

ANALYSIS OF PATIENTS ADMITTED TO THE EMERGENCY UNIT OF A UNIVERSITY CHILDREN'S HOSPITAL IN TURKEY*

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SUMMARY: Karaböcüoğlu M, Kartoğlu Ü, Molzan J, Uğur S, Uzel N, Neyzi O. (Institute of Child Health, İstanbul University, İstanbul, Turkey). Analysis of patients admitted to the emergency unit of a university children's hospital in Turkey. J Turk Pediatr 1995; 37: 209-216.

A retrospective analysis of the computerized data of patients admitted to our Emergency Unit Inpatient Service in 1991 was conducted to obtain data about age, sex, referred sources, admission period, monthly admission rates, diagnoses and eventual outcome. More than 47% of patients were younger than one year of age. The most common causes for hospital admission were infectious, respiratory and neurological diseases. The mean hospitalization period was 3.26 days. More than 60% of patients were treated by the Emergency Unit staff. The net mortality rate was 2.9%, infectious diseases being the most common cause of mortality. We conclude that demographic and diagnostic data regarding admissions to the Emergency Unit can be utilized to develop new strategies for patient care and to reorganize education programs for pediatric residents. *Key words: pediatric emergency unit, hospital admissions, demographic and diagnostic data.*

Although studies based on hospital data do not reflect general population characteristics, they are important for the development of new strategies and retrospective evaluation of hospital utility^{1,2}. In the case of a teaching hospital, these data gain importance beyond patient care.

İstanbul University Faculty of Medicine Children's Hospital in Çapa has been running a Pediatric Emergency Unit (PEU) since 1980. This PEU is one of the largest emergency referral centers in Turkey, serving a population of 3.5 million people. Information about PEU patients and the procedures to which they were exposed have been loaded into a computer system for the last four years. In order to encourage proper collection of more reliable and complete data, the documentation has been evaluated periodically.

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The purpose of this study was to evaluate the patient data with regard to demographic and diagnostic variables in order to develop new strategies for efficient utilization of the PEU and to establish a more suitable training curriculum for residents there.

Material and Methods

This study consisted of an analysis of computerized data regarding patients admitted to the PEU of İstanbul University Faculty of Medicine Children's Hospital in Çapa in 1991.

Patient information was coded on a special data card called an "inpatient card" which could then be loaded into a computer file. The patient's name, date of birth, sex, referred sources, diagnosis and outcome were recorded on the inpatient card. Diagnostic information on the card was coded by a resident under the heading 999 in accordance with the ICD-79 version.

Control and analysis of the data were done using Foxpro and SPSS/PC computer programs.

Results

The total number of patients admitted to the PEU in 1991 was 1958. Of these admissions, 60.1 percent were male and 39.5 percent were female, a ratio of 1.5:1 ($p < 0.05$). No data as to gender were available for five patients (Table I). Data about the diseases were evaluated under separate headings.

Table I: Frequency of visits to the PEU by Demographic Variables

Sex	Number of Patients	% of Patients
Male	961	60.1
Female	632	39.5
Unrecorded	5	0.4
Total	1598	100.0
Age		
1-29 days	192	12.0
1-12 months	568	35.5
1-3 years	382	23.9
4-7 years	222	13.9
8-11 years	137	8.6
12-15 years	78	4.9
> 16 years	6	0.4
Unrecorded	13	0.8
Total	1598	100.0

Distribution by Age

Age-related data were not available for 13 patients (Table I). Overall, 12 percent were 1-11 months in age, 47.5 percent were less than one year old and more than 85 percent of patients were younger than seven years of age.

Distribution by Months

Seasonal distribution of patients admitted to the PEU in 1991 is shown in Fig. 1. If the distribution of patients were homogenous, 8.3 percent of patients would be admitted each month; however, there were five months (January, March, May, June, July), when the admittance rate exceeded 8.3 percent ($p > 0.05$).

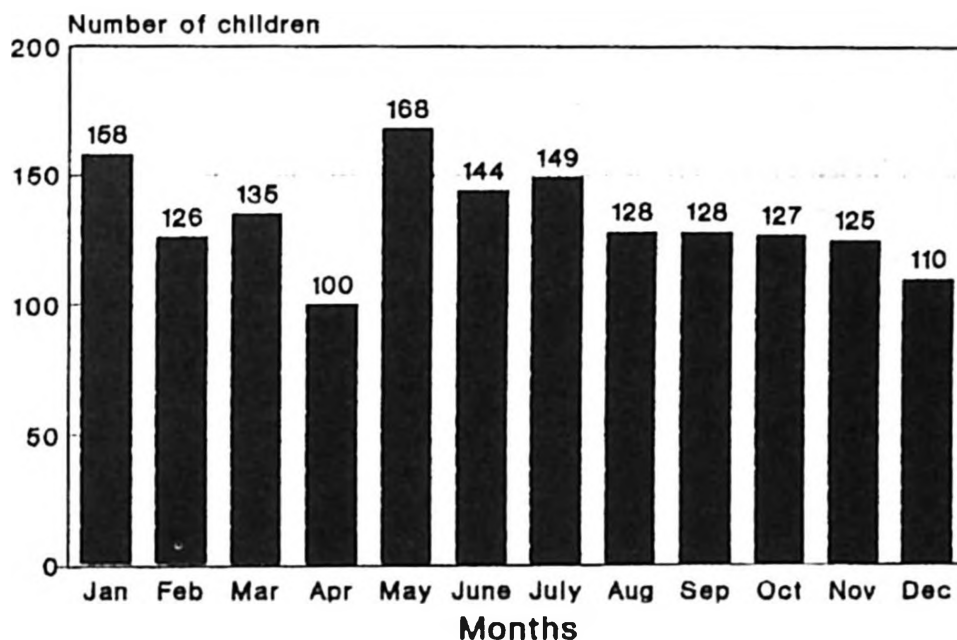


Fig. 1: Rate of visits to the PEU by month in 1991.

Hospitalization Period

Distribution of patients with regard to hospitalization period is shown in Fig. 2. The mean hospitalization period was 3.26 days, and ranged from one to 4 days for 50 percent of patients.

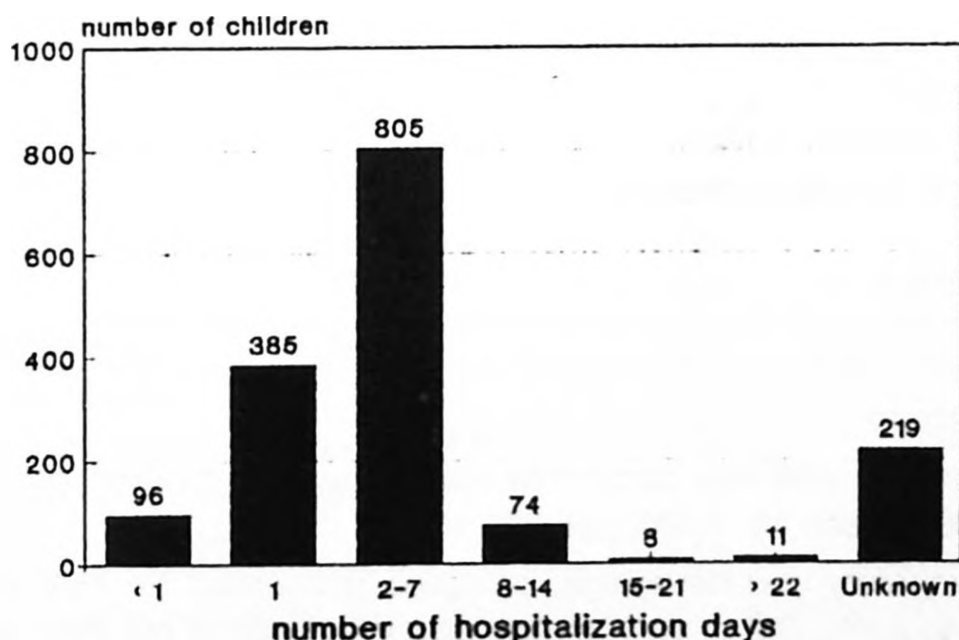


Fig. 2: Distribution of patients by hospitalization period.

Referred Patients (Sources)

The geographical orientation of patients is shown in Table II. Although patients from 36 cities in all geographic areas of Turkey were admitted to the PEU in 1991, most patients were from İstanbul. Since the hospital is located in the area of Marmara, this region contributed the highest number of patients. Of the counties within İstanbul, patients came mostly from Bakırköy, Fatih, Gaziosmanpaşa, Küçükçekmece and Bayrampaşa (31.8%, 8.9%, 8.3%, 8.0%, and 6.4%, respectively), the counties nearest to the hospital.

Table II: Rate of Visits According to Patients' Cities of Origin

City Name	Number of Patients	% of Patients
İstanbul	1392	87.1
Kocaeli	50	3.1
Tekirdağ	27	1.7
Adapazarı	26	1.3
Other Cities	103	6.8
Total	1598	100.0

Distribution by Outcome

The outcome of patients is shown in Table III. There was no significant difference in outcome between males and females ($p > 0.05$). The overall death rate was 7.8 percent (125 patients), with 39 patients (31.2% of deaths) dying within 24 hours and 42 patients (33.6%) dying between the 25th and 48th hours after admission.

Table III: Outcome of Patients Admitted to the PEU

Outcome	Number of Patients	% of Patients
Transport to another hospital	197	12.3
Discharged	628	39.3
Against medical advice	73	4.6
Transport to subspecialties	354	22.2
Died	125	7.8
Unrecorded	221	13.8
Total	1598	100.0

Diagnostic Groups

Since between one and five diagnoses were assigned to each patient, there were 2,259 diagnoses for 1,598 patients.

Infectious respiratory and neurologic diseases accounted for 45.8 percent of diagnoses (Table IV). The most common diseases seen in our PEU are shown in Table V.

Table IV: Distribution by Diagnostic Groups

Diagnostic Groups	Number of Patients	% of Patients
Infectious Diseases	415	18.4
Respiratory Diseases	366	16.2
Neurologic	255	11.3
Intoxications	167	7.4
Unidentified Diseases	161	7.1
Congenital Anomalies	140	6.2
Perinatal Morbidities	127	5.6
Metabolic Diseases	110	4.9
Genitourinary Diseases	103	4.6
Cardiovascular Diseases	102	4.5
Hematologic Diseases	99	4.4
Gastrointestinal Diseases	58	2.6
Oncological Diseases	53	2.3
Connective Tissue Diseases	26	1.2
Endocrine Diseases	23	1.0
Nutritional Diseases	23	1.0
Dermatologic Diseases	12	0.5
Mental Diseases	12	0.5
Immunologic Diseases	6	0.4
Complications of Pregnancy	1	0.0
Total	2259	100.0

Table V: Common Diagnoses at the PEU

Diagnosis	Number of Patients	% of Patients
Pneumonia	227	10.0
Septicemia	188	8.3
Intestinal Infections	154	6.8
Intoxications	126	5.5
Neonatal diseases*	124	5.4
Bacterial meningitis	97	4.3
Acid-base and Electrolyte Disturbance	76	3.3
Congenital cardiac anomalies	73	3.2
Coagulation anomalies	72	3.1

* This group includes prematurity, SGA, birth injury, asphyxia, respiratory difficulties, infections, bleeding, isoimmunization, hyperbilirubinemia and thermoregulation disturbances. The majority consisted of infectious disease (18.5%), hyperbilirubinemia (18.5%) and prematurity (12.9%).

Among causes of death, infectious diseases accounted for the greatest percentage (25.6%) (Table VI). Perinatal and unknown diseases ranked second and third at 16.8 and 14.4 percent, respectively. Regarding main diagnostic groups, sepsis was the most common cause of death (18.4%). Unidentified diseases and prematurity were second and third at 12 and 6.4 percent, respectively.

Table VI: Diagnostic Categories of Mortality at the PEU

Diagnostic Groups	Number of Patients	% of Total Mortality
Infectious Disease	32	25.6
Perinatal Diseases	21	16.8
Unidentified Diseases	18	14.4
Congenital Anomalies	11	8.8
Respiratory Diseases	10	8.0
Cardiovascular Diseases	7	5.6
Oncologic Diseases	7	5.6
Neurologic Diseases	5	5.5
Gastrointestinal Diseases	4	3.2
Metabolic Diseases	3	2.4
Genitourinary Diseases	2	1.6
Hematologic Diseases	2	1.6
Dermatologic Diseases	1	0.8
Connective Tissue Diseases	1	0.8
Nutritional Diseases	1	0.8
Total	125	100.0

Discussion

Although there has been a dramatic increase in the use of emergency department facilities since 1950^{3,4}, there is very little information in the pediatric literature documenting the age, diagnoses, time spent in PEU and outcomes of these children⁵. These data will be very useful and may also assist in plans to allocate resources appropriately and in organizing educational programs with relevant emphasis^{2,6}.

The current study showed that there was a clear majority of males (60.1%) over females (39.5%) seen in the PEU. Since the same result was seen in the study by Rothschild et al.⁷ and yet no difference has been reported in the frequency of admission of the two sexes among patients seen in studies of PEUs western countries^{1,3,8}, we believe that this result reflects a difference in the attitudes of parents toward illness in boys and girls in Middle Eastern countries.

More than 47 percent of our patients were younger than one year old. Our data support earlier observations that PEU usage was related to age, with distribution

skewed to the younger ranges (infants and toddlers)^{2,6}. Since resuscitation and treatment are most difficult in younger patients, we share the ideas of Kisson et al.² that educational programs should place greater emphasis on the needs of the very young. PEUs should also be supplied with equipment necessary for younger patients (e.g. infant mask, infant blood pressure cuffs, smaller catheters, etc.). In the present study, though monthly admission rates did not differ significantly, the highest rate of visits to the PEU occurred in January, May, June and July. We speculated that increased frequency of respiratory infections in winter and gastroenteritis in summer may be reasons for these slight increases in admission rate.

Since we do not have an intensive care unit, we use our PEU as an inpatient facility for critically ill patients. We also provide inpatient care for patients whose diagnoses have yet to be established, and who must be stabilized until their transfer to the appropriate subspecialty ward. Thus, length of stay in our PEU is longer than that reported in the literature^{2,9}.

Though patients were referred from all regions of Turkey, there was an inverse relationship between the distance from the patient's home to the hospital and rate of visits to the PEU similar to that reported previously in the literature^{3,7,8}. The rate of visits to the PEU from Marmara, the area where the hospital is located, was highest. The same was also valid for inner-city visits with the nearest five counties sharing the first five ranks for visits to the PEU.

In this study the evaluation of outcomes showed that more than half of the patients admitted to the PEU were treated by PEU staff. Transfer to other hospitals was mainly due to social factors (economic, parental wish, high turn-over rate at the PEU, etc.) and lack of bed availability. Twenty-two percent of patients were admitted to subspecialty divisions; this group of patients included those who were stabilized or who were diagnosed in the PEU, as suggested by Medina et al¹⁰.

Our results show, that patients with all sorts of diseases were admitted to our PEU, with the greatest percentages having infectious diseases (18%), respiratory system diseases (16%) and neurological problems (11.3%). These figures are similar to Kisson's results². Infectious diseases are also the most common cause for PEU utilization in the literature^{2,6,7}.

One interesting finding in our study, in contrast to other studies^{2,3,7}, was that upper airway pathology, such as viral croup, was not commonly seen in our patient population. We believe that the reason for this difference is that only the inpatient records were reviewed in this study, while other studies have included outpatient charts. Also, since trauma patients are also treated by the Department of Surgery, our results did not include these patients either.

As would be expected in a developing country, the most common cause for mortality was infectious disease in our PEU. Perinatal diseases play an important role in infant mortality in both developing and developed countries¹¹.

Analysis of these data permitted us to reach several conclusions:

1. Pediatric Emergency Medicine, a new and developing subspecialty of pediatrics in our country, is an important component of the medical services provided by the hospital. 2. Our data collection system has some handicaps, and we have made appropriate changes in that system in order to encourage proper collection of more reliable and complete data. 3. Since the majority of our patient population was less than one year old and nearly half had infectious, respiratory or neurologic diseases, we may reorganize our pediatric resident training curriculum to ensure education in the above subspecialties before emergency rotation.

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