

Appropriateness of Pediatric Admissions to a Tertiary Care Facility in Israel

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Key words: pediatric hospitalization, appropriateness evaluation, admission criteria

Abstract

Background: Appropriateness of hospital admission has both clinical and economic relevance, especially in light of the growing pressure for increased efficiency of health services utilization. In Israel, the number of referrals and use of the emergency room continue to rise along with an increase in hospital admissions and the number of inappropriate admissions. Using evaluation protocols, such as the Pediatric Appropriateness Evaluation Protocol, international studies have shown that 10–30% of hospital admissions are medically unnecessary. Inappropriate hospitalizations have an economic impact as well as medical and psychological effects on the child and the family.

Objectives: To assess the extent and characteristics of inappropriate pediatric admissions to a tertiary care facility in Israel.

Methods: We conducted a prospective study using chart review of pediatric admissions to Soroka University Medical Center on 18 randomly selected days in 1993, and evaluated the appropriateness of admissions using the PAEP.

Results: Of the 221 pediatric admissions 18% were evaluated as inappropriate. The main reason for such an evaluation was that the problem could have been managed on an ambulatory basis. Inappropriate admissions were associated with hospital stays of 2 or less days, children older than 1 year of age, Jewish children, and self-referrals to the pediatric emergency room.

Conclusions: The assessment and identification of characteristics of inappropriate hospital admissions can serve as indicators of problems in healthcare management and as a basis for improving quality of care and developing appropriate medical decision-making processes.

IMAJ 2001;3:501–503

Health costs and efficient use of hospital resources are essential issues in healthcare delivery and management. Hospital admission rates worldwide continue to rise annually [1,2]. The appropriateness of hospital admission has both clinical and economic relevance, especially in light of the growing emphasis on quality assurance, good healthcare management, and

pressure for increased efficiency of health services utilization [3]. Inappropriate hospitalizations have an economic effect on the healthcare system as well as a psychological and physical impact on both the patient and the patient's family. This issue is being addressed worldwide [4]. Studies using internationally validated criteria-based hospital admission evaluation protocols, such as the Appropriateness Evaluation Protocol [5,6] and the Pediatric Appropriateness Evaluation Protocol (PAEP) [1,2,6–8], have shown that 10–30% of hospital admissions are medically unnecessary [1,2,7–9].

In Israel, every resident is insured under the National Health Insurance Law and is entitled to choose from one of four major health maintenance organizations. Curative primary care is provided mostly in community HMO clinics, while specialist and tertiary care are provided at government, HMO or private medical centers. Pediatric hospital admissions are via the pediatric emergency room, except for scheduled procedures. Patient management in the PER, including the decision to hospitalize, is the sole responsibility of the attending PER physician. Decisions to hospitalize are based on medical conditions and services available in the community as well as on the physical and social circumstances of the family.

This study took place at the Soroka University Medical Center, a 1,000 bed teaching hospital in Beer Sheva, Israel. This hospital is the only tertiary medical center serving the Negev (southern, desert) region of Israel, an area of about 11,000 square kilometers with a population of 456,000 (75% Jewish and 22% Bedouin). The Jewish population lives in urban and communal communities, while most of the Bedouin live in rural settlements. Soroka serves a population of approximately 194,000 children (122,400 Jewish and 66,000 Bedouin) and is essentially the only facility in the Negev that provides around-the-clock pediatric emergency services 365 days a year. Approximately 100 children come daily to the PER and about 20% of these visits result in hospitalization. The number of referrals and the use of the PER at Soroka are increasing due to the growth in the population of the Negev, the increased use of the emergency room as a walk-in clinic, inadequate community healthcare facilities (especially in the Bedouin communities), and inconsistent emergency referral decisions at the community clinic level. This increase in the number of emergency room cases (non-trauma) is expected to be

PAEP = Pediatric Appropriateness Evaluation Protocol

HMO = health maintenance organization

PER = pediatric emergency room

followed by an increase in the number of hospital admissions and inappropriate hospitalizations.

Characteristics of inappropriate hospital admissions, identified through appropriateness evaluation, can serve as indicators of problems in healthcare management and as a basis for improving quality of care and developing appropriate medical decision processes. This study is significant in terms of optimal medical care for children as well as health economics. The purpose of our study was to assess the rate of inappropriate admissions to a tertiary care facility in Israel using an internationally validated evaluation protocol and to analyze the reasons for and characteristics of these inappropriate admissions.

Methods

The study population included all admissions to the pediatric departments of Soroka University Medical Center on 18 randomly selected days in 1993; at least one day in each month and one day of the week. Saturdays and holidays were not included in the study since the PER functions with a reduced staff on these days.

The study was based on a chart review of the study population. A fifth-year Ben-Gurion University medical student collected data from the patient's hospital records, the referral form to the PER, the hospitalization referral form, and the discharge letter from the pediatric department. Each case was evaluated using the PAEP to assess appropriateness of admissions to the pediatric units. A board-certified pediatrician reviewed cases that did not clearly meet the criteria of appropriateness for admission according to the PAEP. Admissions were designated as "appropriate" or "inappropriate."

Results

The hospital records for 221 of the 278 admissions to the pediatric departments on the 18 selected dates were located and included in the study. The numbers vary slightly between variables where data were not available on the forms [Table 1]. Admissions were equally divided among Jewish and Bedouin children. Almost 70% of all the children admitted to the hospital came to the PER with a referral from a primary care provider; 9% were self-referred. Of the children admitted in the study, 42% were less than one year old, 65% were males, and 42% were hospitalized for 2 or less days.

Using the PAEP, 18% of all admissions were evaluated as inappropriate. The reason cited most frequently for evaluating an admission as inappropriate was that the patient could have been treated on an outpatient or ambulatory basis. Gastroenteritis, fever, and respiratory problems accounted for most of the presenting problems in the inappropriate admissions. The inappropriate admission rate was 21% for males and 13% for females, and 12% among children under 1 year of age vs. 23% in children aged 1 or over ($P=0.04$). There was a significant difference ($P=0.04$) between the rate of inappropriate admissions of Jewish children compared with Bedouin children (23% vs. 13%). For hospital stays of 2 or less days, 30% were evaluated as inappropriate compared to only 12.5% for hospital

Table 1. Pediatric hospital admissions according to specified characteristics

Characteristic	Admissions % (N)	% (n/N) of admissions evaluated as inappropriate	P*
Gender			0.13
Male	65 (143)	21 (30/143)	
Female	35 (78)	13 (10/78)	
Total	100 (221)	18 (40/221)	
Age			0.04
0–12 mo	42 (89)	12.4 (11/89)	
> 1 yr	58 (125)	23.2 (29/125)	
Ethnicity			0.04
Jewish	50 (111)	23 (26/111)	
Bedouin	50(110)	13 (14/110)	
Length of stay			0.0005
≤ 2 days	42 (92)	30 (27/92)	
3–8 days	48 (106)	12.5 (13/106)	
> 8 days	10 (22)	0 (0/22)	
Referral status**			0.03
Referral from primary care provider	69 (154)	15 (23/154)	
Self-referred	9 (20)	35 (7/20)	

N = number of cases where information was available for the specified characteristic, n = number of cases evaluated as inappropriate admissions using the PAEP

* By chi square

** Referrals from sources other than primary care provider are not included in the analysis

stays of 3–8 days ($P=0.0005$). All hospital stays of more than 8 days were evaluated as appropriate admissions. Only 15% of admissions that came to the PER with a referral from a primary care provider were inappropriate, compared to 35% that came to the PER without a referral ($P=0.03$).

Of the 40 admissions evaluated as inappropriate, 75% were male, 65% were Jewish, 67% were short hospital stays, 72.5% were children over 1 year of age, and 45% were ordered by junior residents in the PER.

Discussion

Even though the study was done on hospital admissions in 1993, the results have relevance today because the PAEP tool for evaluating the appropriateness of pediatric hospital admissions is still in use in the United States. The results of this study serve as a basis for current studies on patient management in the PER and implementation of hospital admission guidelines in Soroka's PER. Furthermore, the results are relevant to healthcare management and health economics.

We found that inappropriate admissions were associated with hospital stays of 2 or less days, children older than 1 year of age, Jewish children, and self-referred patients. Analysis of these variables can provide information necessary for making changes in healthcare management. These changes have the potential to reduce inappropriate hospital admissions and inappropriate use of healthcare facilities, coupled with improvement of healthcare to the patient.

The rate of 18% inappropriate hospitalizations, demon-

strated in this study at Soroka University Medical Center, is similar to previous studies in other countries [2,4,9]. The reasons for evaluating admissions as inappropriate were also similar, the most frequently cited reason being that the child could have been treated on an outpatient basis [7,9], possibly indicating that ambulatory care and diagnostic services at the community level are not satisfactory. Improvement of these services can have a direct effect on tertiary care utilization.

Two previous studies conducted in Israel on PER referrals from community clinics found that a majority of males (60%) was referred to the PER [10,11]. In the present study 65% of all hospital admissions were male. The male-female ratio in the population of Israel is 1:1. Greater morbidity in boys is one interpretation for the greater referral and hospitalization rate of male children. Another interpretation is that these higher rates reflect a difference in Middle Eastern attitudes of parents and caregivers towards boys and girls. The latter is supported by the fact that 21% of all male admissions were inappropriate compared to only 13% of the female admissions and that 75% of all the inappropriate admissions were male.

Age and length of stay were also related to inappropriate admissions. The group of children under the age of one year had a significantly lower rate of inappropriate admissions than the older group (12% compared with 23%). Children under 1 year old accounted for 42% of all admissions, but for only 27% of the inappropriate admissions. This could indicate more specific practice regulations and less practice variation in the PER for children less than one year old. Length of stay was found to be a significant variable for cases evaluated as inappropriate for admission. It is interesting to note that the rate of inappropriate admissions in hospital stays of 2 or less days (short stays) is significantly higher than in stays of 3 or more days (30% vs. 12.5%, $P < 0.01$). This finding is in agreement with Kemper [1] who found that contrary to expectation, inappropriate use decreased with increased lengths of stay, indicating perhaps that most short-stay admissions could probably have been treated on an outpatient basis or in the community. In support of this thesis, we found that while 42% of all admissions were short hospital stays, these short stays accounted for 67.5% of the inappropriate admissions. These were all evaluated as inappropriate because the patient could have received treatment on an outpatient or ambulatory basis.

The ratio of Jewish children to Bedouin children who came to the PER was 2:1. However, while approximately 50% of the admitted children were Jewish, the rate of inappropriate admissions of the Jewish children was significantly higher than the Bedouin rate (23% vs. 13%, $P < 0.05$) [Table 1]. This finding possibly reflects Bedouin community living conditions, which in most cases validate the necessity of hospitalizing Bedouin children because they often cannot get treatment in their community or be cared for at home.

Of the hospital admissions of patients who came to the PER without a referral 35% were evaluated as inappropriate, compared with 15% of patients who came to the PER with a referral. This supports the current healthcare system in Israel,

which emphasizes the gatekeeping role of primary care physicians. It is interesting to note that 45% of all inappropriate admissions were ordered by junior residents, which is significantly higher ($P < 0.05$) than the percent of inappropriate admissions ordered by board-certified physicians or by senior residents.

This study represents 40 inappropriate hospitalizations. A hospital day at Soroka costs \$375, compared to about \$80 for the cost of treatment at the day-care unit. The cost of a clinic visit is \$20. On an economic level, the 27 inappropriate short-stay hospitalizations alone represent a cost of at least \$10,000.

The question to be addressed is whether the rate of inappropriate admissions can be reduced; and if so, how. Our findings suggest the following approach:

- Patients can be treated in the community or on a day-care basis if the required services are made available. Therefore, target the community and rethink the referral policy, perhaps by implementing referral guidelines to the PER in the community clinic.
- Implement admission guidelines in the PER that reflect risk factors, local conditions and biased thinking in decision making, such as age, gender and ethnicity.
- Develop alternative management of problems that result in short hospital stays.

Acknowledgement. Supported in part by a grant from the Israel Ministry of Health

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