ORIGINAL ARTICLE

Reasons for unscheduled return visits within 72 hours to the adult emergency department in Riyadh

Majed H. Nasradeen[1] , Muhannad I. Althunayan[1], Alwaleed K. Aljamaan[1], Abdulrahman M. Aljehani[1], Fajr B. Alqahtani[2], Nawfal Aljerian[1,3,4,5]*, Mohammed Alhelail[5], Aamir Omair[6]

ABSTRACT

Background: Overcrowding in the emergency department (ED) seems to be a major barrier toward providing appropriate medical service and is associated with increasing in-hospital mortality. This study aimed to investigate unscheduled return visits to the ED within 72 hours, to identify the most common chief complaints/diagnoses, and to estimate the mortality rate within 1 month of that visit.

Methods: A cross-sectional retrospective study was conducted among patients above the age of 15 of both genders; Saudis and non-Saudis were included. The work was carried out at King Abdulaziz Medical City, Riyadh, from January to December 2017. The data were extracted from the BESTcare system, and there were 11,177 (6.1%) out of 182,602 visits to the ED which were unscheduled return visits. A computerized simple random sampling technique was used, and we enrolled a total of 375 revisits. The main variables were age, gender, chief complaints of the first and second visits, diagnoses of the first and second visits, comorbidities, admissions, and mortality rate within 1 month.

Results: The mean age was 43.6 ± 19.4 years (range: 15-94 years). There were slightly more females (53%) than males. There were 228 subjects (60.8%) who returned with the same complaint as their previous visit. Abdominal pain (24%) was the most common chief complaint in the first return visit, followed by cough (8%). Upper respiratory tract infection was the most frequent diagnosis for the first (10%) and second (9%) return visits. Hypertension (25%) and diabetes mellitus (21%) were the most common comorbidities. There were 62 (17%) patients admitted to the ED in the second visit. Most were admitted under internal medicine (34%), general surgery (21%), and obstetrics and gynecology (13%). The mortality rate within 1 month of discharge was 0.8%.

Conclusion: The incidental rate in our study is considered high and should be further explored by reassessing the admission and discharge policies. More attention and preventive treatment measures for common complaints may be needed to avoid ED return visits.

Keywords: Emergency department, return visit, 72 hours visit, unscheduled return visit.

Introduction

The emergency department (ED) provides 24 hours/day medical emergency services including evaluation, assessment, and management to those who are injured or in sudden acute illness [1]. Overcrowding in the ED seems to be a major barrier toward providing appropriate medical service and is associated with increasing in-hospital mortality [2,3]. ED return visit is defined as returning to the ED department within 72 hours of the last discharge. Its rate has been reported in the literature

as follows: Washington, DC, with 0.5% [4], Singapore with 2.93% [5], New York, USA, with 4.2% [6], and Taichung, Taiwan, with 5.47% [7]. In Saudi Arabia, a study showed that the number of ED visits at King Abdulaziz Medical City (KAMC), Riyadh, increased by 29.4% from 2003 to 2005 [8].

Return visits increase the burden on the department and staff in the ED [9]. Patients with 72-hours return visits have a significantly longer length of stay, which leads to additional pressure on the ED [9]. A study of tertiary care centers in Seoul reported that overcrowding is a major consequence of return visits that leads to an increase in the admission rate in patients returning to the ED [10]. Return visits could cause additional avoidable medical imaging and examinations that increase hospital costs. A study in Florida documented that the total cost of all return visits was more than the total cost of all the initial visits [11].

Regarding the causes behind the unscheduled return visits to the ED, many studies used different variables and showed various results. For instance, some studies only included patients with chronic diseases [12]. Another study included the ED return visit for more than 1 year [4]. Thus, the results are expected to vary between studies. One study in a 193-bed acute trauma center in Washington found that gastrointestinal problems were the most frequent of all complaints in unscheduled 72-hours return visits [13]. In addition, several studies have shown that abdominal problems or GI-related illnesses were the most common complaints associated with ED revisits [7,12]. In two separate studies, abdominal pain, fever, and vertigo/dizziness were the most common specific complaints [7,14].

A study in southern Taiwan measured the percentage of unscheduled return visits and classified the causes into four categories: doctor-based return visit, patient-based return visit, illness-based return visit, and healthcare-based return visit. The results showed that the most common reason was the illness-based causes (47.9%) [15]. Other studies reported the most common causes for revisits are illness-related rather than patient-related or healthcare-related [15,16].

In Saudi Arabia, a study of adults with chronic diseases identified the main reasons behind ED return visits in 2017-2018. These included circulatory conditions (19%) and genitourinary conditions (15.8%). They also found that other variables like advanced age (60 years or older), female gender, health insurance state, patients arriving to ED on a weekend, and new patients were associated with a high number of 72-hours return visits to the ED [12]. Targeting and identifying the factors behind a patient's return visits to the ED is an important step to determine the patients who needed more medical care and should not have been discharged. Identifying the unjustified return visits and avoiding them decreased overcrowding.

The aim of this study was to investigate unscheduled ED return visits within 72 hours at KAMC, Riyadh, Saudi Arabia. The main focus was to identify the most common illnesses/diagnoses and chief complaints related to unscheduled 72-hours return visits to the ED and to estimate the mortality rate within 1 month from that visit.

The study also aimed to assess factors associated with unscheduled return visits to the ED; the outcome for each patient depended on whether they were admitted or discharged.

Methods

This is a cross-sectional retrospective study conducted on patients who presented to the ED at KAMC Riyadh - the largest university hospital in Saudi Arabia.

A sample size of 375 was obtained from a population size of 11,177, with a response distribution of 50%, a 95% confidence level, and a margin of error of 5%. The study subjects were selected using a simple random sampling technique. Medical record numbers (MRNs) of patients with unscheduled return visits within 72 hours between January 2017 to December 2017 were gathered from the electronic medical record-integrated database (BESTCare 2.0 system) that is used in KAMC-RD; after that, they were listed on a random number generator. The chosen MRNs were reviewed by the research team. This study included patients older than 14 years of age who returned to the ED within 72 hours. Both genders and all nationalities (Saudi and non-Saudi) were included. The following variables were retrieved from the BESTCare database: age, gender, causes of ED initial visit, admissions, comorbidities, mortality, and time between visits. The primary outcomes of the study were the number of ED revisits within 72 hours, the diagnosis of the first and second visits, chief complaint of the first and second visits, and mortality rate within 1 month.

Data analysis

Data were entered and analyzed using Statistical Package for the Social Sciences v21. Descriptive statistics were presented as frequencies and percentages for the categorical variables and mean ± SD for the numerical variables. The categorical responses were compared using chi-square, e.g., gender and comorbidities. t-test and analysis of variance test were used to compare categorical and numerical data depending on the illness and age. All statistical tests were considered significant when p-value was < 0.05

Results

There were 182,602 ED visits between January 2017 and December 2017. Of these total visits, 11,177 (6.1%) had a return visit to the ED within 72 hours of the initial visit. A sample of 375 return visits was included in the study.

Table 1 illustrates the demographic data of the sample. The mean age of the sample was 43.6 ± 19.4 years with an age range between 15 and 94 years. There were slightly more females (53%, n = 200) than males. Among these return visits, the highest rate (51%, n = 192) returned to the ED within the first 24 hours.

Among those who revisited the ED within 3 days of the initial visit, 61% of them returned for the same complaint, 35% returned with a different complaint, and 4% were asked to return for follow-up. The most frequent chief complaints that the patients presented with in the initial visit were abdominal pain (19.2%), cough

(8%), and shortness of breath (SOB) (7.7; Table 2). The most common complaint that patients retuned with in the second visit were abdominal pain (23.7%), SOB (8.3%), cough (7.7%), and fever (7.7%) (Table 3). Figure 3 shows the comparison between the chief complaints of the initial visit and the return visit. The most common diagnosis for the initial ED visits among these patients were upper respiratory tract infection (10%), generalized pain (6%), abdominal pain (5%), and gastroenteritis (4%), as shown in Figure 1. The most common diagnosis for the return ED visits among these patients were upper respiratory tract infection (9%), spontaneous abortion (5%), and gastroenteritis (4%), as shown in Figure 2.

Figure 4 shows that the most common comorbidities among these patients were hypertension (25%), diabetes

mellitus type 2 (DM2) (21%), and the same percentage of dyslipidemia, asthma, and cardiac disease (9%). Among the 375 patients who revisited the ED, 17% were admitted to the ED wards in the second visit. Most of the patients were admitted under internal medicine (34%), followed

Table 1. *Demographics.*

	Mean + sd	Range
Age (years)	**43.6 + 19.4**	**(15-94)**
	Frequency	Percent
Gender		
Male	175	47
Female	200	53
Time between visits		
Within 24 hours	192	51
Within 48 hours	124	33
Within 72 hours	59	16

Table 2. *Chief complaints in the initial visit.*

Chief complaints in the initial visit	Frequency	Percent
Abdominal pain	72	19.2
Cough	30	8.0
SOB	29	7.7
Per Virginal (PV) bleeding	24	6.4
Fever	23	6.1
Chest pain	16	4.3
Vomiting	16	4.3
Back pain	15	4.0
Diarrhea	15	4.0
Headache	15	4.0

Table 3. *Chief complaints in the second visit.*

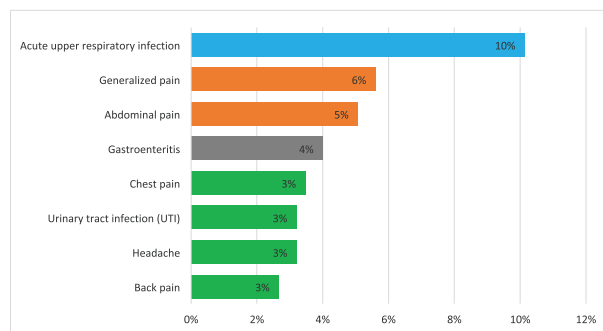| Chief complaints in the second visit	Frequency	Percent
Abdominal pain	89	23.7
SOB	31	8.3
Cough	29	7.7
Fever	29	7.7
PV bleeding	24	6.4
Sore throat	23	6.1
Vomiting	22	5.9
Chest pain	15	4.0
Back pain	14	3.7
Dizziness	11	2.9

Figure 1. *Diagnosis in the initial visit (n = 375).*
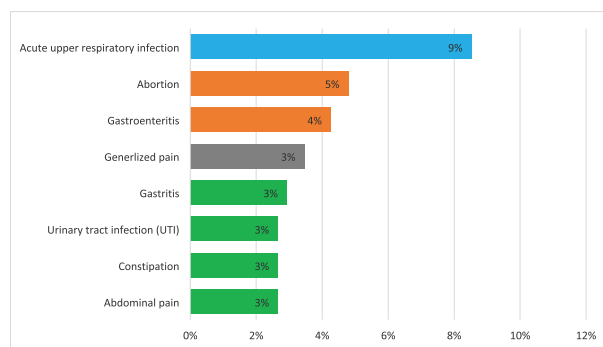

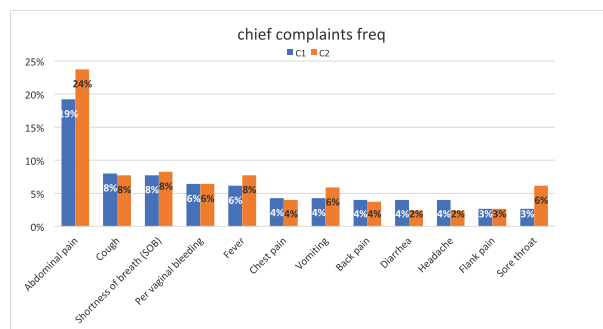**Figure 2.** *Diagnosis in the second visit (n = 375).*

Figure 3. *Chief complaints in the first and return visit.*
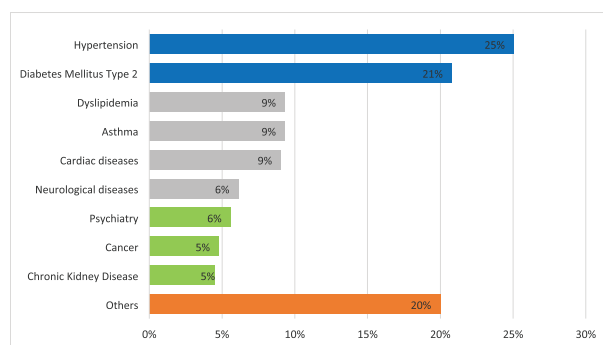

Figure 4. *Comorbidities.*

by general surgery (21%), obstetrics and gynecology (13%), and oncology (8%). All of these admissions were taken to the general wards, and none were in the intensive care unit (ICU).

Finally, the mortality rate within 1 month after discharge was 0.8%. Among these, the first one was diagnosed with upper respiratory tract infection upon the first visit and came back with a cardiac arrest in the second visit. The other two were diagnosed with pneumonia and gastric ulcers, respectively; both died during their second visit.

Discussion

The main goal of our study was to investigate the most common chief complaints and diagnoses in patients who returned to the ED within 72 hours after discharge from January to December 2017. The slight increase in the number of female return visits (53%) may be because of the obstetric and gynecological complaints or diagnoses. For example, the results showed that patients with vaginal bleeding as the chief complaint were one of the most common causes of the return visit. Spontaneous abortion was the second most common problem upon the second ED visit.

The main outcomes of the study showed that the most common chief complaint was abdominal pain: 19% of first visits and 23.7% in the second visit. Here, the study results are consistent with other international studies. A Taiwanese study showed that the most common chief complaint causing ED revisits was abdominal pain [7]. Another multistate US study showed that the most frequent presenting symptom was abdominal pain along with skin infections. Abdominal pain was also the most common chief complaint in a Singaporean study [17]. These results were attributed to the vague surgical and medical differential diagnoses of this presenting complaint [11].

The most common diagnosis for both the first and the second visits was upper respiratory tract infections in 10% and 9%, respectively. This may be because patients usually tend to come back to the ED if their symptoms do not subside immediately after their first visit. This shows the importance of patient counseling, education, and instruction to when to come back to the ED. The study also evaluated the rates of ED revisits within 72 hours with an incidence rate of 6.1%, and this rate is considered high versus other international studies that showed the following percentages: 5.47% in Taiwan [7] and 3.25% in Singapore [5]. However, in Texas, the incidental rate of return visit was 6.45%, which is comparable to our results [18]. However, a previous study was conducted in the same institution and evaluated the rates of ED revisits within 72 hours for adults with chronic diseases between 13 September 2015 and 29 July 2017 and showed an incidence rate of 13%, which is higher than previous reports likely due to their focus on patients who revisited with chronic diseases only [12]. The reason for the variation of incidence rate between different studies may be due to different definitions of return visit and different populations with various inclusion and exclusion criteria.

The study further addresses the admission rates after the second revisit: 17% of patients were admitted, and some of them were admitted because they were more ill than the first presentation. Others were admitted for further evaluation, and most patients were admitted to the internal medicine and general surgery wards with no ICU admission. This rate of admission is lower than other studies. A study conducted in Taiwan and another study in the USA showed 22% and 29% of the patients were admitted after the second visit, respectively [19,11]. In a study carried out in Belgium, the admission rate after the initial discharge was 36.1% [9]. In an ED in South Korea, the rate of admission was 24% which is also higher than the result in this study [10]. It is difficult to compare between these numbers because of the difference in institutional admission policies and illegibility rules.

Comorbidities play a major role in increasing the risk of returning to the ED. Previous research in our center shows that patients with chronic comorbidities had an increased risk of returning to the ED after the initial visit versus the general population [12]. Patients with comorbidities are also at an increased rate of admission [17]. Our results showed that the most frequent comorbidities associated with revisits were hypertension, type II diabetes mellitus, and dyslipidemia. In Singapore, DM2 was the most common comorbidity in patients returning to the ED [17]. This may be due to the various end-organ complication of diabetes leading to more hospital visits. Reasons for the increased number of visits to the ED in patients with chronic diseases may be due to the multiple complaints regarding their chronic conditions. The mortality rate in our study was 0.8%, which is consistent with another study carried out in Lebanon (0.7%) [20].

Conclusion

In conclusion, these results underscore the importance of patient counseling, education, and instructions as to when to return to the ED. The incidence rate of patient returning to the ER in our study is considered high and should be further explored by reassessing the admission and discharge policies. More attention and preventive treatment measures are needed, for complaints such as abdominal pain, to avoid return visits. We also recommend conducting larger studies in several emergency centers to be more representative and to explore the admission and discharge policies, as well as the quality of care in these centers.

Acknowledgments

List of Abbreviations

DM2	Diabetes mellitus type 2
ED	Emergency department
ER	Emergency room
HTN	Hypertension
ICU	Intensive care unit
KAMC	Abdulaziz Medical City
KAIMRC	King Abdullah International Medical Research Center
Mrns	Medical record numbers
NGHA	Ministry of National Guard Health Affairs
SOB	Shortness of breath

Author details

Majed H. Nasradeen[1], Muhannad I. Althunayan[1], Alwaleed K. Aljamaan[1], Abdulrahman M. Aljehani[1], Fajr B. Alqahtani[2], Nawfal Aljerian[1,3,4,5], Mohammed Alhelail[5], Aamir Omair[6]

1. College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia
2. College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia
3. Medical Referrals Center, Ministry of Health, Riyadh, Saudi Arabia
4. National Heath Command Center, Ministry of Health, Riyadh, Saudi Arabia
5. Department of Emergency Medicine, King Abdulaziz Medical City, Ministry of National Guard, Riyadh, Saudi Arabia
6. Research Unit, College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

References

1. Schneider SM, Hamilton GC, Moyer P, Stapczynski JS. Definition of emergency medicine. Acad Emerg Med. 1998;5(4):348–51. https://doi.org/10.1111/j.1553-2712.1998.tb02720.x

2. Shin TG, Jo IJ, Choi DJ, Kang MJ, Jeon K, Suh GY, et al. The adverse effect of emergency department crowding on compliance with the resuscitation bundle in the management of severe sepsis and septic shock. Crit Care. 2013;17(5):R224. https://doi.org/10.1186/cc13047

3. Sun BC, Hsia RY, Weiss RE, Zingmond D, Liang LJ, Han W, et al. Effect of emergency department crowding on outcomes of admitted patients. Ann Emerg Med. 2013;61(6):605–11. https://doi.org/10.1016/j.annemergmed.2012.10.026

4. Abualenain J, Frohna WJ, Smith M, Pipkin M, Webb C, Milzman D, et al. The prevalence of quality issues and adverse outcomes among 72-hour return admissions in the emergency department. J Emerg Med. 2013;45(2):281–8. https://doi.org/10.1016/j.jemermed.2012.11.012

5. Chan AH, Ho SF, Fook-Chong SM, Lian SW, Liu N, Ong ME. Characteristics of patients who made a return visit within 72 hours to the emergency department of a Singapore tertiary hospital. Singapore Med J. 2016;57(6):301. https://doi.org/10.11622/smedj.2016104

6. Ngai KM, Grudzen CR, Lee R, Tong VY, Richardson LD, Fernandez A. The association between limited English proficiency and unplanned emergency department revisit within 72 hours. Ann Emerg Med. 2016;68(2):213–21. https://doi.org/10.1016/j.annemergmed.2016.02.042

7. Wu CL, Wang FT, Chiang YC, Chiu YF, Lin TG, Fu LF, Tsai TL. Unplanned emergency department revisits within 72 hours to a secondary teaching referral hospital in Taiwan. J Emerg Med. 2010;38(4):512–7. https://doi.org/10.1016/j.jemermed.2008.03.039

8. Rehmani R, Norain A. Trends in emergency department utilization in a hospital in the Eastern region of Saudi Arabia. Saudi Med J. 2007;28(2):236.

9. Verelst S, Pierloot S, Desruelles D, Gillet JB, Bergs J. Short-term unscheduled return visits of adult patients to the emergency department. J Emerg Med. 2014;47(2):131–9. https://doi.org/10.1016/j.jemermed.2014.01.016

10. Kim DU, Park YS, Park JM, Brown NJ, Chu K, Lee JH, et al. Influence of overcrowding in the emergency department on return visit within 72 Hours. J Clin Med. 2020;9(5):1406. https://doi.org/10.3390/jcm9051406

11. Duseja R, Bardach NS, Lin GA, Yazdany J, Dean ML, Clay TH, et al. Revisit rates and associated costs after an emergency department encounter: a multistate analysis. Ann Intern Med. 2015;162(11):750–6. https://doi.org/10.7326/M14-1616

12. Ahmed AE, AlBuraikan DA, Almazroa HR, Alrajhi MN, ALMuqbil BI, Albaijan MA, et al. Seventy-two-hour emergency department revisits among adults with chronic diseases: a saudi arabian study. Ther Clin Risk Manag. 2018;14:1423. https://doi.org/10.2147/TCRM.S168763

13. White D, Kaplan L, Eddy L. Characteristics of patients who return to the emergency department within 72 hours in one community hospital. Adv Emerg Nurs J. 2011;33(4):344–53. https://doi.org/10.1097/TME.0b013e31823438d6

14. Cheng SY, Wang HT, Lee CW, Tsai TC, Hung CW, Wu KH. The characteristics and prognostic predictors of unplanned hospital admission within 72 hours after ED discharge. Am J Emerg Med. 2013;31(10):1490–4. https://doi.org/10.1016/j.ajem.2013.08.004

15. Hu KW, Lu YH, Lin HJ, Guo HR, Foo NP. Unscheduled return visits with and without admission post emergency department discharge. J Emerg Med. 2012;43(6):1110–8. https://doi.org/10.1016/j.jemermed.2012.01.062

16. Cheng J, Shroff A, Khan N, Jain S. Emergency department return visits resulting in admission: do they reflect quality of care? Am J Med Qual. 2016;31(6):541–51. https://doi.org/10.1177/1062860615594879

17. Soh CH, Lin Z, Pan DS, Ho WH, Mahadevan M, Chua MT, et al. Risk factors for emergency department unscheduled return visits. Medicina. 2019;55(8):457. https://doi.org/10.3390/medicina55080457

18. Huggins C, Robinson RD, Knowles H, Cizenski J, Mbugua R, Laureano-Phillips J, et al. Large observational study on risks predicting emergency department return visits and associated disposition deviations. Clin Exp Emerg Med. 2019;6(2):144. https://doi.org/10.15441/ceem.18.024

19. Tsai IT, Sun CK, Chang CS, Lee KH, Liang CY, Hsu CW. Characteristics and outcomes of patients with emergency department revisits within 72 hours and subsequent admission to the intensive care unit. Tzu Chi Med J. 2016;28(4):151–6. https://doi.org/10.1016/j.tcmj.2016.07.002

20. Hiti EA, Tamim H, Makki M, Geha M, Kaddoura R, Obermeyer Z. Characteristics and determinants of high-risk unscheduled return visits to the emergency department. Emerg Med J. 2020;37(2):79–84. https://doi.org/10.1136/emermed-2018-208343