Arch Iranian Med 2008; 11 (6): 595 – 597

Original Article

Amputations Due to Landmine and Unexploded Ordnances in Post-war Iran

Ahmadreza Soroush MD*, Farahnaz Falahati MD•**, Mousa Zargar MD*, Mohammadreza Soroush MD*, Shahriar Khateri MD*, Ali Khaji MD*

Background: **In view of lack of comprehensive data on landmine casualties that lead to amputation in Iran, we conducted this study to determine the pattern and demographic features of landmine explosions that result in amputation of the victims.**

Methods: **To define the pattern of landmine- and unexploded ordnances-induced amputations and to understand the most common types of underlying activities at the time of the blast, a retrospective study was conducted among the victims in 5 western provinces of Iran, West Azerbaijan, Kermanshah, Kurdistan, Ilam, and Khuzestan between 1988 and 2003.**

Results: **Of a total of 3713 victims, 1499 had undergone amputations. The mean age of the victims at the time of accident was 23 years; 92% of the victims were male, 48.4% of them were of very poor education and all were civilians. Below knee amputation was the commonest type of amputation.**

Conclusion: **The occurrence of lower limb amputations from landmine injuries in Iran is a significant burden on the healthcare system; rendering allocation of more resources to provide preventative and rehabilitation measures is therefore a must.**

Archives of Iranian Medicine, Volume 11, Number 6, 2008: 595 – 597.

Keywords: Amputation • Iran • landmine • survivor • war

Introduction

Iran is a country where the physical consequences of war are all too apparent in thousands of victims who have lost their arms and legs because of landmines or other explosive remnants of war. It is estimated that almost 4000 hectares of land in the five western provinces of Iran are infested with about 16 million landmines and other unexploded ordnances (UXOs).[1]

Globally, an estimated 800 persons die each month and 1200 persons sustain nonfatal injuries from landmine-related injuries.[2,3] However, those who have survived from injuries often have complicated, severe, and debilitating physical damage.

Severe limb injury or traumatic amputation produces different levels of tissue damage within the limb; skin, fat, and muscle have variable resilience to injury.[4] Children are more likely to die from landmine injuries than adults, because their smaller size means that their vital organs are closer to the blast of detonating mine.[5,6]

In accordance with well-established indications, amputations are performed because of severe trauma to the limb; lower limb amputation is more common than upper limb amputation.[7] Consequently the victims may lose their respective roles in their family, community, society, and economic state.

This study was performed to provide some insights into the pattern of landmine- and UXO-induced amputations in Iran during 14 years of the study period.

Authors' affiliations: *Sina Trauma and Surgery Research Center, **Janbazan Medical and Engineering Research Center, Tehran, Iran.

•**Corresponding author and reprints:** Farahnaz Falahati MD, Janbazan Medical and Engineering Research Center (JMERC), Tehran, Iran.
P.O. Box: 19615/616
Tel: +98-912-302-5648; Fax: +98-21-224-12502
E-mail: f.falahati@gmail.com
Accepted for publication: 21 May 2008

Materials and Methods

The study population consisted of those who underwent amputation surgery between 1988 and 2003 in western and southwestern provinces of Iran, namely West Azerbaijan, Kermanshah, Khuzestan, Ilam, and Kurdistan.

A total of 3713 persons have been injured or maimed by landmines after ceasefire in 1988. Of them, 1499 have had amputation.

Only true landmine or UXO injuries confirmed by provincial governors were included.

Subjects were all residents of these provinces, had been injured by landmine or UXOs and their documents of accident were confirmed by the local authorities.

Incidents during military exercise and demining activities were excluded from the study. Incidents inside Iraqi territories were also excluded.

The hospital records of all patients were reviewed with focus on the following points: demographic data, pre-hospital care data, and type of injuries and outcome of hospitalization. The files were gathered from three main organizations which are responsible for taking care of these people as well as the provincial governors' records and a standardized questionnaire was completed. All questionnaires were completed by trained physicians.

International classification of disease-10 (ICD-10) as a scaling system was used to characterize the type of injuries.

Data were analyzed by SPSS® for Windows® version 13 (SPSS Inc, Chicago, IL, USA). A P value<0.05 was considered statistically significant.

Table 1. Demographic features and type of injuries.

Demographic characteristics	Frequency (%)
Education	
Illiterate	345 (23)
Elementary	380 (25.4)
Intermediate	191 (12.7)
High school	90 (6)
Diploma and higher	70 (4.6)
Unknown	423 (28.2)
Sex	
Male	1379 (92)
Female	120 (8)
Age	616 (41.1)
≤18 years	883 (58.9)
>18 years	
Type of injuries	
Head	329 (21.9)
Eye	136 (9.3)
Neck	10 (0.7)
Thorax	61 (4.1)
Abdomen	93 (6.2)
Shoulder and upper arm	31 (2.1)
Elbow and forearm	84 (5.6)
Wrist and hand	482 (32.2)
Hip and thigh	110 (7.3)
Knee and lower leg	702 (46.8)
Ankle and foot	408 (27.2)
Burn and corrosions	22 (1.5)

Results

From August 20, 1988 to March 20, 2003 a total of 1499 persons in Iran were reported to underwent amputation surgery due to landmines and UXOs; the crude number of amputation was 1685 limbs or body part losses. The victims were all resided in western provinces of Iran; 33.1% in Kurdistan, 15.1% in Ilam, 22.2 % in Kermanshah, 9.9% in Khuzestan, and 19.8% in West Azerbaijan (Table 1).

Ninety-two percent of the victims were men and 8% were woman. The majority (48.2%) of victims had no or little education.

The mean±SD age of victims at the time of incident was 23±13 years; 41.1% of amputees were 18 years old or less. the most common activity at the time of incident was grazing livestock (29.6%), followed by farming (8.1%), manipulation of an accidentally found mine out of curiosity (7.9%) and playing (4.5%).

Rate of pre-hospital care coverage was 10.6% which involved limb fixation in only 0.7%, and homeostasis in 8.3% of cases. The most common type of amputation was below knee (Table 1).

One and nine-tenth percent of victims had two to four amputations. The mean±SD victim's first hospitalization stay was 12±10 days.

Discussion

Limitations of this study included failing to collect data such as occupation of the victims, distribution and types of landmines in each province as well as disparity of information in existing medical files of some victims. Given the alarming number of injuries associated with landmines and UXOs, however, the results of this study are useful in identification of hot zones and predisposed populations which could pave the way for more comprehensive studies on pattern of casualties associated with landmines and UXOs in Iran and various aspects of the victim's quality of life.

Demining activities in Iran have been underway

for years. However, complete clearance of the infested lands is an agonizingly long lasting process. According to IRMAC reports, between March 2004 and March 2005 alone, some 528 km^2 were cleared, with 252,383 antipersonnel mines, 37,522 anti-vehicle mines and 1,478,508 UXOs discovered and destroyed.[1]

As depicted in this study, women were far less affected than men, however, due to their crucial role in sustaining families in Iranian villages; women's disability could be of extremely disastrous implications rendering gender focused support programs a priority. An alarming number of teenagers were injured while grazing their livestock, which is almost impossible to continue after losing a limb, raising attention to the need for focused social support and rehabilitation programs for these groups. Poor educational status of the victims may be looked at from two perspectives: first is the fact that poor education may have deprived the victims from the vital information they needed to protect themselves; and second, the fact that these people are in need of special educational aids and modalities.

Long delay in reaching medical care increases mortalities and morbidities. Unfortunately, the victims who did receive pre-hospital care in this study were in absolute minority, rendering allocation of more resources to provide pre-hospital care justifiable.

References

1 The International Campaign to Ban Landmines (ICBL). The online Version of Landmine monitor report 2005: Toward a Mine Free world. Available from; URL: www.icbl.org/IM/2005/

2 Office of International Security and Peacekeeping Operations. Hidden killers: the global landmine crisis. Washington, DC: US Department of State, Bureau of Political-Military Affairs; 1994.

3 International Committee of the Red Cross. Anti-personnel mines: an overview 1996. Geneva, Switzerland: International Committee of the Red Cross; 1996.

4 Rabin M, Coupland R M. Amputation for war wounds, International Committee of the Red Cross, Geneva, Switzerland: International Committee of the Red Cross; 1992: 3 – 7.

5 Coupland RM, Korver A. Injuries from antipersonnel mines: the experience of the International Committee of the Red Cross. *BMJ*. 1991; **303:** 1509 – 1512

6 Cobey JC, Raymonds NA. Anti-personnel land mines: a vector of human suffering. *Ann Intern Med*. 2001; **134:** 421 – 422.

7 Coupland RM, Howell PR. An experience of war surgery and wound presenting after 3 days on the border of Afghanistan. *Injury*. 1988; **19:** 259 – 262.