

Retrospective Analysis of Surgical Emergencies During the Arbaeena Mass Gathering at a Tertiary Medical City in Karbala, Iraq

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Abstract: ***Background:** Mass gatherings, such as the annual Arbaeena pilgrimage in Karbala, Iraq, present significant challenges to healthcare systems due to overcrowding, trauma risks, and the convergence of infectious and chronic diseases. This study aims to describe the prevalence and outcomes of surgical emergencies among pilgrims visiting the emergency department of Al Imam Al Hussein Medical City. **Methods:** A retrospective survey was conducted from October 18 to November 22, 2018 (coinciding with 9 Safar 1440). Data were collected from the emergency ward registration for all patients admitted during this period. **Results:** A total of 41,051 patients were admitted to the emergency unit. Key findings include: **Case Classification:** 74% (30,390) were medical cases, while 26% (10,661) were surgical cases. **Demographics:** The most affected age group was 21–30 years (26%). The male-to-female ratio was 1.9:1. **Nationality:** The vast majority of patients were Iraqi (96.6%). **Surgical Outcomes:** Of the 10,661 surgical cases, 85% were admitted to the ward, 2.8% were discharged well, and 12.3% (1,308) died. **Etiology:** Surgical emergencies were primarily related to trauma, ranging from fractures to simple cut wounds, and road traffic accidents (RTA). **Conclusion:** The Arbaeena pilgrimage places an immense burden on Karbala's health institutions. The study reported a significant increase in surgical emergencies, leading to high morbidity and mortality. To improve outcomes, the implementation of ATLS protocols, enhanced prehospital services, and organized collaboration between health and religious organizations are vital.*

Keywords: Arbaeena, Mass gathering, Surgical emergencies, Trauma epidemiology, Emergency medicine.

1. Introduction

A mass gathering is a planned or spontaneous event where the number of people attending could strain the planning and response resources of the community or country hosting the event. The Olympic Games, The Hajj, and other major sporting, religious, and cultural events are all examples of a mass gathering.

In Iraq, several religious mass gatherings are held throughout the year, mainly in Karbala, Najaf and Baghdad.¹ The Arbaeena pilgrimage (to Karbala), attracting over 20 million participants annually, presents a unique case study due to its prolonged duration (weeks), cross-border mobility, and heterogeneous demographics- factors inadequately addressed in existing literature. This mass congregation generates complex epidemiological dynamics where infectious disease transmission, environmental hazards, trauma risks, and chronic disease management converge in a temporally condensed timeframe.²

Karbala is located in the southwest part of Iraq, with a population of approximately 1.5 million and an area of approximately 40,000 km². Besides Arbaeena, Sha'abane and Ashuraa pilgrims take place in Karbala, but most of the scientific literature surrounding mass gatherings in Karbala is focused on Arbaeena.³

Mass gathering challenges and burdens may vary depending on the attendee's age, environmental emergencies, type of event, and place where the event takes place (i.e., outdoor vs indoor). Pilgrims to Karbala combine outdoor (while walking

to Imam Hussein Shrine) and indoor (inside the Holy Shrine) activities. Mass gathering events raise concerns regarding infectious disease outbreaks, especially in food sanitation, and visitors coming from neighboring countries could be vectors for potential disease outbreaks. Overcrowding, environmental emergencies, terrorist attacks, water shortage, and proper sanitation are other challenges that may strain local health facilities in Karbala.³

High risks for developing surgical emergencies in mass gatherings mainly include

- Stampedes
- Accidents, trauma, and crush injuries
- Terrorist incidents (biological and chemical warfare threats, explosives, and bombs).⁴

Patients and methods

A retrospective survey method was used to collect data relating to illness occurring at the Arbaeena period which conducted from 18-October to 22 November 2018 (coinciding with 9 Safar 1440) to describe the health care services provided by the local community to participants in the Arbaeena mass gathering in Karbala, The data collected from registration of emergency ward in hospital Imam Hussain medical city. Total number of patients who admitted to emergency unit is 41051patients.

2. Results

41051 patients visited the emergency department in Karbala during the Arbaeena, 30390 patients were medical cases

(74%) and the rest where surgical cases and the decision was made by the triage.

Table 1: Classification of the studied population according to medical services

Classification of cases	No.	Percent (%)
Medicine	30390	74
General surgery	10661	26
Total	41051	100

The age of the visitors is illustrated in the figure below.

Table 2: Age distribution of the studied population during Arbaeena

Age (years)	No.	Percent (%)
1-5	711	1.7
6-10	1094	2.7
11-20	5590	13.6
21-30	10665	26
31-40	9167	22.3
41-50	5291	12.9
51-60	5003	12.2
61-70	2110	5.1
>70	1420	3.5
Total	41051	100

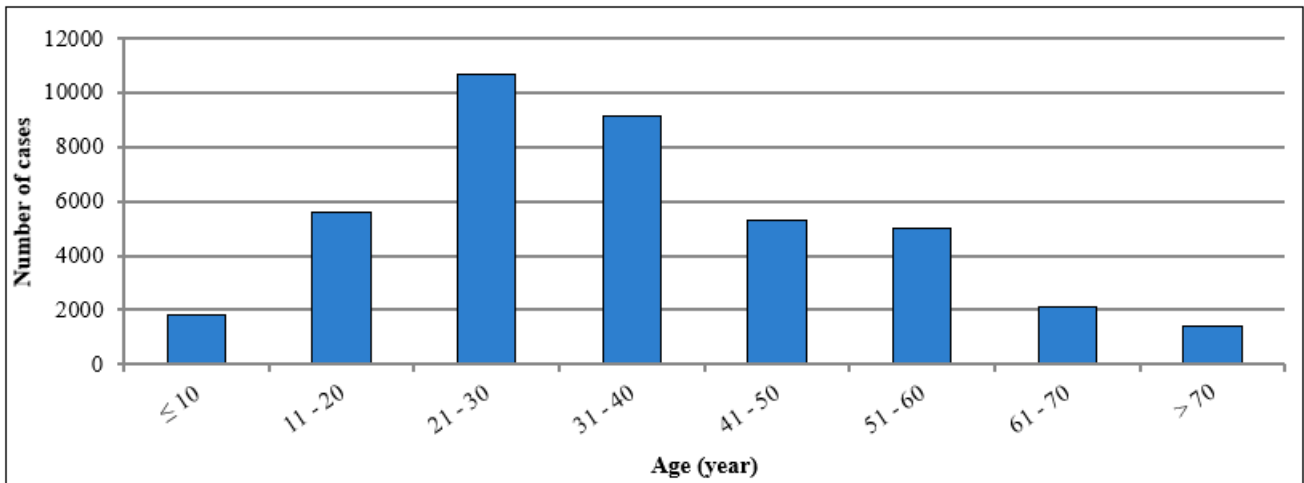


Figure 1: Age distribution of the studied population during Arbaeena

Sex distribution shows male patients more than females in ratio of 1.9:1.0 (figure 1).

The nationalities recorded are shown in table 3.

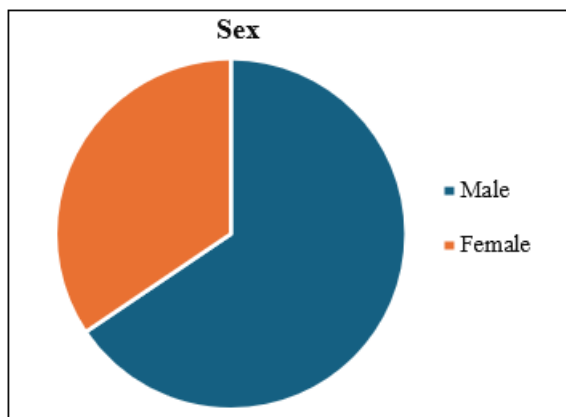


Figure 2: Sex distribution among the population study.

Table 3: The nationalities of the patients

Nationality	No.	Percent (%)
Iraqi	39672	96.6
Arabian	288	0.7
Iranian	551	1.3
Others	540	1.3
Total	41051	100

The surgical emergencies were related to traumas mostly ranged from fractures to simple cut wounds, figure 3 shows the percents of the emergencies.

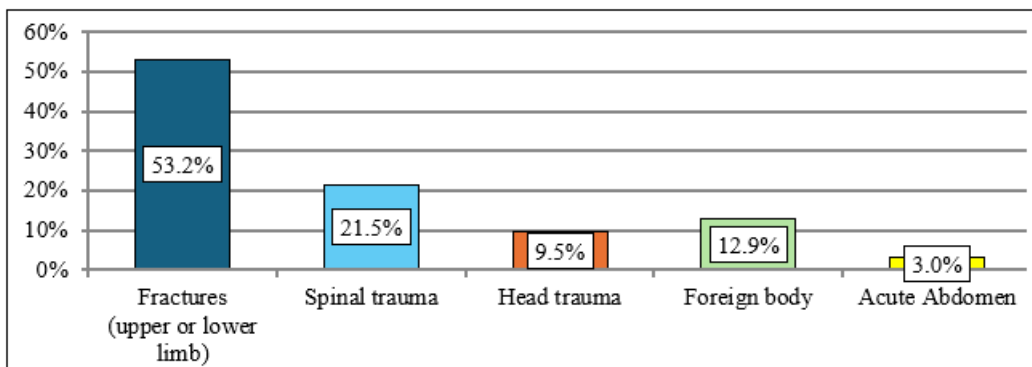


Figure 3: Surgical emergencies in population study.

Table 4: Outcome of the emergency department among the visitors

Outcome	No.	Percent (%)
Discharged well	294	2.8
Admitted to the ward	9059	85
Died	1308	12.3
Total	10661	100

3. Discussion

The gathering in Arbaenea placed a heavy and additional burden on health institutions in Karbala Governorate, despite the tremendous work done by health institutions and religious organizations to serve pilgrims during mass gatherings in Karbala, the emergency of Imam Hussein Medical City bears the greatest burden.

The Abbasid Holy Shrine announced that the number of visitors to Arbaenea reached more than 14 million and 500 thousand visitors, according to the electronic counting system for the period from 9 to 20 of Safar month, by comparison, the hajj, a pilgrimage to Saudi Arabia's Mecca that all able-bodied Muslims are required to make once in their lifetime, saw only 2.5-3 million pilgrims every year.⁵

The total number of patients seeking medical care and filing various health complaints is 41,051 for emergency unit of Imam Hussein medical city, noting that there are many medical stations that provide medical services that received patients, in addition to medical documentation in the emergency unit is relatively inaccurate, meaning that not all emergency admissions are recorded. The age of the affected group ranges from 1 year to more than 70 years, and the subgroup most affected ranges from 21 to 30 years and this may be related to their activity and those more influenced by a road traffic accident.

The percentage of men is more than women (Male to female ratio 1.9: 1) due to the fact that there are more visitors are men, as well as easy arrived at the hospital, This result is similar to the number of pilgrims during the Hajj as in the study of Alnabulsi and his team.⁶

The male and female ratio was 1.2:1. A larger number of males were observed during the event phase, this result corresponding⁷, whereas a similar ratio of both sexes was observed in the pre-event phase.⁸

Most of the visitors are Iraqi in nationality (from Karbala and other governments) 96.6%, while other nationality represented 3.3%, explanation to this percentage, there are medical centers to other nationality whether Iranian or Arabic nationality or they are going to the private hospital. The distribution of the studied population according to their Jobs during Arbaenea whether servants or visitors who need medical services, the percentage of servants who received medical care, 3.5%, mainly this is related they are not thinking themselves or they are not moving like the visitors.

From past medical history, 27.2% of patients had high blood pressure, 21.9% had high blood pressure and diabetes, while only 16.7% had diabetes, and this is associated with poor

adherence to diet and medication that may adversely affect high blood pressure or diabetes.

Classification of the studied population according to medical services whether medical or surgical services, medical cases reported 30390 (74.0 %), while surgical cases 10661(26.0%), recent study agree with Sokhna and his team that mass gathers have been associated with high rates of morbidity and mortality from non-communicable diseases (NCDs) such as (cardiovascular diseases, diabetes mellitus, and asthma), accidents, and terrorist attacks.⁹

Also, in cases which admitted as surgical states only top emergencies are admitted. AL lami and his team proved that the load of the NCD emergencies during the MG event increased 4-fold, and the daily average cases also doubled compared with the pre-event.¹⁰

The majority of presentation of patients with abdominal pain have significant disease necessitating hospital admission. abdominal pain is considered as the presentation for medical and surgical cause, also may be related to nature of diet or infectious diseases, Abdominal pain is a common emergency department symptom and clinicians must consider multiple diagnoses, especially those that require immediate intervention to limit morbidity and mortality.⁹

Headache links to changes in living conditions; environment and lifestyle; stress; fatigue; mental and physical in compliance with these conditions cause or aggravate to headache, also other medical illness cause headache.

About radiological aspect ultrasound, chest X-ray and CT scan also performed to diagnose the cases of patients and take a decision in the management of them. X-ray occupied higher percentage not for diagnosis at the time of admission, also as follow-up X-ray images that performed to evaluate the treatment outcome.

The peak of admission to the emergency department is between 25-28 October, this period corresponding to the beginning of the visit and from 10 to 17 November, and this period represents the end of the visit, and this result is due to the road is open and arrived to the hospital is easy while decreasing because The road is difficult to reach to the hospital.

Hospital admission during Arbaenea: Less than 24 hour (40424) 98.5%, one to Two days 439 (1.1%), Three days or more 188 (0.5%), This short hospitalization was mainly undertaken to stabilize patients who were then discharged from the hospital as soon as possible so that they would be able to complete Arbaenea and go back to Their residences and, to free hospital beds to accommodate the big influx of patients requiring hospitalization in the Arbaenea period.

Stay of the hospital is related to old age and co-morbid conditions, also complications, and, outcomes of cases.

Most of patients discharge well who represented 85.9% (35274), this may be related to most of them who admitted to emergency unit medical cases and can resolved after simple treatment, while those admitted to ward of hospital and

recovery represented (47070) 11.5% , those patients need care in hospital for long period due to operation or any interference, died patients are (1070) 2.6%, this group reached to the hospital so tired, or referred from other center.

Study started on December 11, 2014, and ended on December 24, 2014 by Hantoosh and his friends proved an average number of daily deaths in the pre-event phase was 43; 36 deaths were reported during the event, and 45 deaths were reported in the post-event phase.¹⁰

Trauma Human stampedes at Arbaenea are frequent especially with high population density doing the same things at the same time at the same location in a small crowded area. Accidents such as crush injuries and cardiovascular events have traditionally been the most common causes of morbidity and mortality resulting from mass gatherings. The variables that contribute significantly to mass gatherings medical care in Arbaenea include weather and environmental factors, event type and duration, crowd mood, attendance, crowd density and age.

4. Conclusion

- Our study reported significant increment in number of patients with surgical emergencies and subsequent complication so this lead to increased mortality and morbidity
- Lifesaving resuscitation, rapid intervention and organized collaboration are necessary to improve response and Recovery
- RTA is regarded as a burden to our nation
- ATLS protocol and prehospital service is vital to decrease morbidity and mortality.

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