ORIGINAL ARTICLE

Characteristics of the injuries of Syrian refugees sustained during the civil war

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ABSTRACT

BACKGROUND: During a war, many civilians are severely injured by firearms, bombs, and shrapnel. The triage of war injuries involves difficult and complicated processes requiring surgical procedures and patient monitoring in the Intensive Care Unit (ICU) of hospitals. In this study, we examine the demographic, traumatic, and critical care characteristics of cases injured during the civil war in Syria and requiring emergency surgery.

METHODS: Electronic data of the traumatic, surgical, and ICU monitoring features of 707 patients admitted to Kilis Public Hospital between March 2012 and January 2013 were analyzed retrospectively

RESULTS: Most of the patients reported having been injured due to firearms (83.75%). Of the 707 cases studied in this work, 93.2% was male. Male patients reported a mean age of 26.1±12.1 years, while pediatric cases reported a mean age of 11.7±3.41 years. The most frequently injured region of the body was the head–neck region (52.7%). The New Injury Severity Score (NISS) of the cases was 42.5±11.2 and their American Society of Anesthesiologists (ASA) score was 3.2±0.7. The number of cases with intraoperative exitus was 7, while the number of cases who had undergone damage control surgery was 204. The number of cases hospitalized in the ICU during the postoperative period was 233, and the average hospitalization duration in the ICU was 4.67±1.32 days. Among survivor patients, the first 24-hour invasive measurements (i.e., pH, hemoglobin, body temperature, and mean arterial blood pressure) and international normalized ratio were found to be high. The number of blood products used for surviving patients was fewer relative to that used for non-surviving patients, and these NISS of these patients was 29.7±10.1. The mortality rate of all patients followed up in the ICU after emergency surgery was 45%, and neurosurgical cases showed the lowest level of survival (24.1%).

CONCLUSION: The results of this study indicated that head–neck, chest–abdomen, and multiple body injuries are the most widely seen among civilians brought to Turkey because of gunshot injuries sustained during the Civil War in Syria. The number of emergency operations performed in the study sample was high, and critical care follow-up durations were long. In addition, the NISS and ASA scores of mortal cases were fairly high.

Keywords: Injury characteristics; refugees; Syria's civil war.

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INTRODUCTION

Wars date back to the beginning of human history. About 1.6 million lives worldwide are lost annually because of gunshot injuries, and deaths during continuing wars constitute approximately a fifth of these cases.[1] Besides adults, children also suffer from the war (Fig. 1). Because of injuries caused by war weapons, fragmentation, and blast effect, wars require emergency teams and operations working in the field to develop new trauma approaches. The severity of the injuries of soldiers and civilians sustained during the war further require

innovative surgical treatment and intensive care follow-up processes of these cases. Because of the difficulties associated with providing pre- and intra-hospitalization emergency healthcare services under war conditions, triage systems (e.g., SAMPLE) and trauma scoring systems (e.g., New Injury Severity Score (NISS)) featuring improved efficiency have been established. The Damage Control Surgery (DCS) and Damage Control Resuscitation (DCR) practices are among the newer approaches utilized in the war surgery domain.[2,3] In this study, we aimed to contribute to the literature on the treatment of way injuries by evaluating the clinical characteristics of injured cases as well as the characteristics of surgical, critical, and intensive care treatment under war conditions.

MATERIALS AND METHODS

After obtaining permission from local authorities, files of Syrian refugee patients admitted to the Emergency Department (ED) of Kilis Public Hospital (Turkey) were examined retrospectively. A total of 8,318 Syrian Refugee Patients were enrolled from March 2012 to January 2013. Within this group, 707 trauma patients required emergency operation. All of the surgical patients were given general anesthesia with 1 mg/kg, 0.01–0.03 mg/kg midazolam, and 1 mg/ ropivacain kg and then intubated. At least two intravenous (IV) lines with a 16G intracath were started, and urinary bladder and nasogastric catheters were inserted. Arterial and central venous catheters were also placed to monitor blood pressures. Temperature was measured by an oropharyngeal probe, and blood samples were collected to determine blood gases, complete blood count, biochemistry, and crossmatch for blood transfusion. Hydroxyethyl starch, O Rh (-)-type blood infusion, and inotropic agents were started when needed. All patients were heated with air warmer blankets, and all fluids were heated prior to administration. Fluid and blood transfusions were given according to central venous pressure and urinary output.

The decision to initiate DCS was based on standard DCS inclusion criteria (i.e., injury severity score ≥25, systolic blood pressure <70 mmHg, body temperature <34 °C, and blood pH <7.1).[4] Following surgery, DCS patients were transferred to the intensive care unit (ICU) of the hospital while intubated and provided midazolam and remifentanil infusion. Patients were evaluted for blood gas, hemoglobin, biochemical parameters, and body temperature, and intra-abdominal pressure was measured indirectly via a urinary catheter intravesicular probe. All patients were extubated when considered stable.

The data analyzed include surgery type, blood and fluid transfusion requirements, inotropic use, length of total ICU stay, mechanical ventilation duration, blood gas values, hemoglobin, and four temperature values: pre-operation, post-operation, first hour in the ICU, and 24 hours after admittance to the ICU.

Statistical Analysis

Research data were processed and analyzed using the SPSS software package (version 16.0; SPSS Inc., Chicago, IL, USA). Data are presented as numbers and percentages for categorical variables and as mean±standard deviation for quantitative variables. A value of $p<0.05$ was considered significant in all analyses.

RESULTS

Over a span of 10 months (March 2012–January 2013), a total

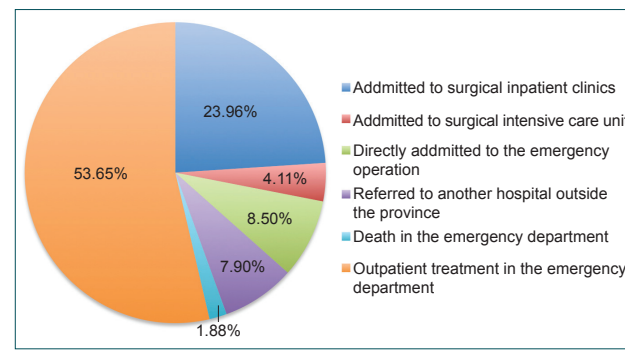

Figure 2. Fate of injured Syrian refugees admitted to the Emergency Department (n=8.318).

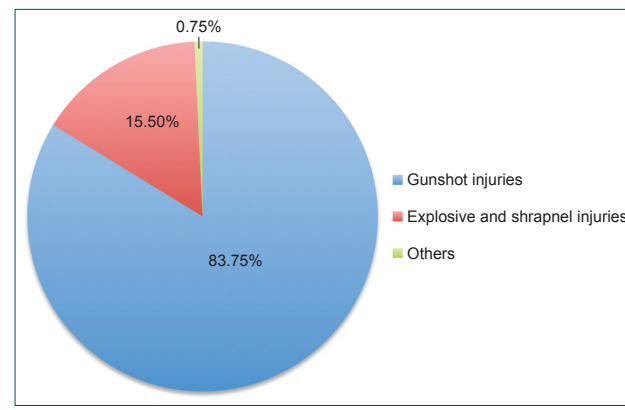

Figure 3. Causes of injury among Syrians admitted to the Emergency Department (n=8.318).

Figure 1. A Syrian child suffering from the effects of civil war (courtesy of Mr. Lokman HAPPANI-war reporter).

number of 8,318 injured persons were admitted to the ED of Kilis Public Hospital from the southern border of Turkey. More than half of these patients were treated as outpatients (4,463 cases, 53.65%), and approximately a quarter of the cases were treated by hospitalization in surgical clinics (1,993 cases, 23.96%). Approximately 1 of every 25 traumatic cases taken to the ED was directly accepted to the ICU (342 cases, 4.11%), and 1 of every 44 traumatic cases died during admission to this department (156 cases, 1.88%). The numbers of traumatic patients referred out of the city and those requiring emergency surgery were similar and accounted for less than 10% of the traumatic cases admitted to the ED (Fig. 2).

Some of the cases were directly accepted from the ED to the ICU (342 cases, 4.11%) and underwent DCS by volunteer surgeons under poor healthcare conditions. Nineteen cases (5.5%) underwent DCS in Syria.

The most frequent reason for injury was gunshot (6,966 cases, 83.75%), and the effects of injuries caused by firearms were very significant. Explosives and shrapnel (1,290 cases, 15.5%) were the second most-frequently reported cause of injury. Among explosive-caused injuries, bomb attacks, and landmines were the most prominent (Fig. 3). Other reasons for injury included being trapped in the wreckage of buildings during bombing, falls, and traffic accidents (62 cases, 0.75%).

Most the traumatic cases directly taken from the ED to surgery (707 cases, 8.5%) were male (659 cases, 93.2%), and their mean age was 25.8±12.7 years. The mean age of 84 pediatric and adolescent cases was 11.7±3.41 years (range, 1–18 years). A significant difference was found in terms of sex (p=0.006). The most frequently injured region of the body was the head–neck area (373 cases, 52.7%), followed by the thorax, abdomen, and backplane–dorsal area (197 cases, 27.8%). Traumatic cases admitted to emergency surgery showed very high NISS and American Society of Anesthesiologists (ASA) scores (Table 1).

In terms of the distribution of emergency operations (707 cases, 754 emergency operations) by surgical department, most of the patients required orthopedic, general surgical, and plastic surgical operations. Among these departments, the intraoperative mortality rate and number of patients requiring monitoring in the ICU after emergency surgery were found to be the highest in general surgical patients (Table 2).

The number of semi-elective operations performed on the patients was 3,454, and the number of cases referred to hospitals in other cities was 456 (Fig. 2). Among emergency cases, most of the femoral fracture operations were performed by the Orthopedics and Traumatology departments (94 cases, 37%). Most the plastic and reconstructive surgical (PRS) cases reported burns due to various firearms (91 cases, 75.8%).

The top three multidisciplinary departments carrying out emergency operations (93 operations, 12.3%) were the General Surgery and Thoracic Surgery departments (36 operations, 38.7%), the General Surgery and Urology departments (15 operations, 16.1%), and the Orthopedics and Cardiovascular Surgery (CVS) departments (10 operations, 10.7%).

Among 233 cases admitted to the ICU after emergency surgery, the hospitalization duration of survivors was significantly shorter than those of intubated and exitus cases (p=0.001). Similarly, the arterial blood pH of survivors was significantly higher than those of intubated and exitus cases (p=0.001), and the blood hemoglobin, body temperature, and mean arterial blood pressure (MABP) values of the former were significantly higher than those of the latter (p=0.001, p=0.001, and p=0.002, respectively). The International Nor-

Table 1. Characteristics of cases directly admitted from the Emergency Department to the operating room (n=707)

Parameters	n	%	Minimum–Maximum	Mean±SD
Age (years)				
Male	659	93.2	1–67	26.1±12.1
Female	48	6.8	1–65	22.2±17.8
All patients	707	100	1–67	25.8±12.7
Injured body parts				
Head-Neck	373	52.7	–	–
Chest-Abdomen-Back	197	27.8	–	–
Extremities	39	5.5	–	–
Multiple parts (3+)	98	13.8	–	–
New Injury Severity Score (0–75)	707	100	11–75	42.5±11.2
American Society of Anesthesiologists Score (0–6)	707	100	1–5	3.2±0.7

SD: Standard deviation.

Table 2. Distribution of emergency operations by surgical department and outcome (n=707)

Departments	All	Pediatric	Damage control surgery	Exitus	Intensive care unit
Orthopedics	254	26	91	–	9
General surgery	148	–	69	3	77
Plastic and reconstructive surgery	120	17	–	–	11
Thoracic surgery	95	5	17	1	50
Neurosurgery	76	19	27	2	73
Cardiovascular surgery	35	4	–	1	6
Ophthalmic surgery	17	10	–	–	–
Pediatric surgery	6	6	–	–	6
Others	3	1	–	–	1
Total	754	88	204	7	233

malized Ratio (INR) values of survivor cases were significantly higher than those of intubated and exitus cases (p=0.002), and the amounts of erythrocyte suspension (ES) and fresh frozen plasma (FFP) used by the former were significantly less than those required by the latter (p=0.001 and p=0.002 respectively). The NISS values of survivor cases were found to be significantly lower than those of intubated and exitus cases (p=0.003) (Table 3).

The top three surgical cases followed up in the ICU by intubation after emergency operation (83 cases) included neurosurgical cases (40 cases, 48.1%), general surgical cases (21 cases, 25.3%), and thoracic surgical cases (15 cases, 18%). The highest survival rate was observed in PRS cases (admitted, 11; survived, 11; survival rate, 100%), while the lowest survival rate was observed in neurosurgical cases (admitted, 73 cases; survived, 18 cases; survival rate, 24.6%) (Table 4).

Among patients who underwent DCS (204 cases), the highest mortality rates within the first 24 and 72 hours after surgery were reported in neurosurgical patients (6 cases, 22.2% and 15 cases, 55.5%, respectively). By comparison, the lowest mortality rates within the first 24 and 72 hours after surgery were reported in orthopedics patients (0 cases, 0% and 1 case, 1.09%, respectively) (Table 5).

The number of complications that developed in general surgery cases with DCS (69 cases) during the first 72 hours of

Table 3. Clinical characteristics of cases admitted to the ICU after emergency operation (n=233)

Parameters	All patients	Intubated	Exitus	Survivor
	Mean±SD (Min.–Max.)	Mean±SD (Min.–Max.)	Mean±SD (Min.–Max.)	Mean±SD (Min.–Max.)
Length of stay (day)	4.67±1.32 (1–65)	3.27±1.01 (1–27)	5.13±1.76 (1–41)	2.74±1.12 (1–16)
Invasive measurements				
(ICU 24th hour)				
Arterial blood pH	7.41±0.02	7.34±0.09	7.34±0.21	7.43±0.02
Hemoglobin (g/dL)	10.3±0.71	9.6±1.1	9.9±0.8	10.7±0.5
Body temperature (°C)	35.9±0.51	35.1±0.74	35.4±0.79	36.1±0.42
MAP (mmHg)	74±8.1	71±5.7	67±9.8	84±4.3
Use of blood products				
ES (Unit)	2.4±0.80 (1–9)	2.7±1.16 (1–8)	2.4±1.05 (1–9)	2.2±0.45 (1–6)
FFP (Unit)	2.0±0.48 (1–6)	1.9±0.33 (1–4)	2.3±0.63 (1–6)	1.7±0.21 (1–2)
Prothrombin time				
INR	1.2±0.4	0.97±0.2	0.93±0.3	1.46±0.7
New Injury Severity Score	44.7±11.2	35.2±7.9	61.4±15.8	29.7±10.1

ICU: Intensive Care Unit; SD: Standard deviation; Min.: Minimum; Max.: Maximum; MAP: Mean arterial pressure; ES: Erythrocyte suspension; FFP: Fresh frozen plasma; INR: International normalized ratio.

Table 4. Survival rates of cases admitted to the ICU after emergency operation by surgical department (n=233)

	Outcomes			
Departments	**Admission**	**Intubated**	**Exitus**	**Survivor**
Neurosurgery	73	40	55	18
General surgery	77	21	36	41
Thoracic surgery	50	15	8	42
Orthopedics	9	–	2	7
Plastic and reconstructive surgery	11	1	–	11
Cardiovascular surgery	6	4	3	3
Pediatric surgery	6	2	1	5
Others	1	–	–	1
Total	233	83	105	128

Table 5. Mortality rates of cases who underwent DSC in the ICU (n=204)

		Mortality rates			
		First 24 hours		First 72 hours	
Departments	**DCS**	**n**	**%**	**n**	**%**
Orthopedics	91	0	0	1	1.09
General surgery	69	4	5.7	9	13
Neurosurgery	27	6	22.2	15	55.5
Thoracic surgery	17	3	17.6	3	17.6
Total	204	13	6.3	28	13.7

ICU: Intensive care unit; DCS: Damage control surgery.

admittance was 26. Specifically, sepsis developed in 12 cases, adult respiratory distress syndrome (ARDS) developed in 9 cases, disseminated intravascular coagulation (DIC) developed in 3 cases, and acute tubular necrosis (ATN) developed in 2 cases. By comparison, the number of complications that developed in thoracic surgery patients with DCS (13 cases) during the first 72 hours of admittance was found 4 (i.e., ARDS in 1 case and sepsis in 3 cases).

DISCUSSION

The firearms used in war feature high kinetic energy and unique bullet structures. Thus, the level and variety of damage inflicted by these weapons on the viscera differ from those observed from civilian firearms. Visceral injury-related deaths because of shrapnel injuries, which are not observed in civilian life, and the blast effects of bombs are most frequently observed in wars. Weapons of mass destruction are created to present specific injurious and mostly lethal features.[5–8]

Recent studies on Syrian refugees have shown that the number of injured patients who have been brought to Turkey in the early years of the Syria's Civil War (between 2011 and 2013) was very high. In a previous study carried out in Hatay, Karakuş et al. found that the total number of cases admitted to Mustafa Kemal University Research and Training Hospital over a14-month period (from June 2011 to July 2012) was 1,355; of this number of cases, 482 (35.6%) were taken to the ED, 94.6% were referred to outpatient treatment, 4.6% died in the ED, and less than 1% were referred to other medical centers.[9] In their study in Kashmir, Mushtaque et al. found that 59% of the injured individuals reporting to the ED were referred to outpatient treatment.[10] Hakimoglu et al., in a study involving patients admitted to MKU Research and Training Hospital's Reanimation ICU for 6 months (2012), reported that the number of injured Syrian refugees who were hospitalized in the perioperative period was 364.[11] This result is also consistent with the number of cases requiring emergency surgery (perioperative) we observed in our study for the same period. In both studies, most the cases was noticeably male and their mean ages were between 21 and 30 years.

Especially young men and children have been injured during Syria's civil war. The demographic findings in our study are consistent with those reported in previous studies (Karakus and Hakimoglu). However, in our study, the total number of injured Syrian refugees taken to our ED over a 10-month period (2012–2013) was 8,318. The number of cases referred to outpatient treatment in our study is lower than that reported by Karakuş et al. but close to that determined in Mushtaque et al.'s study, which involved a wider series and similar conditions. During civil wars in the last 50 years, in-hospital mortality rates have been reported between 1.8% and 8.5%.[10] The exitus rate found in our study (1.88%) is within these limits. The higher number (7.9%) of referred cases found in our study in comparison with those reported in previous may be mainly attributed to the transfer of many patients with complicated injuries to hospitals closer to the border and also it may be related to exceeding the hospital capacity in a short time (Fig. 2).

Studies by Karakuş et al. and Zeren et al. on injured Syrian refugees revealed that the most frequent reason for injury is gunshot, followed by explosives and shrapnel.[1,9] In their postmortem examination of 186 Syrian refugees who died during the war, Çelikel et al. reported that the most frequent injuries leading to death were those caused by explosives and shrapnel followed by gunshots.[7] The results of our study are consistent with those of Karakuş et al. and Zeren et al.

In their study on individuals injured during the civil war in Kashmir, Mushtaque et al. determined that the most frequent injuries sustained by civilians were upper-extremity injuries, followed by thorax–abdomen injuries, head–neck–face injuries, and burns. Cardiovascular, ophthalmologic, and urologic injuries were relatively less reported.

The possibility of multiple injuries sustained in a war is fairly high.[1,9,12] In their postmortem examination of Syrian refugees injured in civil war, Çelikel et al. reported that the most frequent injuries observed were head–neck injuries, followed by thorax–abdomen–backplane injuries, multiple injuries, and extremity injuries.[7] Our study results are consistent with those of Çelikel et al. in terms of the distribution of injury locations.

Çelikel et al. reported NISS values of 43.0±21.5 among non-survivors of civil war. The mean NISS scores of our injured patients were consistent with those recorded in this previous study, and our ASA scores were quire high.[12] This finding may be attributed to high numbers of severely traumatic and exitus cases recorded in our work.

The literature reports that the proportion of women injured in civil wars after World War II varies between 9% and 12% while that of children varies between 5% and 10%.[1,9,12,13] The percentages of women taken to emergency surgery (6.8%) and children (10.6%) in the present work were consistent with similar reported studies. The lower proportions of women and children injured in the war in comparison with the proportion of men may be explained by the fact that the two former groups do not actively participate in the war and, instead, live in residential areas. The distribution of pediatric cases requiring emergency surgery by surgical department shows some similarity with that of adult cases. The majority of cases treated by the PRS department suffered from burns, likely due to the frequent use of firearms in war.

According to Midwinter, the factors to consider when deciding on the DCS approach include high-energy blunt trauma, multiple body penetration, hemodynamic stability, coagulopathy and/or hypothermia. In complex cases, major abdominal vascular injuries together with multiple visceral injuries, multifocal or multicavity hemorrhage together with visceral injuries, primary multiple regional injuries are also considered. Severe metabolic acidosis (pH <7.30), hypothermia (body temperature <35 °C), duration of resuscitation, and operation longer than 90 minutes are considered critical factors, and coagulopathy and massive transfusion (>10 units of PRBC) are applied as indicators of non-mechanical hemorrhage development.[4] In a previous study, the criteria adopted for making a DCS decision are ISS >25, systolic blood pressure <70 mmHg, core body temperature <34 °C, and pH <7.1.[14]

Only a limited number of DCS cases carried out on individuals injured during the Syrian Civil War have been reported.[15] In our study, 204 patients meeting the criteria were subjected to DCS in our hospital. Among these patients, those with the lowest survival rates were neurosurgical, thoracic surgical, and general surgical patients; this fact is consistent with the distribution of injuries from gunshots, explosives, and shrapnel throughout the body and indicates that these types of injuries present vital consequences to patients.

In their study on injured Syrian refugees hospitalized in the ICU after civil war, Ozdogan et al. reported the mean hospitalization duration of these cases to be 12 days.[16] The mean hospitalization duration in emergency surgery intensive care in our study was shorter (4.67±1.32 days) than that observed by Ozdogan et al. We were unable to obtain a more extensive study on the follow-up details of similar cases in the literature. In our study, we determined that rate of entubated patients and mortality rate was very high in post-operative period (37.6% and 47.5%, respectively). Moreover, duration of stay in hospital of the patients monitored with mechanical ventilation was shorter (3.27±1.01 days) than the patients who died (5.13±1.76 days); this finding is related to the clinical characteristics of the cases (multiple trauma, hemodynamic status, and ICU follow-up conditions). These results may be the most dramatic follow-up results regarding injured Syrian refugees reported in the literature to date. The fact that head, abdominal, and thoracic injuries were the most prominent among patients who died in the postoperative period in the ICU is important because this finding reveals the body

regions affected most extensively by gunshot, explosives, and shrapnel.

In a study by Hakimoglu et al. on 364 preoperative injured Syrian refugees, the mean ES amount was found to be 2.6±5.4 units, and the mean FFP amount was found to be 0.8±2.6 units. Moreover, the amount of products used for survivor perioperative cases was less for exitus cases.[11] In a systematic review study on penetrant-traumatic cases, Tapia et al. reported that when beginning of trauma centers mortality rates were high in the traumatic cases are not given optimal levels of liquid and blood products.[17] In our study, the mean ES amount used for emergency-operation cases was consistent with these results, the amount of FFP was higher. These findings are consistent with the results of our study. Among the emergency-operation cases we observed, the departments requiring the highest levels of blood product use included the General Surgery, Thoracic Surgery, CVS, and Orthopedics departments, and this finding may be related to the hemodynamic instability of the cases reporting for treatment in these departments. In our study, the amounts of blood product transfusions were optimal according to the principles of DCR practice.

The pH, hemoglobin, and core temperature values measured from the blood gases of exitus cases who died during and early after operation in the ED and consulted by the General Surgery, Thoracic Surgery, and Neurosurgery Departments were significantly lower than normal limits. The pH, hemoglobin, and core temperature values of exitus cases who died in the preoperative and intraoperative periods were lower than those of cases who died in the postoperative period, which may be related to long periods without any treatment after the trauma, clinical conditions upon admission to the ED, early intervention priority, and limited healthcare opportunities. In neurosurgical cases, the pH, hemoglobin, and core temperature values of cases who died in different periods were higher than those of patients who consulted and/or followed-up in the General Surgery and Thoracic Surgery departments. This finding indicates that lesions in the central nervous system directly affect vital centers and may lead to exitus without significantly influencing the parameters measured from blood gas.

The extent of trauma-induced coagulopathy (TIC), the endogen-based response of the body to any severe trauma, is proportional to the severity of the trauma. In TIC management, early diagnosis, fast transportation, hemorrhage control, and avoidance of crystalloid resuscitation are very important.[18] DCR refers to the plasma-rich and crystalloid-poor liquid resuscitation approach applied for shock developing from massive hemorrhages. The effect of DCR on hypoxia development after massive transfusion is not known.[1] In our study, the mortality of 204 cases followed-up in the ICU after DCS within the first 72 hours of admittance (28 cases, 13.7%) may be related to the high rate of complications such as ARDS, DIC, ATN, and sepsis among general surgical and thoracic surgical patients (30 cases, 14.7%).

In conclusion, all wars cause severe trauma in both the physical and emotional aspects. Most injured Syrian refugees suffering from the effects of civil war consisted of young males and children. Since ground attacks were more prominent in the first years of war than in later years, the most-cited reason for injury was firearms. Half of all traumatic cases taken to the ED of Kilis Public Hospital were treated as outpatients, and head–neck, thorax–abdomen–backplane, and multiple body injuries were the most frequently reported injuries among severely traumatic cases requiring emergency surgery. The NISS and ASA scores of these patients were relatively higher. Although the most frequent emergency surgery and DCS requirements were observed in orthopedic surgical cases requiring, the highest mortality rates were observed in neurosurgical cases. The mean hospitalization duration of survivor cases followed-up in the ICU after emergency surgery was shorter than that of non-survivors, and the amounts of blood products required by the former were lower than that of the latter. As well, the invasive measurement parameters (i.e., pH, hemoglobin, body temperature, and MABP) and INR values of survivors were better than those of intubated and exitus cases. According to this study, in severely traumatic cases under difficult war conditions, DCR and DCS should be preferred with appropriate indications.

Conflict of interest: None declared.

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ORİJİNAL ÇALIŞMA - *ÖZET*

Suriyeli mültecilerin süren iç savaş sırasındaki yaralanma özellikleri

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AMAÇ: Savaşlar sırasında çok sayıda sivil, sıklıkla yüksek kinetik enerjili ateşli silahlar, bomba ve şarapnel etkisiyle ciddi yaralanmalarla karşı karşıya kalmışlardır. Savaş yaralısı olguların triyajı, cerrahi prosedürleri ve yoğun bakım takipleri oldukça zor ve karmaşık süreçleri içerir. Biz bu çalışmada, Suriye İç Savaşı sırasında yaralanan ve acil operasyon gerektiren olguların demografik ve travmatik özelliklerini inceledik.

GEREÇ VE YÖNTEM: Türkiye'nin güneyindeki Suriye sınırından Mart 2012 ve Ocak 2013 arasında Kilis Devlet Hastanesi'ne getirilen 8318 Suriyeli yaralı sığınmacı arasından acil olarak operasyona alınan 707 olgunun travmatik, cerrahi ve yoğun bakım takip özellikleri, elektronik datalar üzerinden geriye dönük olarak incelendi.

BULGULAR: Olgulardaki en sık yaralanma nedeni yüksek kinetik enerjili ateşli silahlar (%83.75) idi. Acil servisten direkt olarak operasyon odasına alınan 707 olgunun %93.2'si erkek cinsiyetinde yaş ortalaması 26.1±12.1 ve çocuk olguların yaş ortalaması ise 11.7±3.41 olarak saptandı. En sık yaralanan vücut bölgesi baş-boyun idi (%52.7). New Injury Severity Score (NISS): 42.5±11.2 ve American Society of Anesthesiologists (ASA) Score: 3.2±0.7 olarak bulundu. Ameliyatta hayatını kaybeden olgu sayısı yedi, hasar kontrol cerrahisi uygulanan olgu sayısı 204 ve ameliyat sonrası periyotta yoğun bakıma yatırılan olgu sayısı ise 233 olarak bulundu.Yoğun bakımda yatış süresi 4.67±1.32 idi.Yaşayan hastalarda ilk 24 saatte bakılan invaziv ölçümler (pH, hemoglobin, vücut ısısı, ortalama arteriyal kan basıncı) ve International Normalized Ratio (INR) daha yüksek bulundu. Yaşayabilen hastalar için kullanılan kan ürünü miktarları daha azdı ve bu hastalarda NISS 29.7±10.1 olarak bulundu. Acil operasyon sonrası yoğun bakımda takip edilen tüm hastalardaki mortalite oranı %45 ve en düşük sağ kalım oranı nöroşirürji olgularına aitti (%24.1).

TARTIŞMA: Bu çalışmanın verileri, Suriye İç Savaşı sırasında tahrip gücü yüksek olan savaş silahları ile yaralanarak Türkiye'ye getirilen ve acil operasyona alınan Suriyeli sivillerde baş-boyun, göğüs-abdomen ve çoklu vücut yaralanmalarının sık görüldüğüne, acil cerrahi operasyon sayılarının fazla ve yoğun bakım takip sürelerinin uzun olduğuna, mortal olgularda ise NISS ve ASA skorlarının anlamlı bir şekilde yüksek olduğuna işaret etmektedir.

Anahtar sözcükler: Yaralanma özellikleri; mülteciler; Suriye iç savaşı.

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