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Original Contribution

Retrospective analysis of forensic cases in refugees admitted to emergency department

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ABSTRACT

Introduction: The aim of this study was to compare the distribution and frequency of forensic medical events in a refugee group with that of the general population, and thus, extrapolate the problems encountered in the immigrant population.
Methods: Those cases admitted to the emergency department (ED) for any reason that required a forensic examination between January 2016 and June 2018 were investigated retrospectively.
Results: A total of 310 refugees were admitted to the ED for forensic medical events. The most common nations of origin of the refugees were Iraq (n = 167), Syria (n = 65), and Afghanistan (n = 28). The median age of the refugees was 24 years old (interquartile range = 17–33). With regard to forensics, the most common reasons for the refugees to present to the ED were motor vehicle accidents 27.4%, assaults 25.8%, employment and industrial accidents 16.1%, and suicide attempts 10.3%. Other than suicide attempts, all of the forensic presentations were more common in the males. The outcomes of the refugee group were as follows: 92.3% were discharged, 5.8% were admitted to the hospital, 1% were admitted to the intensive care unit (ICU), and 1% were transferred. Suicide attempts were the most common reasons for the ICU admissions, while the most common reasons for the hospital admissions were orthopedic injuries.
Conclusion: In general, the forensic event frequency in the refugee group was lower (p = 0.001); however, this was a single center study, and there could have been unrecorded cases due to an inability to access healthcare assistance, so these results may not be reliable.

1. Introduction

Persecution and violent conflicts all over the world have forced the displacement of >40 million people [1]. Specifically, the ongoing civil war taking place in the Middle East has caused a significant increase in the number of refugees from that region [2]. According to data from the United Nations, Turkey, with >3.5 million refugees, is the top refugee-hosting country in the world [3].

It is well-known that physical, mental, and social health disorders are associated with migration [4]. Therefore, our hypothesis was that the frequency of forensic events would be higher in refugees. The aim of this study was to compare the distribution and frequency of forensic medical events in a refugee group with that of the general population, and thus, extrapolate the problems encountered in the immigrant population in general.

2. Materials and methods

This study was carried out with the approval of the Health Application Research Center of Keçiören Training and Research Hospital. Those patient files with forensic examination records in the hospital data registration system between January 2016 and June 2018 were investigated retrospectively. All of the cases admitted to the adult emergency department (ED) for any reason that required a forensic examination were included in this research. Those cases with missing data were excluded. The patients were categorized according to their demographic findings, nationalities, forensic complaints upon admission, and ED outcomes.

2.1. Statistical analysis

The statistical analysis was performed using the Statistical Package for the Social Sciences version 15.0 (SPSS Inc., Chicago, IL, USA). The variables were investigated using visual methods (histogram) and analytical methods (Kolmogorov-Smirnov test) to determine whether or not they were normally distributed. The descriptive analyses were presented using frequency tables for the ordinal variables and the median and interquartile range (IQR) for the non-normally distributed

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variables. Since the patients' ages were not normally distributed, the Mann-Whitney *U* test was used to compare the ages and nationalities between the groups. Additionally, the categorical variables were analyzed using the Pearson chi-squared test. A p-value of <0.05 was considered to be statistically significant.

3. Results

A total of 15,529 forensic medical cases were included in this study. Of those patients, 15,219 (98%) were Turkish citizens, which left a refugee group of 310 patients. The three most common nationalities of the refugees were Iraqi (n = 167), Syrian (n = 65), and Afghanistani (n = 28). In the Turkish citizen group, there were 5647 (37.1%) females and 9572 (62.9%) males. In the refugee group, there were 120 (38.7%) females and 190 (61.3%) males. Thus, the gender distributions were similar between the groups. Moreover, the median age was 29 years old (IQR = 20–40) for the Turkish citizen group and 24 years old (IQR = 17–33) for the refugee group. There was a significant difference between the median ages of the groups ($p < 0.001$).

Gunshot wounds, suicide attempts, assaults, motor vehicle accidents, falling from heights, intoxications, drug abuse, burnings, animal bites, penetrating traumas, electrical shocks, and employment and industrial accidents were all considered to be reasons for a forensic medical examination. For the Turkish citizens, the most common forensic reasons for presentation were assaults (n = 4987, 32.8%), motor vehicle accidents (n = 4284, 28.1%), employment/industrial accidents (n = 2532, 16.6%), and suicide attempts (n = 1247, 8.2%). For the refugee group, the most common forensic presentations were motor vehicle accidents (n = 85, 27.4%), followed by assaults (n = 80, 25.8%), employment/industrial accidents (n = 50, 16.1%), and suicide attempts (n = 32, 10.3%). The number of assaults was significantly higher in the Turkısh citizen group ($p = 0.009$); however, the suicide attempt, motor vehicle accident, and employment/industrial accident frequencies were similar between the groups ($p > 0.05$). For the other subgroups, the only significant difference was in the carbon monoxide (CO) poisonings; the number of cases in the Turkish citizen group was 318 (2.1%), and that in the refugee group was 14 (4.5%) ($p = 0.003$) (Table 1).

For the forensic events, the number of males in both groups was greater than the number of females. For the Turkish citizen group, the F/M ratios were: assaults = 1922/3065, motor vehicle accidents = 1740/2544, employment/industrial accidents = 382/2150, and others = 694/1475, respectively. For the refugee group, the F/M ratios were: assaults = 31/49, motor vehicle accidents = 39/46, employment/industrial accidents = 0/50, and others = 25/38, respectively. The only exception was in the suicide attempts, for which the F/M ratios were 909/338 for the Turkısh citizen group and 25/7 for the refugee group, respectively. The gender distributions of the subgroups were similar, except for the employment/industrial accidents, in which there were no females in the refugee group (Table 2).

Table 1
Baseline characteristics of patients – median (IQR 25–75%) or n (%).

	Turkish citizens (n = 15,219)	Refugees (n = 310)
Gender		
Female	5647 (37.1)	120 (38.7)
Male	9572 (62.9)	190 (61.3%)
Age	29 (20–40)	24 (17–33)
Reason for presentation		
Assault	4987 (32.8)	80 (25.8)
Motor vehicle accidents	4284 (28.1)	85 (27.4)
Employment-industrial accidents	2532 (16.6)	50 (16.1)
Suicide attempt	1247 (8.2)	32 (10.3)
Others	2147 (14.1)	63 (20.3)
CO intoxication	318 (2.1%)	14 (4.5%)
Outcome at E.D.		
Discharged at E.D.	14,600 (95.6)	286 (92.3)
Hospital admission	447 (2.9)	18 (5.8)
Intensive care unit admission	53 (0.3)	3 (1)
Transferred to other centers	119 (0.8)	3 (1)
Death at E.D.	22	0

Table 2
Gender distributions of forensic medical events in groups – n.

	Turkish citizens (n = 15,219)		Refugees (n = 310)	
	Female	Male	Female	Male
Type of forensic medical event				
Assault	1922	3065	31	49
Motor vehicle accidents	1740	2544	39	46
Employment-industrial accidents	382	2150	0	50
Suicide attempt	**909**	**338**	**25**	**7**
Others	689	1458	25	38

The ED outcomes of the Turkısh citizen group were 14,600 (95.6%) discharged, 447 (2.9%) admitted to the hospital, 53 (0.3%) admitted to the ICU, 119 (0.8%) transferred to other centers, and 22 (0.001%) patients died in the ED. The refugee group ED outcomes were 286 (92.3%) discharged, 18 (5.8%) admitted to the hospital, 3 (1%) admitted to the ICU, and 3 (1%) transferred to other centers. The discharge ratio was significantly lower and the hospital admission ratio was significantly higher in the refugee group ($p = 0.001$ and $p = 0.003$, respectively).

The most common reasons for the ICU admissions were suicide attempts, and the most common reasons for the hospital admissions were orthopedic injuries.

4. Discussion

Based on the recorded data, the population of Ankara is 5,445,000, and the number of refugees living in Ankara is 130,000 [5,6]. According to this data and our study results, the frequency of forensic medical events in the refugee group was significantly lower than that in the Turkish citizen group ($p = 0.001$).

The median age of the refugee group was 24 years old, and similar age averages were observed in other studies related to refugees [4,7]. This can be interpreted as a greater tendency toward the young population migrating than the elderly population.

Carmen et al. reported that more than one-third of the applications of asylum seekers are submitted due to trauma as a consequence of violence [1]. However, our study showed that the number of assaults was higher in the Turkish citizen group. One reason for the lower assault ratio in the refugee group could be that they did not seek help when they were involved in crimes or conflicts because of the social repercussions that they may have had to face.

The incidence of psychiatric problems is quite high among asylum seekers, and there have been studies that reported high incidences of suicide and self-harm in this group [8,9]. There are many reasons for this, such as experiencing severe trauma (like torture), as a consequence of the asylum process itself, or the stress of settling into a new culture [1]. However, in our study, there was no difference between the two groups in terms of the number of suicide attempts. One possible reason why we did not detect a difference could be because some of the refugees may not have received medical help for unsuccessful suicide attempts, and therefore, they were not recorded. Moreover, in contrast to the other forensic events, the number of female suicide cases was higher. This is not surprising, because most studies have shown that although unsuccessful suicide attempts are higher among females, the actual number of (successful) suicides is higher in males [10].

There were no female refugees presenting with employment/industrial accidents in our study. Both language and legal problems are important reasons why refugees not to practice their own professions. There are also negative stereotypes based on gender. Moreover, domestic violence, sexual exploitation, and early marriage are some forms of

violence against women that force them to stay out of the workplace [11].

Another unsurprising result was related CO poisoning, which occurred twice as often in the refugee group. Refugees generally live in crowded and unsanitary conditions, which are predisposing factors for this kind of preventable health problem [4].

More than ninety percent of the patients were treated as outpatients in both groups. Based on this information, it is assumed that their health problems when they presented to the ED were not very serious. However, in one previous study, more than one-half of the surgical presentations in the refugee group were due to trauma-related problems [1]. We had similar results, which showed that the most common reasons for the hospital admissions were orthopedic injuries.

4.1. Limitations

This study did have several limitations, so the conclusions must be interpreted carefully. First, it was a single center study; therefore, external validity cannot be determined. Additionally, it is unlikely that the number of registered refugees reflected reality, and when combined with the problems that refugees have in reaching healthcare assistance, this data may not be accurate. Although we knew the forensic event types, we could not obtain the detailed examination findings of the cases. Therefore, we could not make clear judgements about the severity of the cases and the types of injuries.

5. Conclusions

Our study is the first to present data on the frequency of forensic medical events in refugees. The most common forensic events were motor vehicle accidents, assaults, employment/industrial accidents, and suicides; however, the results were similar to those of the local population (Turkish citizens). Moreover, with the exception of suicide attempts, all of the forensic events occurred more commonly in the males.

In general, the frequency of forensic events in the refugee group seemed to be lower, but when considering that this was a single-center study, and that likely there were unrecorded cases due an inability to access healthcare assistance, these results may not be reliable. Therefore, more multicenter and comprehensive studies are needed.

Conflicts of interest and funding

None to declare.

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