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Original Contributions

THE FACTORS AFFECTING NEONATAL PRESENTATIONS TO THE PEDIATRIC EMERGENCY DEPARTMENT

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□ **Abstract—Background: A pediatric emergency department (PED) may be utilized by neonates for nonurgent complaints. Various factors, such as primiparity, maternal age, early postnatal discharge, race, income, and maternal and paternal educational levels, have been reported to affect the acuity of neonatal emergency department utilization. Objective: To determine the characteristics of PED visits by neonates (infants ≤ 28 days of age) and to evaluate the factors affecting the acuity of these visits. Methods: We prospectively collected the data of neonates who were admitted to the PED of a tertiary university hospital within a 6-month period. Presenting problems were classified as acute if diagnostic tests were requested or the patient was hospitalized, unless the final diagnosis was "normal newborn." Results: Over this period, 28,389 children (0–18 years of age) visited the PED, of which 531 were newborns (1.9%). The mean age was 14.1 ± 8.3 days, with a slight predominance of males (57.3%). The chief complaints were jaundice (23.4%), irritability (9.5%), and vomiting (7.1%), and the most common diagnoses were normal newborn (33.9%), indirect hyperbilirubinemia (13.2%), and colic (5.8%). Acute visits were 55.7% of the total visits. Premature infants, infants of multiparous mothers, infants of older mothers (≥25 years), and physician-referred infants were more likely to present with acute problems (*p* values were 0.001, 0.013, 0.006, and <0.001, respectively). Conclusion: The results suggest that there may be a relationship between nonacute neonatal visits to a PED and insufficient knowledge of the caretaker on newborn care. Thus, more detailed education and early postnatal support programs regarding newborn care may help to decrease nonacute PED visits by neonates.** © **2015 Elsevier Inc.**

□ **Keywords—newborn; emergency department; acute visit; primiparity; prematurity**

INTRODUCTION

A pediatric emergency department (PED) may be utilized by neonates for nonurgent complaints. However, the arrival of a newborn to a busy emergency department (ED) is a concern for PED physicians. This concern grows out of several factors, such as crowded waiting and evaluation areas, which are inappropriate for newborns; high risk of acute deterioration; and similar response of newborns to variable types of stress, which makes it difficult to decide about the acuity of the condition (1). In addition, the differential diagnosis for each nonspecific symptom in the neonatal period is extensive (2).

There has also been an increase in early discharges after birth in Turkey over the last few decades, as a result of changing psychosocial factors, health considerations, and financial constraints, which have been seen in other countries. Therefore, the management of early infant care has shifted from the newborn nursery to the PED. There are conflicting results of different studies about the effects of early neonatal discharge on the utilization of a PED

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(3–7). Previously, various factors, such as primiparity, maternal age, marital status, race, income, maternal and paternal educational levels, self-referral, and having a regular physician, have been reported to affect ED utilization (6,8–12).

In our country, there have been increasing rates of newborns being discharged earlier and presenting to the PED with nonacute complaints, although there is no documentation about the increasing use of the PED or examining the urgency of presenting problems or demographic factors associated with ED use by families of newborn infants. In this prospective study, we determined the characteristics of PED visits by neonates and the demographic and perinatal factors associated with acute attendance at a PED of newborns within the first 28 days of life.

MATERIALS AND METHODS

This study was conducted prospectively in the PED of a large tertiary care hospital with more than 55,000 PED visits annually over a 6-month period from February through July 2011.

Data were obtained on all newborns who attended the PED in the neonatal period (≤28 days of age). All neonates visiting the PED were evaluated for neonatal presentations, maternal and neonatal characteristics, and the need for hospitalization and observation at the PED setting. A set of variables, including the age and gender of the patient, gestational week, birth weight, labor type, place of birth, time of discharge after birth, time of presentation to the ED and length of stay in the ED, method of referral (self or physician referred), presenting complaint(s), ED diagnosis, and maternal data (maternal age, parity, educational status) were recorded. We defined early discharge as a postnatal hospital stay of <48 h. The data were analyzed to determine the general characteristics of these patients and to identify the factors affecting the acuity of the visits. The visits were classified as acute if diagnostic tests were requested in the PED or if the patient was hospitalized, unless the final diagnosis was "normal newborn." The triage code assigned by a triage nurse did not refer to an acute presentation because in our ED, all newborns are categorized as emergent or urgent for timely examination and treatment.

For statistical analyses, we used SPSS 15.0 for Windows (IBM, Armonk, NY). Descriptive statistics were presented in the forms of percentages, medians, means, and standard deviations. We compared the groups by using cross tabs and chi-squared test; $p < 0.05$ was accepted as statistically significant.

This study was approved by the research ethics committee of the study hospital.

RESULTS

During the 6-month study period, a total of 28,389 patients visited our PED, of which 531 (1.9%) were neonates. Among those infants, the average age was 14.1 ± 8.3 days, with a median age of 14 days. In total, 52% of infants were <14 days of age, and the remaining infants were ages 14 to 28 days. Males comprised 57.3% (n = 304) of the study group, with a male-to-female ratio of 1.34:1. Gestational age was <37 weeks in 71 infants (13.4%). Deliveries were performed at the hospital in a vast majority (99.6%) of the cases, and the labor type was cesarean section in half of the cases (51.8%). A total of 49 neonates (9.2%) had a birth weight < 2500 g. Additionally, 261 infants (49.2%) presented to the PED out of hours. Forty percent of patients spent <1 h in the PED, and 54% spent 1–6 h and 6% spent 6–24 h. Overall, 66.1% of infants were discharged within 48 h after birth, which was defined as an early postnatal discharge.

The chief complaints of newborns presented to the PED were jaundice (23.4%), irritability (9.5%), and vomiting (7.1%), and the most common diagnoses were normal newborn (33.9%), indirect hyperbilirubinemia (13.2%), and colic (5.8%). Of all patients, 23.2% were hospitalized, and their most frequent diagnoses were indirect hyperbilirubinemia (17.9%) and pneumonia (10.6%). The admission rate in infants ≤7 days of age was found to be 31.8%, whereas it was 29% in infants ≤14 days of age.

Of the PED visits by neonates, 55.7% (n = 296) were classified as acute presentations. A total of 20% of all infants were physician referred, and these infants were more likely to have acute complaints when they visited the PED, compared to self-referred ones ($p < 0.001$). Additionally, 34 (32%) of the 106 physician-referred infants were brought to the PED by ambulance. Acute presentations were more common among infants of multiparous mothers ($p = 0.013$) and mothers older than 25 years of age ($p = 0.006$). Premature infants were also more likely than mature infants to present with acute problems ($p = 0.001$). In addition, no significant difference was found in the acuity of the PED visits between early and late discharged infants in the postnatal period. There was no significant difference in the acuity of PED presentations between patients, with regard to the distance to PED. The other factors, such as age of the infant, maternal educational status, or birth weight, did not significantly affect the acuity of presentation (Table 1).

When we examined the acutely presenting infants (n = 296), according to the hospital admission status, physician-referred infants and infants who were younger than 14 days of age were more likely to be admitted to the hospital ($p < 0.001$ and $p = 0.004$, respectively) (Table 2).