ORIGINAL ARTICLE / ÖZGÜN ARAŞTIRMA MAKALESİ

Unscheduled Revisits within 24 Hours to the Pediatric Emergency Department: A First Single-Center Prospective Study in Turkey

Çocuk Acil Servise 24 Saat İçerisinde Yapılan Tekrar Başvurular: Türkiye'de Yapılmış İlk Prospektif Çalışma

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ABSTRACT

Aim: The evaluation of the patients who revisit the emergency department is used as one of the quality indicators of the emergency services. Revisits contribute to the increase in the emergency crowd, cause medical and legal problems. In our study, we aimed to determine the demographic and clinical features, revisit rates, and medical, institutional, or individual risk factors of patients who revisited Ankara University Hospital Child Emergency Department in the early period.

Material and Methods: 622 patients who revisited the pediatric emergency department with the same or related symptoms within 24 hours were included..

Results: The revisit rate was 0.54%. The age ranges of 252 (40.5%) patients were in 0-2 years. The complaints were 266(42.8%) fever, 114 (18.3%) were vomiting, 99 (15.9%) wheezing-cough, and 52 (8.4%) abdominal pain. The reasons for a revisit were increased or continued complaints in 453 (72.8%), new complaint in 115 (18.5%), not being fully informed by doctors in 31 (5%), treatment-related complications in 12 (1.9%), not taking the prescribed treatment in 11 (1.8%) patients. The twenty one (3.4%) of the patients were hospitalized, 156 (25.1%) were taken into observation, recommended treatment were changed in 97 (15.6%), additional examinations were made in 126 (20.3%) and the same recommendations were repeated in 194 (31.2%) patients. The recommended treatment was changed by additional examinations in 28 (4.5%) of the patients. It was determned that 6 (28.5%) had appendicitis and 6 (28.5%) had pneumonia in hospitalized patients and 5 (83%) of the patients hospitalized for pneumonia were under 1 year of age.

Conclusion: The patients with a history of hospitalization and chronic diseases were hospitalized more often and We think that it is necessary to carefully evaluate upper respiratory tract infections and abdominal pain complaints in young children and to plan a close control examination when necessary.

Keywords: Revisit, pediatric emergency medicine, emergency medical services utilization

ÖZ

Amaç: Acil servise tekrar başvuran hastaların değerlendirilmesi, acil servis hizmetinin kalite göstergelerinden biri olarak kullanılmaktadır. Tekrar başvurular acil servis kalabalığını artırarak kalabalığın yol açtığı tüm sorunlara katkıda bulunmakta ve hasta ile doktorlar açısından tıbbi ve hukuki sorunlara neden olmaktadır. Çalışmamızın amacı; Ankara Üniversitesi Hastanesi Çocuk Acil Servisi'ne erken dönemde tekrar başvuran hastaların demografik ve klinik özelliklerini, tekrar başvuru oranlarını ve hastaların tıbbi, kurumsal veya bireysel risk faktörlerini belirlemekti.

Gereç ve Yöntemler: Çalışmamıza çocuk acil servise 24 saat içerisinde aynı veya ilişkili semptom ile tekrar başvuran 622 hasta dahil edildi.

Bulgular: Tekrar başvuru oranı % 0,54 olarak saptandı. Tekrar başvuran hastaların 252 (%40,5)'si 0-2 yaş aralığındaydı. Başvuru şikayetlerinin 266 (%42,8)'sının ateş, 114 (%18,3)'ünün kusma, 99 (%15,9)'unun hırıltı-öksürük, 52 (%8,4)'sinin karın ağrısı olduğu saptandı. Hastaların tekrar başvuru sebepleri incelendiğinde 453 (%72,8)'ünün şikayetlerinin artması veya devam etmesi, 115 (%18,5)'inin yeni bir şikayeti olması, 31 (%5)'inin doktorun aileyi tam olarak bilgilendirmemiş olması, 12 (% 1.9)'sinin tedaviye bağlı yan etki, 11 (%1,8)'inin ise reçete edilen tedaviyi almaması nedeniyle tekrar başvurduğu saptandı. Hastaların tekrar başvuru sonuçlarına bakıldığında hastaların 21 (%3,4)'inin hastaneye yatırıldığı, 156 (% 25,1)'sının müşahadeye alındığı, 97 (%15,6)'sinin ilacının değiştirildiği, 126 (% 20,3)'sına ek tetkik yapıldığı, 194 (%31,2)'üne aynı önerilerin tekrarlandığı, 28 (% 4,5)'ine ek tetkik yapılarak ilacının değiştirildiği saptandı. Hastaneye yatırılan hastalara bakıldığında 6 (%28,5)'sının apandisit, 6 (%28,5)'sının pnömoni olduğu saptandı. Pnömoni nedeni ile yatırılan hastaların 5 (%83)'i 1 yaşından küçüktü.

Sonuç: Tekrar başvuran hastalardan başvuru öncesi hastane yatış öyküsü ve kronik hastalığı olanların daha fazla hastaneye yatırıldığı saptandı. Bir yaş altı çocuklarda özellikle üst solunum yolu enfeksiyonlarının ve tüm çocukluk döneminde karın ağrısı şikayetlerinin dikkatle değerlendirilmesi ve gerektiğinde yakın kontrol muayenesinin planlanması gerektiğini düşünmekteyiz

Anahtar Kelimeler: Tekrar başvuru, çocuk acil servis, acil servis kullanımı

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Introduction

The rapid increase of Emergency Department (ED) visits is a common problem in most countries (1). The function of the ED includes the assessment of presenting patients and the determination of the need for inpatient care or outpatient treatment and follow-up (2). Application within 48-72 hours after the first visit to the ED is considered as "revisit"(3). There are studies in the literature ranging from 24 hours to 6 months (6). In children, the frequency of revisit within the first 24 hours has been reported to be 1.79%, and the reasons for revisits were generally relied on shortcomings due to hospital or healthcare providers (7).

Evaluation of patients who revisit the ED in the early period is used as one of the quality indicators of the ED (4). When patients return within a short time after being evaluated in the ED with the same complaint, it is generally thought that their initial evaluation and treatment are inadequate (5). Reducing unplanned revisits to the ED will help to decrease the number of repetitive patients and reduce the workload of the emergency staff, decrease the medical expenses, provide better quality emergency care to the patients, increase patient satisfaction and reduce the legal problems of the doctors (8, 9).

This study aims to determine our ED's revisit rates to and evaluate the demographic and clinical characteristics of patients who revisit within the first 24 hours and investigate the medical, institutional, or individual risk factors of these patients. The reason why considered such a precipitated time was to investigate urgent revisits that possibly represent a serious deficiency of emergency health care.

Material and Methods

This prospective study was conducted in Ankara University Faculty of Medicine, Children's Hospital, Pediatric Emergency Department (PED) between March 01, 2018, to February 28, 2019, to investigate the patients who revisited our PED. Our hospital is a Tertiary Care Pediatric hospital with 12 bed-capacity. Our PED provides care for approximately 115.000 patient visits per year. Each patient visit is recorded in a computerized database.

During the year, patients who were younger than 18 years old and revisited to the PED with the same or related complaint were included in our study. The data recording form of the patients who met the study criteria was filled. Patients who gave informed consent to participate in the study were asked an open-ended manner questionnaire. Patients who revisited with a complaint that is unrelated to their first visit, who left the PED with their request at their first revisit were excluded. Informed consent was obtained from all patients.

Patients data form includes the age, the time and complaint at the first visit, history of hospitalization, the revisiting reason, revisiting time, managements of revisit, the distance of the patient's home from the hospital, the way of hospital admission, the socioeconomic and education levels of the parents. Those who earn less than 2000 Turkish liras per month were considered to have a low socioeconomic level. Those whose monthly earnings were between 2000-5000 Turkish liras were considered to have a medium socioeconomic level. Those whose monthly earnings were more than 5000 Turkish liras were considered to have a high socioeconomic level. The study was carried out with the approval of the responsible Ethics Committee (12.11.2018 /18-1182-18) in accordance with National Law and the Helsinki Declaration from 1975 (in its current revised form).

Statistical Analysis

Statistical evaluation was performed with IBM SPSS 22 (SPSS Inc., Chicago, IL, USA) package program. Numerical variables with normal distribution mean ± standard deviation, median (minimum-maximum) numerical variables without frequency, and categorical variables (percentages). To evaluate the differences between the two groups; Student's t-test is used when it meets the parametric test prerequisites and the Mann-Whitney U test is used when it does not. The relationship between the two variables was evaluated with the Pearson correlation. If not normally distributed, the Spearman correlation was selected. Relationships between categorical variables were analyzed with Fisher's Exact Test and Chi-Square test. $p < 0.05$ and $p < 0.01$ levels were considered statistically significant.

Results

There was a total of 114.216 visits to the PED during the one-year study period. A total of 752 (0.66%) of these returned to PED within 24 hours. Ninety-five patients who came for control examination and 35 patients who applied with unrelated complaints with their first visit were excluded. The evaluated number of revisits was 622 and the revisit rate was 0.54% (Figure 1).

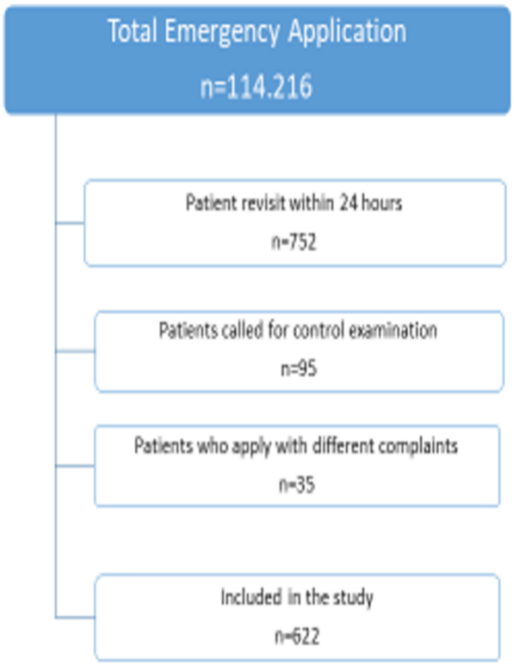

Figure 1. The flow-chart of the study

Almost half of the patients (40.5%) were younger than two-years-old. Most of the patients; 420 (67.5%) had a moderate socio-economic level. Four hundred thirty-three of patients (69.9%) revisits time were 16:01-24:00. Two hundred sixty-six (42.8%) of patient's presenting complaints were fever. Four hundred eighty-three (72.8%) of patient's reasons for revisits were increased or continued complaints. One hundred ninety-four (31.2%) of patients revisit results there the same recommendations given.

The demographic data of the patients, seasonal distribution, application hours, application complaints, reasons for revisiting and revisit results are shown in Table 1.

Chronic disease was present in 16.1% of patients. The most common chronic disease was asthma (32%). Five hundred and one (80.5%) did not apply to any Primary Health Care Institution before revisit.

The rate of observation to patients with chronic diseases was statistically significantly higher than those without chronic diseases ($p<0.001$). No significant difference was found in other variables (Table 2).

The rate of observation in patients with hospitalization history was statistically higher ($p <0.001$). No significant difference was found in other variables (Table 3).

The most common diagnoses were appendicitis and pneumonia. The diagnoses of the patients after revisits are shown in the table (Table 4).

Most of the patients who were hospitalized with pneumonia were under the age of one, and all were diagnosed as upper respiratory tract infections at the first application.

Discussion

To know the characteristics of patients who are likely to revisit the ED, is very important because of the higher mortality and morbidity rates of patients who revisit (10). We determined the causes of revisits and what was done to patients as a result of a revisit.

Several studies indicate that the '72-hour revisit rate' and also cause and results (11). However, the cause and results of 24 hours revisit are unclear. It is clear that return visits within 24 hours of discharge are not a suitable outcome of an ED visit as they may contribute to overcrowding of the ED and could serve as an indicator of the quality of care in the ED (12). The first 24 hours revisit was evaluated by only a single study examining revisits to the PED (7). The present study was therefore conducted to determine the cause and results of return visits within 24 hours.

In our study revisit rate was 0.54%. Since most of the revisit studies are revisits performed in the first 72 hours, the rate of revisit was found to be higher in some studies. The inclusion of patients who revisit only in the first 24 hours may explain the low rate of a revisit. Although the revisit rate was low in our study, it was noteworthy that 501 (80.5%) of the patients did not apply to the Primary Health Care Institution. Each return visit to ED of the patient is associated with various deficiencies either of the hospital, health providers, or patient.

The studies have shown that the risk of revisit is higher in the first 2 years of age (8). Our data obtained that two hundred fifty-two (40.5%) of the revisit patients were in the 0-2 age range.

Goldman and his friends also found that the most frequent revisits were between 16:01-24:00 (2). In our study, 52 (8.4%) patients applied between 00:01-08:00, 137 (22%) patients applied between 08:01-16:00 and 433 (69.6%) patients applied between 16:01-24:00. This period is when emergency services are at their peak. The emergency crowd reduces the clinical evaluation quality of the patients and increases the risk of a revisit. Therefore, increasing the number and quality of physicians in periods when the number of patients increases may decrease the rate of a revisit.

In our study, the same recommendations were repeated for 194 (31.2%) of the patients who revisit and also we think the fact that the risk groups could not be predicted in the first evaluation shows that both the information and the quality of the examination were adversely affected. Also, It was reported that the reasons for a revisit to the PED were for continuity of complaints and not for the satisfaction of the family about their children's care in several studies (13, 14). In our study 453 (72.8%) of the patients revisit due to increased or continued complaints.

Fever, vomiting, abdominal pain, and upper respiratory tract infection were reported to be the most common complaints of presenting (15). In this study, most of the patients have complained of fever (42.8%), vomiting had the second-highest rate (18.3%), followed by wheezing-cough (15.9%), lastly abdominal pain (8.4%).

Studies reported that the most common diagnoses of patients hospitalized after revisit are respiratory tract diseases, abdominal diseases, urinary tract infections, and psychiatric disorders (10, 15). The diagnosis of patients who were hospitalized after revisit was appendicitis (28%) and pneumonia (28%) in our study. Five (83%) of the patients hospitalized for pneumonia were under 1 year of age. We suggest evaluating the children more carefully who are at and less than 1-year old. The other most common reason for hospitalization was appendicitis, abdominal pain is one of the most common reasons for admission to the ED, and acute appendicitis is one of the leading causes of malpractice (16). Also, appendicitis should be considered in every case of abdominal pain. Even if the abdominal examination was negative, the patient history should be evaluated carefully and to order radiologic imagine if necessary, to rule out appendicitis.

	Patient (n=622)	Percentage (%)
Age		
0-2 year	252	40.5
2-7 year	246	38.9
7-18 year	124	20.6
Socio-economic levels		
Low	50	8.5
Moderate	420	67.5
High	152	24.5
Seasonal distribution		
Spring	124	20
Summer	164	26
Autumn	156	25
Winter	178	29
Time of revisits		
00:01-08:00	52	8.4
08:01-16:00	137	22
16:01-24:00	433	69.6
Presenting complaints		
Fever	266	42.8
Vomiting	114	18.3
Wheezing-cough	99	15.9
Abdominal Pain	52	8.4
Rash	16	2.6
Restlessness	12	1.9
Reason for revisits		
Increased or continued complaints	453	72.8
New complaints	115	18.5
Inadequate information was given by the doctor	31	5
Treatment-related side effects	12	1.9
Unreceived prescribed treatment	11	1.8
Revisit results		
Same recommendations were given	194	31.2
Taken into observation room	156	25.1
Additional examinations were performed	126	20.3
Medications were changed	97	15.6
The drug was changed by additional examination	28	4.5
Patients were admitted to the hospitalized	21	3.4

Table 1. Demographic, descriptive, and clinical characteristics of the patients

Revisits results	Presence of chronic disease, (n, %)	
	Yes	No
Patients were admitted to the hospitalized	6 (6)	15 (2.9)
Taken into observation room*	38 (38)	118 (22.6)
Medications were changed	14 (14)	83 (15.9)
Additional examinations were performed	13 (13)	113 (21.6)
Same recommendations were given	21 (21)	173 (33.1)
The drug was changed by additional examination	8 (8)	20 (3.8)
Total	100 (100)	522 (100)

*This variable p<0.001

Table 2. Revisits results and presence of chronic disease

We found that the rates of hospitalization and observation of revisited patients are higher in those who have a hospitalization history or a concomitant chronic disease, which is similar to the study published by Akenroye et al. (4). The most common accompanying chronic disease was asthma 32 (32%). The reason for revisits of 49 (49%) of those with chronic disease was found to be related to their underlying disease. Studies have also found that asthma is the most common chronic disease in recurrent patients (17).

Revisits results	Hospitalization history (n, %)	
	Yes	No
Patients were admitted to the hospitalized	8 (7.2)	13 (2.5)
Taken into observation room*	50 (45)	106 (20.7)
Medications were changed	13 (11.7)	84 (16.4)
Additional examinations were performed	15 (13.5)	111 (21.7)
Same recommendations were given	16 (14.4)	178 (34.8)
The drug was changed by additional examination	9 (8.1)	19 (3.7)
Total	111 (100)	511 (100)

*This variable p<0.001

Table 3. Revisits results and hospitalization history

Limitations

This study has some limitations. First, it is a single-center study, and the second some of the revisited patients had applied to another hospital after the first evaluation. Furthermore, due to the lack of the same triage team, the triage status of the patients could not be examined.

Conclusion

Our study differs from other studies in terms of the present article is the prospective first report of return visits within 24 hours of discharge ED and examining primary care applications. In our study, the number of patients admitted to the third level emergency service without applying to the first step is so high which is the most important factor for cause crowded in ED. Using first step care centers more actively can reduce the number of revisits by reducing the ED crowd. Spending more time with patients in the emergency department and answering all the questions of patients about diagnosis and treatment may reduce revisits. Being more careful in patients with chronic disease and a history of hospitalization may reduce morbidity and mortality.

Diagnoses	Patients, n (%)
Appendicitis	6 (28)
Pneumonia	6 (28)
Febrile convulsion	2 (9)
Acute pyelonephritis	2 (9)
Acute gastroenteritis	1 (5)
Viral encephalitis	1 (5)
Aseptic meningitis	1 (5)
Lymphadenitis	1 (5)
Bronchiolitis	1 (5)

Table 4. The diagnosis of patients who were hospitalized after revisit

Therefore, further studies involving multiple centers and greater sample size to clarify the effects of revisit reasons on the emergency crowd, as well as the negative consequences of the emergency crowd on information and the quality of the examination, are needed. So, further studies should aim to find possible solutions.

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Authors' Contribution: The authors confirm sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

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All authors declared that they follow the rules of Research and Publication Ethics.

References

1.Erenler AK, Akbulut S, Guzel M, et al. Reasons for Overcrowding in the Emergency Department: Experiences and Suggestions of an Education and Research Hospital. Turk J Emerg Med. 2014;14(2):59-63.
2.Goldman RD, Ong M, Macpherson A et al. Unscheduled return visits to the pediatric emergency department-one-year experience. Pediatric emergency care. 2006;22(8):545-9.
3.Alessandrini EA, Lavelle JM, Grenfell SM et al. Return visits to a pediatric emergency department. Pediatric emergency care. 2004;20(3):166-71.
4.Akenroye AT, Thurm CW, Neuman MI et al. Prevalence and predictors of return visits to pediatric emergency departments. J Hosp Med. 2014;9(12):779-87.
5.Dubosh N, Lewis J, Ullman E et al. Resident Education on Misdiagnosis and Quality Assurance in Emergency Medicine (EM) Training Programs. Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health. 2016;17(4.1).
6.Han CY, Chen LC, Barnard A et al. Early Revisit to the Emergency Department: An Integrative Review. J Emerg Nurs. 2015;41(4):285-95.
7.Kilicaslan O, Sonmez FT, Gunes H et al. Short Term Unscheduled Revisits to Paediatric Emergency Department - A Six Year Data. J Clin Diagn Res. 2017;11(3):Sc12-sc5.
8.Bergese I, Frigerio S, Clari M, et al. An innovative model to predict pediatric emergency department return visits. Pediatric emergency care. 2019;35(3):231-6.
9.O'Malley PJ, Brown K, Krug SE. Patient-and family-centered care of children in the emergency department. Pediatrics. 2008;122(2):e511-e21.
10.Cozzi G, Ghirardo S, Fiorese I et al. Risk of hospitalisation after early-revisit in the emergency department. J Paediatr Child Health. 2017;53(9):850-4.
11.Martin-Gill C, Reiser RC. Risk factors for 72-hour admission to the ED. Am J Emerg Med. 2004;22(6):448-53.
12.Bardach NS, Vittinghoff E, Asteria-Peñaloza R et al. Measuring hospital quality using pediatric readmission and revisit rates. Pediatrics. 2013;132(3):429-36.
13.Augustine EM, Bekker TD, Goel A et al. A survey of return visits to the pediatric emergency department: the caretakers' perspective. Pediatric emergency care. 2018;34(1):27-32.
14.Augustine EM, Kreling BA, Chamberlain JM. Caretakers' perspectives on return pediatric emergency department visits: a qualitative analysis of focus groups. Pediatric emergency care. 2016;32(9):594-8.
15.Ali AB, Place R, Howell J, Malubay SM. Early pediatric emergency department return visits: a prospective patient-centric assessment. Clinical pediatrics. 2012;51(7):651-8.
16.Selbst SM, Korin JB. Pediatric emergency medicine. Pediatric Emergency Care. 1998;14(4):302-304.
17.Johnson LH, Beck AF, Kahn RS et al. Characteristics of pediatric emergency revisits after an asthma-related hospitalization. Annals of emergency medicine. 2017;70(3):277-87.