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RESEARCH ARTICLE

WAR THORACIC WOUNDS AMONG CIVILIANS CASUALTIES IN ADEN DURING THE 2015

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Abstract

Thoracic injury during warfare was associated with a high incidence of morbidity and mortality. In wartime, civilians have became a direct target and accounted for one-half to two-thirds of the casualties. We aimed to highlight the incidence and pattern of thoracic injury and its outcomes management among civilians during the war in Aden. This retrospective study was based on the data were prospectively recorded in Medical Registry. There were 84 civilian casualties identified during the study period. Of those, 97.6% of casualties were males and 2.4% were females. The overall mean age was 30.8 ± 9.8 years (range: 10 – 65 years). Of those, 73.8% of casualties were produced by rifle bullets, while 26.2% of casualties were due to fragmentation weapons. Hemopneumothorax was the most common injury patterns. Abdomen injury was the most common associated injuries. Of those, 91.7% of casualties were treated with chest tube insertion alone. Thoracotomy was performed for 7.1% of casualties. The overall complications were 54.8%. Wound infection was the most frequent complications. The overall mortality rate was 3.6%. The overall mean hospital stay was 8.3 ± 5.9 days. We concluded that chest drain is best option for treatment the majority penetrating chest wounds.

Keywords: War, Thoracic injury, Civilians.

1. Introduction

Wars and its challenges have historically afflicted humanity and continue to do so today [1]. Chest wounds represent 4.4 to 33% of all modern combat injuries [2 – 6]. The particular danger of the chest injury is that it threatens the vital transport of oxygen to the tissue [7]. Thoracic injury accounts for significant mortality and morbidity during military conflict [6, 8]. Unfortunately, during war the majority of people injured or dead are civilians [1]. In March 2015, civil war is break out in our country, when Al-Houthis insurgents' militia is invades Aden. This hostile action by Al-Houthis terrorist militia is targets civilians in Aden. In July from same year, Aden is liberates by combatants South resistance and Arabic coalition forces in operation it calls “golden arrow”. In view of the direct target of civilians during this war; also, the lack of previous work in this field forced us to investigate the potential effects of thoracic war wounds on civilians. The purpose of this study is to highlight the incidence, pattern and management of thoracic injury and its outcome among civilians during the war in Aden.

2. Methods

2.1. Patients

We retrospectively reviewed the inpatient records of all civilian patients who sustained significant combat-related thoracic trauma were admitted to 22 May hospital and the International Committee of the Red Cross (ICRC) trauma center in Al-Manssora city which drained “Wounded In Action” (WIA) from all regions of Aden city during the wartime period between 26 March 2015 and 31August 2015. We excluded personnel who were civilian “Killed in Action” (KIA), combatants and patients with road traffic accident injuries.

2.2. Definitions

Chest trauma was defined as any injury between the clavicles superiorly and the twelfth rib inferiorly, which resulted in a clinically significant intrathoracic injury (Defined by author and his coauthors). Standardized epidemiological definitions as used by United States of America (USA) armed forces [6], we used it. KIA was defined as those dying from battle injuries before reaching a medical facility [6, 9]. WIA was defined as those wounded who survive to reach a medical facility [9]. Died of wounds

(DOW) was defined as WIA but dying from wounds later on [6, 9]. Bullet (gunshot) wounds (BWs) defined as any wound as resulted from rifles shoot bullets at high speed (Defined by author and his coauthors). Fragment wounds (FWs) defined as any wound as resulted from fragmentation weapons groups such as shells, rockets, improvised explosive devices (IEDs), grenades and anti-personnel landmines (APM) (Defined by author and his coauthors).

2.3. Data collection

The WIA were studied according to their demographics data (age and gender), wounding agent (Bullet and fragment), injury patterns, associated injuries, thoracic procedures, number of units of blood transfused.

2.4. Outcome endpoints

Primary endpoint was mortality rate and secondary outcome endpoints were survival, complications rates and length of hospital stay (LOS).

2.5. Data analysis

Statistical package for the social sciences (SPSS) version 17.0 (SPSS, Inc., IBM Company, Chicago, IL, USA) was used for data analysis. According to their wounding agents, the WIA were divided into two groups (bullet wounds [BWs] group versus (vs) fragment wounds [FWs] group). The differences between the two groups were evaluated by the Pearson's x^2 for categorical variables and independent samples Student's t-test for continuous variables. Categorical variables were expressed as numbers and percentages. Continuous variables were expressed as a mean with standard deviation (SD). For all analyses, a *P*-value of ≤0.05 was considered statistically significant.

3. Results

A total of 2623 civilian casualties were recorded during the study period, of which (3.2%; 84/2623) civilian WIA sustained thoracic injury (Fig.1). Of the 84 WIA evaluated, (73.8%; 62/84) had sustained BWs and (26.2%; 22/84) had sustained FWs. Of the WIA identified (97.6%; 82/84) were males and (2.4%; 2/84) were females. By group, (100%; 62/62) were males in the BWs group. In the FWs group, (90.9%; 20/22) were males and (9.1%; 2/22) females. There were significant differences between the two groups in terms of gender; (*P* = **0.016**). The overall mean age was 30.8 ± 9.8 years (range: 10 – 65 years). The mean age was similar in both groups (31.3 ± 9.9 years [range: 10 – 65 years] in the BWs group and 29.5 ± 9.4 years [range: 11 – 50 years] in the FWs group; *P* = 0.457). There were no differences between the two groups in terms of mean age (Table 1).

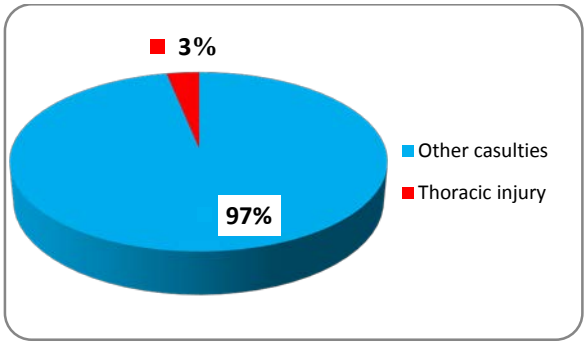

Figure 1: The incidence of thoracic injury among civilian casualties

Of the injuries identified (Table 1), the most prevalent injury was hemopneumothorax, which occurred in (52.4%; 44/84) of WIA (56.5%; 35/62 in the BWs group vs 40.9%; 9/22 in the FWs group; *P* = 0.210). There were no differences between the two groups in terms of injury patterns.

There were (53.6%; 45/84) of WIA with identified associated injuries (45.2%; 28/62 in the BWs group vs 77.3%; 17/22 in the FWs group; *P* = **0.009**). There were significant differences between the two groups in terms of associated injuries. Of the associated injuries identified (Table 2), the most prevalent injury was abdomen injury occurred in (22.6%; 19/84) of WIA (22.6%; 14/62 in the BWs group vs 22.7%; 5/22 in the FWs group; *P* = 0.989). Of all the procedures reported, tube thoracostomy was the most common procedure performed in (91.7%; 77/84) of WIA (90.3%; 56/62 in the BWs group vs 95.5%; 21/22 in the FWs group, no differences in both groups in terms of chest drainage; *P* = 0.454). Thoracotomy was performed in (7.1%; 6/84) of WIA (9.7%; 6/62 in the BWs group vs 0.0% in the FWs group, no differences in both groups in terms of thoracotomy; *P* = 0.130). Of those, (1.6%; 1/62) of patients had severe lung laceration treated by lobectomy; (*P* = 0.549). Other indications were complications occurred in (8.1%; 5/62) of patients had lung laceration treated by tractectomy for stop ongoing bleeding in (4.8 %; 3/62) of patients and air leakage in (3.2%; 2/62) of patients; (*P* = 0.170). One patient (1.6%) in the BWs group had cardiac injury treated by pericardiocentesis for pericardial tamponade and chest tube for hemothorax; (*P* = 0.549). Concomitant laparotomies were performed in (22.6%; 19/84) of WIA. Of 14 patients (22.6%) in the BWs group; 2 patients (3.2%) operated for diaphragm repairs and 12 patients (19.4%) operated for abdominal injuries. While 5 patients (22.7%) in the FWs group only operated for abdominal injuries; (*P* = 0.989). Of the total WIA, (75%; 63/84) of patients received packed red blood cells (pRBC). Transfusion rates in patients with the BWs group were similar in the FWs group; (75.8%; 47/62 vs 73%; 16/22; *P* = 0.839). The overall mean number of transfused pRBC units was 2.2 ± 1.1 pRBC units, (Range1 – 5 units). The mean number of transfused pRBC units was similar in both groups; 2.1 ± 1.1 pRBC units in the BWs group vs 2.2 ± 1.3 pRBC units in the FWs group; (*P* = 0.908). The overall complications occurred in (54.8%; 46/84) of WIA. The complications were slight significant lower in the

BWs group than in the FWs group, (48.4%; 30/62 vs 72.7%; 16/22; *P* = **0.049**). Of the complications following injury (Table 4), the most common complications was wound infection; which occurred in (39.3%; 33/84) of WIA (33.9%; 21/62 in the BWs group vs 54.5%; 12/22 in the FWs group; *P* = 0.088). No significant difference between the two groups in terms of the wound infection. The overall mortality rate was (3.6%; 3/84) for all WIA. The mortality was high significantly lower in the BWs group than in the FWs group (0.00%; 0/62 vs 13.6%; 3/22; *P* = **0.003**). Reasons for death in the FWs group were multiple organ failure due to sepsis in (9.1%; 2/22) of WIA, and respiratory failure due to severe lung contusion in (4.5%; 1/22) of WIA. At the time of discharged home, the overall **short-term** survival rate in both the BWs group and the FWs group was (96.4%; 81/84) of WIA. Survival was significantly better in the BWs group compared with the FWs group (100%; 62/62 vs 86.4%; 19/22; *P* = **0.003**). The overall mean LOS was 8.3 ± 5.9 days for all WIA. The mean LOS was similar in both groups; 8.3 ± 5.3 days in the BWs group vs 8.5 ± 7.4 days in the FWs group; (*P* = 0.920).

Table 1: Demographic and injury patterns characteristics of thoracic trauma based on the wounding agent

Characteristics	Bullets wounds (n= 62)	Fragments wounds (n= 22)	Total (n= 84)	*P*-value
Age (mean ± SD) (years)	31.3 ± 9.9	29.5 ± 9.4	30.8 ± 9.8	0.457
Gender				
Male	62 (100%)	20 (90.9%)	82 (97.6%)	**0.016**
Female	0.00%	2 (9.1%)	2 (2.4%)	
Injury patterns				
Hemothorax	27 (43.5%)	12 (54.5%)	39 (46.4%)	0.374
Pneumothorax	2 (3.2%)	2 (9.1%)	4 (4.8%)	0.267
Hemopneumothorax	35 (56.5%)	9 (40.9%)	44 (52.4%)	0.210
Lung laceration	6 (9.7%)	0.00%	6 (7.1%)	0.130
Lung contusion	6 (9.7%)	1 (4.5%)	7 (8.3%)	0.454
Esophageal injury	0.00%	1 (4.5%)	1 (1.2%)	0.091
Diaphragm injury	2 (3.2%)	0.00%	2 (2.4%)	0.394
Cardiac injury	1 (1.6%)	0.00%	1 (1.2%)	0.549
Rib fracture	2 (3.2%)	0.00%	2 (2.4%)	0.394
Chest wall soft tissue	4 (6.5%)	3 (13.6%)	7 (8.3%)	0.295
Bold value was used to highlight the significant *P*-value (<0.05)				

Table 2: Associated injuries based on the wounding agent

Characteristics	Bullets wounds (n= 62)	Fragments wounds (n= 22)	Total (n= 84)	*P*-value
Head injury	1 (1.6%)	2 (9.1%)	3 (3.6%)	0.104
Face injury	1 (1.6%)	1 (4.5%)	2 (2.4%)	0.438
Abdomen injury	14 (22.6%)	5 (22.7%)	19 (22.6%)	0.989
Pelvis/Buttocks	1 (1.6%)	2 (9.1%)	3 (3.6%)	0.104
Back injury	3 (4.8%)	2 (9.1%)	5 (6%)	0.469
Upper limbs	7 (11.3%)	6 (27.3%)	13 (15.5%)	0.075
Lower limbs	1 (1.6%)	4 (18.2%)	5 (6%)	**0.005**
Pearson's x^2 (*P* = **0.009**)				
Bold value were used to highlight the significant *P*-value (<0.05)				

Table 3: Management of casualties based on the wounding agent

Characteristics	Bullets wounds (n= 62)	Fragments wounds (n= 22)	Total (n= 84)	*P*-value
Observation	0.00%	1 (4.5%)	1 (1.2%)	0.091
Thoracostomy tube	56 (90.3%)	21 (95.5%)	77 (91.7%)	0.454
Thoracotomy	6 (9.7%)	0.00%	6 (7.1%)	0.130
Tractectomy	5 (8.1%)	0.00%	5 (6%)	0.170
Lobectomy	1 (1.6%)	0.00%	1 (1.2%)	0.549
Pericardiocentesis	1 (1.6%)	0.00%	1 (1.2%)	0.549
Laparotomy for diaphragm repairs	2 (3.2%)	0.00%	2 (2.4%)	0.394
Units of blood transfused (mean ± SD) (units)	2.1 ± 1.1	2.2 ± 1.3	2.2 ± 1.1	0.908

Table 4: Complications based on the wounding agent

Variables	Bullets wounds (n= 62)	Fragments wounds (n= 22)	Total (n= 84)	*P*-value
Wound infection	21 (33.9%)	12 (54.5%)	33 (39.3%)	0.088
Pneumonia	3 (4.8%)	1 (4.5%)	4 (4.8%)	0.956
Atelectasis	12 (19.4%)	3 (13.6%)	15 (17.9%)	0.547
Sepsis	2 (3.2%)	2 (9.1%)	4 (4.8%)	0.267
Empyema	2 (3.2%)	0.00%	2 (2.4%)	0.394
Persistent pneumothorax	2 (3.2%)	0.00%	2 (2.4%)	0.394
Persistent hemothorax	3 (4.8%)	0.00%	3 (3.6%)	0.293
Retained hemothorax	1 (1.6%)	0.00%	1 (1.2%)	0.549
Respiratory failure	0.00%	1 (4.5%)	1 (1.2%)	0.091
Multiple organ failure	0.00%	2 (9.1%)	2 (2.4%)	**0.016**
Pearson's x^2 (P = **0.049**)				
Bold value were used to highlight the significant *P*-value (<0.05)				

Table 5: Patients outcome based on the wounding agent

Variables	Bullets wounds (n= 62)	Fragments wounds (n= 22)	Total (n= 84)	*P*-value
Complications rate	30 (48.4%)	16 (72.7%)	46 (54.8%)	**0.049**
Mortality rate	0.00%	3 (13.6%)	3 (3.6%)	**0.003**
Survival rate	62 (100%)	19 (86.4%)	81 (96.4%)	**0.003**
Length of hospital stay (mean ± SD) (days)	8.3 ± 5.3	8.5 ± 7.4	8.3 ± 5.9	0.920
Bold value were used to highlight the significant *P*-value (<0.05)				

4. Discussion

The chest, forming such a large and exposed part of the body and containing such vital structures as the heart and lungs, is particularly vulnerable to trauma. While in civil practice grave thoracic injuries are relatively infrequent, in military practice chest wounds assume serious and significant importance [5]. Previous accounts of war injury have limited reporting on civilians (noncombatants) [6]. In this study, we report the rate of thoracic injury is 3.2% among civilian casualties in Aden city during war. In compare to these reported in the former wars; 5% in Arab-Israeli war, 1973 (Israel [9]); 5% in Lebanon, 1982 [9]; 8% and 12% in the Gulf war II, (1990 – 1991) (USA [4]), (France [10]) and (United Kingdom [UK [8]]) respectively; 8 % in Somalia: Mogadishu, 1992 (USA [9]); 6.5% and10 % in Gulf war III, 2003 (UK [11]) and (USA [4]) respectively; 3.3% in Syria, since 2011 to the time of writing (Turkey [1]). Our figure of incidence is low; this attributed to our study involved only civilians whereas their figures reflect both combatants and civilians injuries. In urban war, civilians comprise 50 – 90 % of injured individuals during armed conflicts [1, 4, 6, 9]. In our study, the civilian populations are vulnerable to thoracic trauma than combatants; this may be attributed to the civilians not protected by body armor as combatants.

The mechanism of thoracic injury in modern battle has shifted from conventional “penetrating wounds” to blast injury [6, 12]. As in the conventional war fighting, our study showed penetrating wounds of the chest represent the principal mechanism of injury in all casualties; caused by rifle bullets and fragmentation weapons (projectiles). In our study, injuries from gunshot more frequent than injuries due to fragments. This can be explained by the fact that, nature of combat “urban fighting” is largely street fighting with rifles as needed to use by combatants other than fragmentation weapons. Our study is in agreement with the results from the military literature showed that; penetrating injuries are the main mechanism of thoracic wounding in Lebanon (1982 – 1992) [8, 13], Croatia (1991 to 1992) [13], Bosnia and Herzegovina (1992 – 1995) [3], Somalia (1992, USA [14]), Iraq (2003, UK [11] and USA [4]), Afghanistan (2009 – 2013, France [10] and USA [4]), and Syria (2011- time of writing, Turkey [1]) wars. However, in contrast to our study, blast injuries are the main mechanism of thoracic wounding in the recent conflicts, with peaks in Iraq in 2007 and Afghanistan in 2009 [8, 10, 12]. This can be explained by the fact that; the increased use of IEDs in these asymmetrical wars.

Notably, injury patterns in the current conflict are vastly different [4, 6]. The difference in injury patterns may be attributed to the type of conflict and the nature of the weapons used. In the main of our patients manifested as hemopneumothorax. The reason for this result can be explained by the penetrating injuries cause lung lacerations and results in hemopneumothoraces. In contrast to our study, hemothorax is the most common thoracic injury during the civil wars in Croatia [13], Afghanistan (2009 – 2013, France [10]) and Somalia [2]. On the other hand, due to changes in the injury mechanisms, during the wars in Iraq in 2007 and Afghanistan in 2009 as we mentioned previously [8, 12]. In these wars, the most prevalent injury is lung contusion “blast lung”. The lungs are particularly vulnerable to this form of injury; because of their air-filled alveoli and delicate vascular structure [12]. This effect can be explained by the mechanism of sudden rise in intrathoracic pressure causes alveolar disruption and parenchymal bleeding [5].

The therapeutic goal in the war scenario is to restore normal physiology and thereby to restore cardiac and pulmonary function [5]. These management principles are especially important as thoracic trauma impacts directly

on the heart and lungs, the two organs most integral to the provision of oxygenation and perfusion [7]. Tube thoracostomy was the main treatment modality for the majority of our patients; this is very similar to previously published results [6, 8 – 10]. The reason for this result mainly attributed to intrathoracic bleeding is self-controlled, that is based on our clinical observation. In their paper, Demetriades and Velmahos [15] offer the best explanation for this clinical observation; bleeding from peripheral lung lacerations or an intercostal venous injury is self-controlled, due to the low-pressure vascular system and the rich concentration of tissue thromboplastin in the lungs. This may also help to explain why the penetrating lung injuries rarely need operative repair? Our study supports this finding.

In our study, injuries due to bullets had 9.7-fold higher incidence of thoracotomy than fragments injuries (9.7 vs 0%, $P = 0.130$). The explanation may be related to a high-velocity bullet imparts kinetic energy to pulmonary parenchyma, a temporary cavity forms with traction forces on lung tissue, and result in disruption it causes bleeding and air leaks "lung lacerations". In our study, 6 patients with lung lacerations underwent thoracotomy. Our main indication of immediately thoracotomy in one case was intrathoracic severe bleeding, while late thoracotomies were performed to control persistent bleeding in 3 cases and persistent air leaks in 2 cases. The indication for thoracotomy in our study was like other authors [3, 6, 13, 15 – 18]. Notably, figures of thoracotomies are may vastly varies in different conflict zones. Compared with previous wars, our figure thoracotomy was (7.1%). Morrison *et al*. [18] report on 22 patients (12.7%) undergoing thoracotomy in the Afghanistan conflict. Al-amran [16] reports on 520 patients (63.4%) undergoing thoracotomy for lung injuries in the Iraq conflict. Kristek *et al*. [17] report on 144 patients (91.7%) undergoing thoracotomy for lung injuries in the Croatia conflict. These differences might be reflecting the greater severity of mode of injury and difference between the treatment protocols during the war in those centres.

In both historical and current conflicts, hemorrhage is the leading cause of death in military casualties [1, 18]. Therefore, pRBC are commonly transfused aimed at increasing oxygen delivery to tissues, although, during their storage, morphological and biochemical changes adversely affect this ability [19]. Our results showed that 75% of patients required pRBC transfusions with an average of 2.2 units per patient. This is a fairly large number and likely reflects the severity of the injury as well as the presence of associated injuries (53.6%) in our study. This finding is consistent with other studies like; Propper *et al*. [6] reported that 50% of admissions required pRBC transfusions with an average of 3 units per patient in Iraq and Afghanistan wars. Hakimoglu *et al*. [1] reported that needed pRBC transfusions with an average of 3.4 units per patient in Syria war. Hassan *et al*. [20] reported that an average of 4 units of blood per patient was transfused during Somalia war. In wartime, due to lack of heterologous blood in situations that demanded lifesaving blood transfusions [2]. All our patients received donor blood (all otransfusion). In contrast to our study, Ahmed *et al*. [2] report on 137 patients with massive hemothorax was transfused with their blood (autotransfusion "autogenous") in Somalia war. ICRC [21] and Western Trauma Association (WTA, USA [22]) recommended the first and foremost indication for autotransfusion is the need for an emergency source of blood in acute and massive hemorrhage, especially from the thorax and abdomen. Previous our experience in Basuheeb military general hospital with this kind of autotransfusion during the War on Terror in Abian (2011 – 2014) revealed that it safe and effective. The clean intrathoracic blood may be filtered and used as an autotransfusion. Due to the fact that the blood in the pleural cavity is defibrinated (fibrinogen removed), this fact can be explained by blood collected from pleural cavity is defibrinated by a combination of mechanical factors (contact with functioning heart and lungs) and biochemical interactions with serosal surfaces. With the fibrinogen removed, anticoagulation before re-infusion is not required to add to the blood container [2, 21].

Associated injuries appear to play an important role in outcome. Our results showed that abdomen injury was the most common associated injuries. Our study is in agreement with the results from Afghanistan (2003 – 2013) by de Lesquen *et al*. [10] and by Poon *et al*. [8], Iraq (2003–2011) by Poon *et al*. [8], Croatia (1991 – 1995) by Kristek *et al*. [17], Syria (2012 – 2013) by Günay *et al*. [23] (Turkey), and Bosnia and Herzegovina (1992 – 1995) by Dediæ *et al*. [3].

The overall complications occurred in 54.8% of our patients. Our results showed that wound infection was the most frequent complications. Our finding which corroborates previous reports from civil wars in Bosnia and Herzegovina [3] and Croatia [13]. This finding is due to the fact that armed conflict where wounds are dirty and contaminated from the very beginning. Overall casualty mortality is the combination of the DOW and KIA rates [6]. For this reason mortality data; however, do not reflect the extent and severity of war injuries [9]. The overall mortality rate from thoracic injury in our results was 3.6%. The low mortality rate in our results may be due to the fact that many patients died before reaching the hospital. Our mortality rate was lower when compared with those in Bosnia and Herzegovina (26.1%) [3], Croatia (14.7%) [17], and Iraq and Afghanistan (12%) [6] wars. Hemorrhage and sepsis have remained the main causes of mortality throughout twentieth century warfare [8]. However, thoracic trauma, per se, is not an independent predictor of mortality, suggesting that overall injury burden is more important [8]. It is clear that mortality is significantly impacted by the presence of associated injuries. Poon *et al*. [8] concluded that severe head or abdominal injuries in conjunction with thoracic trauma are independent predictors of mortality. Our finding strongly corroborates this conclusion on the effect of associated injuries, as the risk of death. In our study, sepsis due to abdominal injuries the main cause of death in 2 cases, whereas severe lung contusion due to thoracic trauma the main cause of death in one case. On the other hand, overall survival rate was higher in our patients. Accordingly, the variations in degree of intrathoracic hemorrhage and severity of associated injuries may be explained by the period of survival in our patients.

By this we also hoped that our results could shed light on our wartime surgical practice. Finally, the significance of thoracic trauma lies in the fact that it is more likely to be complicated by greater disturbance in the cardiorespiratory physiology, by extensive tissue damage, by retention of a foreign body, and by consequent infection. Early diagnosis and immediate treatment of life-threatening injuries following penetrating thoracic trauma are of vital importance. In general, knowledge of the new advancements in the field of thoracic trauma will allow surgeons to provide expert care and improved outcomes [15]. However, our study suffers from a few limitations that must be taken into account when the results are interpreted. Firstly, this is a retrospective study and some data that may affect the outcomes are missing. Secondly, short – term outcomes (the follow-up period at hospital), so we have no data of mid-term complications or late deaths after discharge home. Thirdly, it is two-centre review from three that worked at wartime. Unfortunately, a doctor without border organization (Medecins Sans Frontieres [MSF]) is refuses to provide us with data. Lastly, no data are collected on civilians who die at scene. The lack of these data may be a bias in our study.

5. Conclusion

The outcome for the majority of our patients with penetrating chest wounds is excellent. The chest drain is best option for treatment penetrating chest wounds. It is more effective, safer and alone sufficient treatment in most cases. Otherwise, in case of hemodynamic instability, thoracotomy is the procedure of choice. The presence of associated injuries is prognostic factor rather than thoracic injury alone for mortality.

Conflict of interest statement

The authors have no financial and personal relationships with other people or organizations that could inappropriately influence their work.

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مقالة بحثية

جروح الحرب الصدرية بين المصابين المدنيين في عدن أثناء عام 2015

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الملخص

ارتبطت إصابة الصدر أثناء الحرب بنسب حدوث عالية للمرضية و الوفيات. وفي زمن الحرب، حيث أصبحوا المدنيون هدفاً مباشر لها وتتسبّب في نصف إلى ثلثي الإصابات بينهم. ولذلك هدفنا إلى إبراز الأهمية الخاصة لإصابة الصدر من حيث مدى الحدوث والنمط ونتائج إدارة علاجها بين المدنيين أثناء الحرب في عدن. وهذه دراسة ذات منهج اسْتعادِيّ، استندت على استعادة بيانات لأحداث ماضية كَانتْ قَدْ سُجّلتْ وقت النظر في سير تطور حدوثها في السجل الطبّي. كَانتْ هناك 84 إصابة مُيّزتْ بين المدنيين أثناء فترة الدراسة. ومن تلك الإصابات، 97.6٪ كَانتْ ذكور و 2.4٪ كَانتْ إناث. متوسّط أعمارهم كَانَ 30.8 ± 9.8 سنة (بمدى يتراوح : 10 – 65 سنة). و من تلك الإصابات، 73.8٪ كَانتْ ناتجة عن رصاص بندقية، بينما 26.2٪ إصابة كَانتْ ناشئة عن أسلحة متشظّية. دم الاسترواح الصّدري كَانَ أكثر أنماط الإصابة شيوعاً. إصابة البطن كَانتْ أكثر الإصابات المُصاحبة شيوعاً. تفْمِيم الصّدر بإدخال أنبوب كَانَ الإجراء العلاجي الوحيد ل 91.7٪ من الإصابات. شَقّ الصّدر الاستقصائي أُجْري ل 7.1٪ من الإصابات. نسبة المضاعفات كَانتْ 54.8٪. عدوى الجرح كَانتْ أكثر المضاعفات شيوعاً. نسبة الوفيات كَانتْ 3.6٪. متوسّط البقاء في المستشفى كَانَ 8.3 ± 5.9 أيام. و اِستنتجنا بأنّ استفراغ الصّدر بإدخال أنبوب كَانَ الخيار الأفضل للمعالجة أغلبية جروح الصّدر المخترِقة (النافذة).

الكلمات المفتاحية: الحرب، إصابة الصدر، المدنيين.