children and adults and females and males.

Results
We estimated that 2.5% of the Yazidi population was either killed or kidnapped over the course of a few days in August 2014, amounting to 9,900 (95% CI 7,000–13,900) people in total. An estimated 3,100 (95% CI 2,100–4,400) Yazidis were killed, with nearly half of them executed—either shot, beheaded, or burned alive—while the rest died on Mount Sinjar from starvation, dehydration, or injuries during the ISIS siege. The estimated number kidnapped is 6,800 (95% CI 4,200–10,800). Escapees recounted the abuses they had suffered, including forced religious conversion, torture, and sex slavery. Over one-third of those reported kidnapped were still missing at the time of the survey. All Yazidis were targeted regardless of age and sex, but children were disproportionately affected. They were as likely as adults to be executed but constituted 93.0% (95% CI 71.9–98.6) of those who died on Mount Sinjar. Moreover, children only accounted for 18.8% (95% CI 8.4–36.9) of those who managed to escape captivity. A sensitivity analysis suggests that the actual toll of killings and kidnappings may be underestimated in our data because of survival bias. The uncertainty associated with inference from a small sample of in-camp households and the reliance on a rough figure of 400,000 for extrapolation to the total Yazidi population of Sinjar at the time of the ISIS attack are the main limitations of this study.

Conclusions
Consistent with other existing evidence, our data provide a clear indication of the severity of the ISIS attack against the Yazidis in terms of both the number and demographic profile of those targeted.