

## PATTERNS OF PEDIATRIC EMERGENCY ROOM VISITS AT KING KHALID UNIVERSITY HOSPITAL, RIYADH

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Saudi Arabia provides free comprehensive health care to all its citizens. The Ministry of Health provides health services on the basis of a three-tier system of health centers, general hospitals and specialist hospitals.<sup>1</sup>

Ninety-eight percent of an estimated population of 16.9 million (1993) have access to health services delivered exclusively through the Ministry of Health. Other governmental sectors, such as the Ministries of Defense, Education, Interior, and National Guard, take care of their respective employees and their families through an organized network of hospitals and health centers. A growing private sector provides health services ranging from basic medical care to highly specialized health services.<sup>1</sup> The Pediatric Emergency Department is an important part of hospital services. Details of pediatric emergency services have been previously reported from many centers around the world. There is a lack of information regarding the users of pediatric emergency services in Saudi Arabia. A similar lack in other parts of the world was stressed by the Korner working party in the UK<sup>2</sup> and Al Saleh et al.<sup>3</sup> from Kuwait.

This study aims at statistical analysis of pediatric patient visits, considering the following variables: age, sex, ethnicity, diagnosis, category of severity, peak hours and days of attendance, referrals, admission and discharge patterns.

### Material and Methods

King Khalid University Hospital is the major teaching hospital of the College of Medicine, King Saud University, in Riyadh. It is one of the largest secondary and tertiary care centers in the area, with a capacity of 800 beds. The pediatric ER, open 24 hours a day, has a high-volume turnover with an average annual attendance of 30,000.

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Along with at least five other emergency rooms attached to government hospitals, it caters to the city of Riyadh, with a total population of 2.8 million. It comprises a triage area, separate waiting rooms for males and females, a nursing station, five examination cubicles, three observation beds and a resuscitation room. Major trauma cases are treated in the adjacent main (adult) ER. The patients attending are Saudis and non-Saudis of various nationalities, both Arabs and non-Arabs. The majority of the patients are walk-in self-referrals.

All ER visits for a period of one year (from June 1994 to June 1995) were studied. The patients included infants and children up to 12 years. The group was divided into four groups: 1) newborns, 2) one month to one year old, 3) over one year to five years old, and 4) five to 12 years. The day was divided into three working shifts, morning (8 a.m. to 4 p.m.), evening (4 p.m. to 12 p.m.) and night (12 p.m. to 8 a.m.).

Morning and night shifts were each staffed by one junior and one senior pediatric resident. The evening shift was usually staffed by two junior and one senior pediatric residents. Patients were categorized by a triage nurse<sup>4</sup> into three categories, according to the severity of problems. Category 1 was acute emergencies needing immediate attention. Category 2 cases were moderately ill patients who did not have life-threatening problems but needed to be seen as soon as possible, and Category 3 consisted of mild cases which could be seen in the primary care clinic. The daily attendance of patients during the week was plotted from Saturday to Friday and monthly attendance was divided into 12 months, January to December. The diagnoses were divided into 10 major groups and each group was subdivided into main diagnoses. The disposition of patients was studied, depending upon whether they were admitted, referred to other facilities, or discharged with or without medication. The StatPac Gold Statistical Analysis Package was used for the study.

### Results

A total of 30,067 cases were recorded during the study period and consisted of 58.4% males and 41.6% females



(male to female ratio 1.4:1). Males outnumbered females in all age groups. Saudi children made up 80.1% and children of all other nationalities 19.9%.

Figure 1 shows the age distribution. There were 2.9% neonates, children aged one month to one year made up 21.4%, and children over age one, but under five years were the largest group, adding up to 46.0%. Children above five years of age made up 26.7. Category 1 (acute emergencies needing immediate attention) included 9.48% of the patients, Category 2 (moderately ill patients who did not have life-threatening problems but who needed to be seen as soon as possible) included 54.66%, and Category 3 (mild cases which could be seen at the primary care clinic) included 35.86%.

Friday was the busiest day of the week (16.3%), followed by Saturday and Thursday. Wednesday was the least busy (12.9%). The busiest time of day was in the evening between 4 p.m. and 12 p.m. (48.5%), followed by morning (8 a.m. to 4 p.m.) (30.9%) and night (12 p.m. to 8 a.m.) (20.6%).

Monthly attendance revealed that there were two peaks, one between March and May (10.3%) and the other between October and November (9.8%). The lowest attendance was between July and August (5.6% to 5.3%). The monthly average was 8.3%. In general, the busy period was between October and May. The number of admissions per month corresponded to the total number of patients (Figure 2).

Patterns of diagnoses revealed that respiratory diseases were the leading group (66.6%), followed by gastrointestinal diseases (12.0%). URTI was the most common diagnosis encountered (32.47%), followed by bronchial asthma (16.45%). The other frequent diagnoses were acute tonsillitis (8.2%), acute gastroenteritis (7.41%), otitis media (6.61%), pneumonia (2.43%), simple trauma (2.35%), and accidental drug ingestion and poisoning (1%). Analysis of the discharge distribution revealed that 81.5% of patients were discharged from the ER with medication and 7.74% were sent home without any medication. Three percent of cases were referred to other facilities and only 5.23% of cases required admission. The remaining cases (2.39%) include those who refused admission or were not available when called. The last group of patients disappeared either after triage or after early treatment while waiting for reassessment.

**Discussion**

Pediatric emergency rooms are commonly used for non-emergency problems by parents who find them to be convenient sources of health care for their children. The results of our study showed that over one-third of patients (36%) were in the non-emergency Category 3, which are simple cases such as URTI, mild gastroenteritis, etc.,

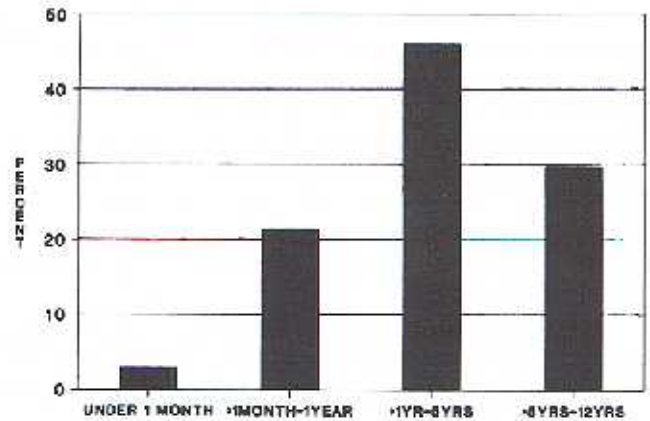


FIGURE 1. Age distribution of patients visiting pediatric emergency rooms during the period of June 1994-June 1995.

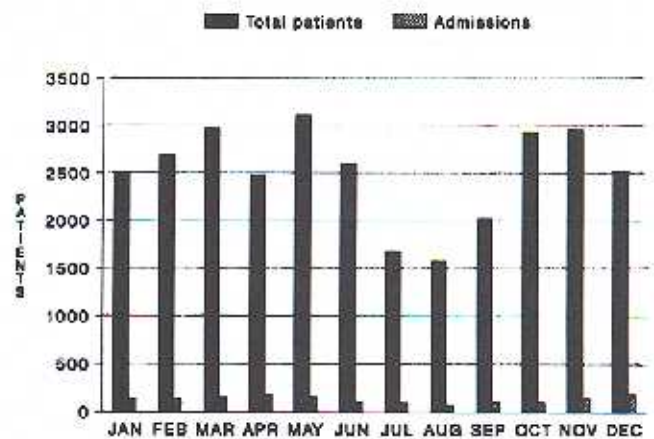


FIGURE 2. Admissions and total number of patients per month.

which can be handled at a primary care clinic. Similar observations have been made by Al-Saleh, et al.,<sup>3</sup> Halperin et al.,<sup>4</sup> and Lane.<sup>5</sup>

Braunstein et al.<sup>7</sup> have shown that the majority of ER visits were not emergencies, a fact acknowledged by both parents and physicians. Recommendations to reduce the number of unnecessary visits to the pediatric emergency room include: 1) increase the number and improve the standard of services at the primary health care clinics; 2) educate through mass media regarding the facilities and services available in the primary health care centers, encourage people to make optimal usage of such centers, and emphasize that the emergency room is for emergency cases only; 3) limit the emergency services to patients who are really sick (Categories 1 and 2). Non-emergency (Category 3) patients should be given appointments to the pediatric primary care clinic the next day or be directed to an after-hours primary care clinic attached to the emergency department. An after-hours walk in clinic attached to the ER was found to be useful for such cases by Weitzman et al.<sup>8</sup> Male cases outnumbered females (ratio



1.4:1), as has been observed in other studies.<sup>3,9,10</sup> Children under one year of age constituted 24.3%. This is similar to figures reported by Bergman et al.<sup>11</sup> and Wingert et al.<sup>12</sup> However, the majority of cases were between one and five years (46%). These last two observations may reflect the male-to-female ratio and the percentage of this age group of children among the childhood population of a developing country. This also puts an extra burden on our ER staff, who should be experienced in managing infants and young children.

The busiest day was found to be Friday. This could be explained by the fact that Friday is the weekly holiday in Saudi Arabia and there are no primary care clinics functioning. Friday was also found to be the busiest day in other studies from the Middle East.<sup>3,9</sup> Reports from Western countries<sup>13</sup> have found Saturday to be the busiest. Wednesday was the least busy day in our study. This may be because many families go out of town for the weekend.

The busiest months were October to May, as has been observed by Al Saleh et al.<sup>3</sup> This is probably due to increased viral infections during the busy winter months, accompanied by asthmatic attacks. In addition, ER visits for acute asthma have been found to increase during winter months and usually in the evening hours, an observation also reported by Canny et al.<sup>14</sup> The low attendance found in the months of July and August coincides with annual school holidays, during which many families leave Riyadh on vacation. The busiest period of the day was from 4 p.m. to 12 p.m. Rothschild et al.<sup>15</sup> and Al Maani et al.<sup>9</sup> have reported 8 a.m. to 12 a.m. in their study and Al Saleh et al.<sup>3</sup> reported 8 p.m. to 3 a.m. in their study as the busiest periods. The difference in these studies could be explained by the fact that most families in Saudi Arabia and Kuwait have to wait for their men to return from work in the afternoon in order to take their children to a hospital.

Respiratory illnesses accounted for 66.6% of the ER visits in our series. This is comparable to other studies by Al Saleh et al.<sup>3</sup> The rate of bronchial asthma in our study was 16%, which is not very much different from the reported incidence of the disease in the pediatric population.

Our study shows that the patterns of attendance and diseases are comparable to other studies.<sup>2,16</sup> It also clearly demonstrates that a large number of patients attend the emergency services for simple problems. This may be because medical treatment is free in this country and patients sometimes seek medical advice from different centers at one time. This could ultimately affect the quality

of services, and also leads to an increase in the waiting time for patients, as well as a waste of resources. The recommendations in terms of reducing the number of nonemergency visits to the ER, discussed above, should be strongly stressed.

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