

Distribution and cost of Syrian refugees operated on in Southeastern Anatolia, Turkey

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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).

Healthcare 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 number of out-of-camp refugees (2).

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, χ^2 or Fischer's test was used. Data are presented as mean \pm standard error of the mean (95% confidence interval), and $P < 0.05$ was considered statistically significant.

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 ($P < 0.05$). Mean age of the male patients was 31.73 (0.63) years [95% confidence interval (CI) 30.49–32.97 years] compared with 39.71 (1.15) years (95% CI 37.44–41.99 years) of the female patients. The mean age of the non-trauma patients [36.96 (0.74), 95% CI 35.50–38.43 years] was significantly older than that of the trauma patients [27.04 (0.66), 95% CI 25.74–28.34 years] ($P < 0.05$). Furthermore, the mean age of the trauma patients who had been operated upon for an FAI was 26.20 (1.07) years (95% CI 24.08–28.33 years), which was significantly lower than in the nontraumatic patients ($P < 0.05$). Body region of injury, type of operation and method of anaesthesia are shown in 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 ($P < 0.05$). The duration was 112.21 (5.06) minutes (95% CI 102.19–122.23 minutes) for the patients with an FAI, which was significantly higher than for the nontrauma patients ($P < 0.05$). The types of surgical procedures performed on the trauma patients are presented in 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 ($P < 0.05$). The length of stay for patients with an FAI was 14.54 (1.38) days (95% CI 11.80–17.28 days), which was significantly longer than for nontrauma patients ($P < 0.05$).

The total direct healthcare costs, including medication, diagnostic tests, surgery, and hospitalization, was US\$ 2 000 000 (US\$ 1400 per patient).

Table 1 Number of operations performed on Syrian refugees in Turkey

Year	Total no. of surgical patients (n = 1458)	No. of patients operated upon due to acute trauma	
	(n)	(n)	%
2012	89	58	65.2
2013	405	200	49.4
2014	682	172	25.2
2015	282	38	13.5

Table 2 Demographic and clinical characteristics of surgical patients

Patient characteristics	(n)	%
Sex		
Female	374	25.7
Male	1084	74.3
Acute trauma		
Present	468	32.1
Absent	990	67.9
FAI		
Present	144	30.8
Absent	324	69.2
Injured body region		
Extremity	279	59.6
Abdomen	58	12.4
Head and neck	55	11.8
Thorax	40	8.5
Multiple body regions	21	4.5
Vertebrae	15	3.2
Operation		
Open surgery	1167	80
Microsurgery	186	12.8
Laparoscopic	17	1.2
Endoscopic	76	5.2
Arthroscopic	12	0.8
Anaesthetic method		
General	664	45.5
Local	379	26
Spinal	366	25.1
Sedation	20	1.4
RIVA	26	1.8
Epidural	2	0.1

RIVA = regional intravenous anaesthesia.

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 healthcare 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

Table 3 Characteristics of the operations performed

Operation characteristics	Operated body region in trauma patients		Operated body regions in FAI patients	
	(n)	%	(n)	%
Surgery of large bones	194	41.5	38	26.4
Intestinal surgery	38	8.1	27	18.8
Multiple trauma surgery	25	5.3	9	11.8
Cranial surgery	74	15.8	16	11.1
Urological surgery	188	12.9	9	6.2
Soft tissue surgery	150	10.3	7	4.9
Vascular surgery	8	1.7	7	4.9
Tube thoracostomy	14	3	5	3.5
Vertebral surgery	11	2.4	5	3.5
Diaphragm surgery	6	1.3	5	3.5
Pulmonary surgery	19	4.1	3	2.1
Joint surgery	8	1.7	3	2.1
Surgery of small to medium- sized bones	15	3.2	2	1.4
Ear nose throat surgery	2	0.4	0	0

FAI = firearm injury.

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.

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Competing interests: None declared.

Répartition des réfugiés syriens et coût associé dans le sud-est de l'Anatolie (Turquie)

Résumé

Contexte : À la suite de la guerre civile syrienne, plus de cinq millions de citoyens syriens ont fui vers les pays voisins, en particulier la Turquie, avec le statut de réfugiés.

Objectifs : Analyser le coût et la justification de la prise en charge chirurgicale des réfugiés syriens dans un hôpital de soins secondaires à Sanliurfa, dans le sud-est de la Turquie, près de la frontière syrienne.

Méthodes : Nous avons inscrit dans cette étude 1458 réfugiés syriens ayant subi une intervention chirurgicale entre 2012 et 2015. Les données ont été obtenues par une recherche rétrospective dans le système d'information hospitalier. Les patients ont été répartis en deux catégories : cas traumatiques et non traumatiques. Les zones du corps concernées, la technique d'anesthésie, la durée de l'opération, le nombre de jours d'hospitalisation, les caractéristiques sociodémographiques et le coût du traitement ont été enregistrés et analysés.

Résultats : La durée d'hospitalisation était de 7,66 (0,31) jours pour les 1458 patients. Les opérations les plus courantes relevaient de la chirurgie orthopédique, urologique et crânienne. Le coût total des soins de santé pendant le séjour des patients à l'hôpital était d'environ deux millions de dollars des États-Unis (US), et le coût par patient était de 1400 dollars US.

Conclusions : Le nombre d'actes de chirurgie traumatologique réalisés a diminué entre 2012 et 2015. Les dépenses de santé consacrées aux réfugiés sont un indicateur du poids économique qui pèse sur le pays.

توزيع اللاجئين السوريين الذين خضعوا لعمليات جراحية في جنوب شرق الأناضول بتركيا وتكلفة إجراء الجراحة

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الخلاصة

الخلفية: دفعت الحرب الأهلية السورية أكثر من 5 ملايين مواطن سوري إلى الفرار إلى البلدان المجاورة، ولا سيما تركيا، باعتبارهم لاجئين.

الأهداف: هدفت هذه الدراسة إلى تحليل تكلفة العمليات الجراحية للاجئين السوريين الذين عُولجوا في مستشفى للرعاية الثانوية في مدينة سان ليورفا، جنوب شرق تركيا، بالقرب من الحدود السورية، ومبررات تلك العمليات الجراحية.

طرق البحث: ضُمَّت الدراسة 1458 لاجئاً سورياً خضعوا لعمليات جراحية بين عامي 2012 و2015. وتم الحصول على البيانات من خلال البحث بأثر رجعي في نظام معلومات المستشفيات. وصُنِّف المرضى إلى حالات مرتبطة بإصابات شديدة وحالات غير مرتبطة بإصابات شديدة. وتم تسجيل وتحليل المناطق المصابة بالجسم، وطريقة التخدير، ومدة العملية الجراحية، ومدة الإقامة في المستشفى، والسمات الاجتماعية السكانية، وتكلفة العلاج.

النتائج: بلغت مدة الإقامة في المستشفى 7.66 (0.31) يوماً لجميع المرضى البالغ عددهم 1458 مريضاً. وشملت العمليات الأكثر شيوعاً جراحة العظام والمسالك البولية والجراحة القحفية. وبلغت التكلفة الإجمالية للرعاية الصحية أثناء مكوث المرضى في المستشفى نحو 2 مليون دولار أمريكي، وبلغت التكلفة لكل مريض 1400 دولار أمريكي.

الاستنتاجات: انخفض عدد العمليات الجراحية التي أُجريت لعلاج الإصابات الشديدة بين عامي 2012 و2015. ويُعد الإنفاق الصحي على اللاجئين مؤشراً على العبء الاقتصادي الملحق على كاهل البلد.

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