Abstract

**Background**: As a result of the Syrian civil war, > 5 million Syrian citizens have fled to neighbouring countries, particularly Turkey, under refugee status.

**Aims**: To analyse the cost and justification for surgery of Syrian refugees treated in a secondary care hospital in Sanliurfa, Southeastern Turkey, close to the Syrian border.

**Methods**: We enrolled 1458 Syrian refugees who were operated upon between 2012 and 2015. The data were obtained through a retrospective search of the hospital information system. Patients were divided into traumatic and nontraumatic cases. Injured body regions, anaesthetic technique, duration of operation, length of hospital stay, sociodemographic features and treatment cost were recorded and analysed.

**Results**: Length of the hospital stay was 7.66 (0.31) days for all 1458 patients. The most common operations were orthopaedic, urological and cranial surgery. The total healthcare costs while patients stayed in hospital was ~US$ 2 million, and cost per patient was US$ 1400.

**Conclusions**: The number of trauma operations performed has declined between 2012 and 2015. Health spending on refugees is an indicator of the economic burden on the country.
Keywords: civil war, health cost, length of stay, Syrian refugees, surgery

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Introduction

Approximately 21 million people were living in the Syrian Arab Republic before the start of the civil war in March 2011. The fighting spread throughout the country and forced > 5 million people to flee the country. Turkey has become the country with the highest number (almost two thirds) of Syrian refugees (1). As of 29 May 2017, 246 636 Syrian refugees were hosted in 22 camps that were built by the Turkish Ministry of Interior Disaster and Emergency Management Authority in 10 provinces in the South and Southeastern regions of Anatolia, while 2 774 018 were out-of-camp refugees (2).

Health care and education services are provided free of charge to the Syrian refugees that reside across Turkey. As of 18 August 2017, 28 685 499 examinations had been carried out on Syrian refugees, 1 231 840 patients had been hospitalized, 1 034 073 patients operated upon, and 248 462 babies delivered in Turkish healthcare facilities between 2011 and 2017 (1).

In this study, we retrospectively analysed the demographics, clinical features and healthcare costs of the Syrian refugees, who underwent elective or emergency surgery in a hospital in Sanliurfa, Turkey. Sanliurfa is a province located in Southeastern Anatolia, Turkey close to the Syrian border, which has the highest number of refugees hosted in camps and second-highest
Methods
Patients

We collected data regarding Syrian refugees who had been hospitalized and operated upon in a secondary care hospital with 208 inpatient and 25 intensive care beds. Data were analysed with permission of the hospital authority, and the ethical principles of the Declaration of Helsinki were followed for this study. A computerized search of the hospital information system database between 2012 and 2015 identified 1586 patients who underwent a surgical procedure. We excluded 128 from the analysis due to missing data. No data were obtained regarding gynaecology and obstetrics. In trauma patients, the cause was additionally noted if it was a firearms injury (FAI). The term open surgery referred to both gross surgery and open microsurgery.

Statistical analysis

Statistical analysis was conducted using SPSS version 20.0 (IBM, Armonk, NY, USA). For group comparison, $\chi^2$ or Fischer's test was used. Data are presented as mean ± standard error of the mean (95% confidence interval), and P

Results

The numbers of patients operated upon between 2012 and 2015 are shown in Table 1. Among the 1458 patients, 990 (67.9%) underwent elective surgery for nontraumatic reasons, and 468 patients (32.1%) for trauma, 144 of whom had an FAI (Table 2). The mean age of the patients was 33.78 (standard deviation, 0.56) years (range 32.67–34.88 years), and there were 313 patients (21.5%) under the age of 18 years. There were significantly more male patients (P Table 2).

The mean duration of the operation was 66.85 (1.43) minutes (95% CI 64.03–69.67 minutes). For the nontrauma and trauma patients, it was 51.70 (1.36) minutes (95% CI 49.02–54.37 minutes) and 98.90 (2.91) minutes (95% CI 93.17–104.64 minutes), respectively, which was a significant difference (P Table 3).

The mean length of the hospital stay was 7.66 (0.31) days (95% CI 7.04–8.27 days). For the nontrauma and trauma patients, it was 5.26 (0.29) days (95% CI 4.69–5.83 days) and 12.73
(0.70) days (95% CI 11.33–14.12 days), respectively, which was a significant difference (P Discussion

The length of hospital stay was 7.66 (0.31) days for Syrian refugees treated in a secondary care hospital in Sanliurfa, Southeastern Turkey, close to the Syrian border. The most common operations were orthopaedic, urological and cranial surgery. The total healthcare costs while patients stayed in hospital were ~US$ 2 million, and cost per patient was US$ 1400.

War can have direct and indirect effects on health. Injury, disability and death constitute the direct effects, and ecological destruction, worsening of living and nutritional conditions, increased numbers of diseases, and worsening of health care delivery comprise the indirect effects. Direct effects mostly affect men, whereas indirect effects also affect children, women and older people (3). As a result of direct and indirect effects of war, health care for refugees is conducted mainly by emergency services, surgical specialty facilities, and intensive care units (3). In this study, we analysed the relevant data from a state hospital on the Turkish–Syrian border that accepts a high number of Syrian refugees. Our analysis showed that a large number of patients received inpatient treatment, including surgical procedures for traumatic injuries, as well as various health problems other than trauma.

In several studies conducted in Turkey regarding Syrian patients, between 88.8% and 90.8% of patients were male (4,5). In the present study, we found this ratio to be 74.8%. In our opinion, this lower ratio of male patients may be a consequence of the larger number of patients included in the present study and of the longer duration of the study. Also, unlike the other studies that included trauma patients only, we included both trauma and nontrauma patients who underwent surgery.

In the study of Hornez et al., the mean age of the patients was 27 years (6), while Celikel et al. found that the mean age of the male and female patients was 31.8 (14.6) and 18.2 (17.3) years, respectively (7). In our study, the mean age of the male and female patients was 31.73 (0.63) and 39.71 (1.15) years, respectively. The higher mean age in our study may have been because of the elective patients.

Most of the surgery performed as a direct consequence of war is because of multiple organ injuries. When evaluated on an organ–system basis, the most common cause is extremity injuries (6,8,9). These agree with our study, in which most of the surgery (59.6%) was performed for extremity injuries. When we evaluated the FAI group of patients, intestinal injuries
were the most common reason for surgery. To our knowledge, the reasons for surgery in patients with FAI have not been published before. When compared to traumatic patients who underwent elective surgery, the length of hospital stay and duration of operation were longer for patients with FAIs. Ozdogan et al. reported that the average length of hospital stay was 12 days for FAI patients (10), which is similar to our result. We think that the accompanying multiple organ injuries in patients who sustained FAIs may have been the cause for longer hospital stay. We found that the percentage of patients who required surgery for trauma and FAIs declined between 2012 and 2015. The number of Syrians who have left the country has increased since the beginning of the war, and the chaotic environment has been replaced by a relatively steady state. We think that this may be the cause of the observed decline in trauma surgery.

Health service expenditure on these groups of patients cannot be determined accurately. To date, Turkey has donated US$ 7.6 billion for humanitarian aid for Syrian refugees. The international community has also donated US$ 418 million for Syrian refugees who are living in Turkey (11). In our study, cost per patient was US$ 1400, whereas between 2012 and 2014 the cost per patient in intensive care was US$ 1280 (10).

Conclusion

Our study showed that men are more commonly affected than women by war injuries. Hospitalization and duration of surgery were longer in traumatic patients, and the extremities were the most commonly affected region. Civil war affects the economy and workforce in neighbouring countries as well as the country in which the war is ongoing. We believe that our results could be used to predict outcomes in patients with war injuries, and could be beneficial to predict the injury patterns and elective surgical indications in refugees.

References


