

Surgical Emergency Room Workload Characteristics: Single Center Experience during One Year

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Abstract

Background: Having information on characteristics of work load of emergency surgical room in 3 working-shifts per day help to manage facilities and health care providers more efficiently. The aim of this study is to evaluate the workload pattern of 3 working-shifts of a day in Nemazee Hospital, southern Iran.

Methods: The patients who were admitted in the surgical Emergency Room from April 2007 to May 2008 were enrolled including the patients' demographics, referral sources, the busiest working-shifts and the type of procedures performed in the Emergency Room.

Results: 33,837 emergency surgery referrals were recorded, of which 74.7% were male and 25.3% were female with a mean age of 30.8±20.1 years. The busiest working-shift of the day was between 8.00 PM and 8.00 AM, when 48.4% patients were admitted. 12.1% were admitted in the Emergency Room while 4.8% patients were admitted in the hospital wards and 5.6% underwent emergency surgery. 32.4% of them were discharged while 39.7% left the hospital with their own responsibility and 4.7% patients escaped from the hospital. The total number of the deaths during the study period was 0.7%.

Conclusion: Our results showed that patients were mainly male teenagers and most of the accidents happened by motorbike during the busiest working-shift of the day from 8 PM to 8 AM. Therefore, it would be useful to persuade health system administrators to set up some educational programs to increase the awareness of families and teenagers regarding trauma and also to allocate more resources to shorten waiting lists.

Keywords: Emergency room; Surgical workload; Fars province; Iran; Release

Introduction

Emergency surgical admissions account for 46% to 57% of all surgical admissions,¹⁻³ but the workload estimates are difficult to achieve because of the unpredictability and variability of such admissions. There are no contemporaneous studies concerning the nature and volume of emergency surgical admissions. The impact of the emergency surgical workload on surgical practice is not only determined by overall volume but also by patient demographics, appropri-

ateness of referral, centralization, diagnoses, and required surgical operations.⁴ The changing patterns have implications for surgical training, workforce planning and service provision.²

Fars Province in south of Iran covers 122,483 sq km with a population of 4,336,878 having different socio-cultural backgrounds, living in climatic extremes, with urban life in big cities, rural life in deserts and nomadic life in mountains, ranges and valleys. Healthcare is provided at government polyclinics and public hospitals.

Nemazee Hospital is a general teaching one located in Shiraz, Fars Province, southern Iran. It is a tertiary referral center from all parts of Fars Province. In this hospital, Bolanparvaz et al. studied 459 cases of CPR and showed that the 1st hr survival rate was 10.6%.^{5,6}

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This study aimed to identify the current patterns and common problems related to surgical Emergency Room (ER) admissions from Nemazee Hospital. As this center is the first biggest center delivering trauma care in southern Iran, identification of a high risk group for trauma is useful for prevention purposes. We evaluate the workload patterns of three working-shifts of the day in Nemazee Hospital. According to these data, we can manage the medical personnel and equipment in the three different working-shifts of the day, including 8 AM to 2 PM, 2 PM to 8 PM, and 8 PM to 8 AM.

Materials and Methods

All surgical ER admissions over 13 months from April 2007 to May 2008 were recorded retrospectively. Orthopedic trauma only (not multiple trauma) and urological admissions were excluded since they were managed by Orthopedics and Urology departments, respectively; patients referred internally (already in-patient for another medical condition) from other specialties were also excluded since they did not affect the surgical department's bed occupancy rates. Information was obtained from hand-over list. All the data were anonymized. Statistical analysis was performed on SPSS for Windows (Version 15.0, Chicago, IL, USA) and the data are expressed as mean \pm SD.

Results

33837 emergency surgery referrals were recorded, of which 25300 (74.7%) were male and 8537 (25.3%) were female. The mean age of the patients was 30.8 \pm 20.1 years with the median of 25 years (range=0.5–91 years). The busiest working-shift of the day for admissions was between 8 PM to 8 AM, during which 16387 (48.4%) patients were admitted. In the same way, the least busy working-shift of the day was between 8.00 AM and 2.00 PM with 7778 (23%) total admissions. The busiest month for admissions was May 2007 with 95.3 admissions per day followed by May 2008 (93.2 admissions per day), September 2007 (89.8 admissions per day) and March 2008 (89.5 admissions per day) (Table 1).

Most of the patients (75.6%) were referred from the Screen Department of the hospital while those referred by ambulances comprised only 4.6% of the

total referrals. Motor accidents accounted for 49.1% of the admissions. 4087 (12.1%) of the patients were admitted in the ER while 1609 (4.8%) were admitted in the hospital wards and 1899 (5.6%) underwent emergency surgery. 10954 (32.4%) patients were discharged from the ER while 13435 (39.7%) left the hospital with their own responsibility and 1604 (4.7%) patients escaped the hospital. The total number of the deaths during the study period was 249 (0.7%). Chest tube was placed for 424 (1.3%) of the patients and 796 (2.4%) patients underwent orotracheal intubation. Extremity slabs were performed for 1464 (4.3%) patients and suturing for 5104 (15%) patients.

Table 1: Characteristics of surgical emergency room workload during 1 year

Characteristics	Number (%)
Total admissions	33837
Male	25300 (74.7)
Female	8537 (25.3)
Mean age	30.8 \pm 20.1
8 AM–2 PM	7778 (23)
2 PM–8 PM	9672 (28.6)
8 PM–8 AM	16387 (48.4)
Referred from screen	25580 (75.6)
Referred by ambulance	1556 (4.6)
Referred from countryside	3069 (9.1)
Patient's referral by himself	3632 (10.7)
Motor accidents	16613 (49.1)

Discussion

The results of the present epidemiological study show the male predominance of patients referred to ER, indicating that sex strongly influences the risk of injury in this period. This result is in agreement with several reports from other populations.^{2,7} The busiest time of the day was between 8 PM and 8 AM, which shows the higher level of surgical referrals during night. This finding can be due to more working hours (12 hours) in comparison to the two other working-shifts (6 hours). On the other hand, this reflects the higher rates of motor accidents and street strife during the night. However, Mai-phan *et al.* showed that the busiest time of the day was from 12 AM to 6 PM, which is contrary to our finding.⁵ It is logical that each center should have its own protocol to organize the emergency department and manage the trauma patients according to its available equipment and trained medical personnels.^{8,9}

May was the busiest time of the year for surgical

referrals. May is a month which is school and university holidays and the summer vacations start. As most of our patients (68.4%) were teenagers and youths, this can be concluded that the higher rate of admissions in this month is due to more free time of this age group resulting in more car accidents and street strife.

Motor accidents accounted for 49.1% of the referrals which reflects the high rate of such accidents in our community. From all the referred patients, 13435 (39.7%) left the hospital with their own responsibility after their condition became stable and 1604 (4.7%) patients escaped from the hospital. Peyravi *et al.* showed that there was a considerable decrease in referring patients to the hospital in motorlance missions, probably due to the right performance of the dispatch operators, and also the significant decreased arrival time in motorlance missions.¹⁰

Nemazee Hospital is the largest governmental educational center in the southern Iran. Most of the patients from different parts of Southern Iran are referred to this center. This results in the heavy workload of emergency room of this hospital. In this center, health care is provided by residents, interns and medical students. Heavy workload accompanied by insufficient resources and personnel have resulted in patients' dissatisfaction. This high rate of transfer to other centers by patients' own responsibility (39.7%) is due to the long waiting lists in this hospital. Heavy workload in Nemazee Hospital resulted in the long waiting lists and thus many patients are transferred to other centers for early interpretations and procedures. All these patients were stabilized regarding hemodynamic condition. Rakei *et al.* demonstrated that 51%

of referred patients in this hospital suffered from cerebral aneurysm.¹¹

This study allows us to have some estimates on the dynamic nature of surgical emergency room workload, an aspect which is generally underestimated. Inevitably, a single centre data has limitations as to the generalizations which can be derived from them. So, more prospective and multicenteric studies are needed to describe the precise pattern of surgical workload in our department which can help us to improve the quality of our health care.

In conclusion, the results of this study showed that patients referred to ER were mainly male teenagers, the group that has more free time than other groups of people. Most of the accidents happened due to motor-bike accidents, which accounted for 49.1% of the admissions. Also, a high rate of patient's release which is an indicator of patients' dissatisfaction because of long waiting lists was observed.

Therefore, it would be useful to persuade health system administrators in the area to set up some educational programs to increase the awareness of families and teenager regarding trauma and also to allocate more resources to shorten waiting lists.

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Conflict of interest: None declared.

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