Parental and professional perception of need for emergency admission to hospital: prospective questionnaire based study

R MacFaul, M Stewart, U Werneke, J Taylor-Meek, H E Smith, I J Smith

Abstract

**Aim**—To compare views of parents, consultants, and general practitioners on severity of acute illness and need for admission, and to explore views on alternative services.

**Method**—Prospective questionnaire based study of 887 consecutive emergency paediatric admissions over two separate three week periods in summer and winter of five Yorkshire hospitals, combined with a further questionnaire on a subsample.

**Outcome measures**—Parental scores of need for admission and parent and consultant illness severity scores out of 10. Consultant judgment of need for admission. Alternatives to admission considered by consultants and, for a subsample, by parents and family GP.

**Results**—Ninety nine per cent of parents thought admission was needed. Parents scored need for admission more highly than severity of illness with no association observed between severity and presenting problem or diagnosis. High parental need score was associated with a fit, past illness, and length of stay. Consultant illness severity scores were skewed to the lower range. Consultants considered admission necessary in 71%, especially for children aged over 1 year, presentation with breathing difficulty or fit, and after a longer stay. More admissions in the evening were considered unnecessary as were admissions after longer preadmission illness, gastroenteritis, or upper respiratory tract infection. Of a subsample of parents, 81% preferred admission during the acute stage of illness even if home nursing had been available. Similar responses were obtained from GPs. Alternative services could have avoided admission for 19% of children, saving 15.6% of bed days used.

**Conclusions**—Medical professionals and parents differ in their views about admission for acute illnesses. More information is needed on children not admitted. Alternative services should take account of patterns of illness and should be acceptable to parents and professionals; cost savings may be marginal.

The Court Report in 1976 recommended that “whenever the illness and circumstances allow a child will be cared for at home”. Adhering to this recommendation one might have expected to see a downward trend in paediatric admissions. Instead, the subsequent period has been characterised by steadily rising admission rates from 21/1000 children in 1975 to 51/1000 in 1993. The reasons for this increased use of inpatient paediatric resources are not well understood, and routinely collected data provide little understanding of the events surrounding admission. The discharge diagnosis is routinely recorded but does not reflect the clinical picture, parental concerns, social circumstances, or why hospital care was considered necessary. For example, an infant discharged with the apparently simple diagnosis of “a cold” may have been admitted because of suspicion of serious infection and required several investigations and a range of observations to exclude a diagnosis of meningitis or other significant illness. A paucity of information exists on the severity of illness and parental, general practitioner (GP), and consultant views about the need for admission. This study aimed to examine the severity of illnesses found in children admitted as paediatric emergencies and to assess the need for admission as judged by parents and the consultant in charge. It was part of a larger study to examine acute medical paediatric admissions and their appropriateness.

**Methods**

All emergency general paediatric admissions (n = 887) during two separate three week periods, one in summer and one in winter, were sampled in five hospitals in Yorkshire. Further details of the study design and medical and social characteristics of the study population are reported in an accompanying paper.

Questionnaires were completed at admission by parent and admitting senior house officer and by consultant paediatrician after the child had left hospital. Demographic and clinical data collected included age, sex, postcode, time and route of admission, and nature and duration of presenting problem. Parents were asked to record their perception of the severity of their child’s illness and need for admission on visual analogue scales of 0 to 10. A score of 9 or more was arbitrarily considered to be a high score. After the child’s discharge the consultant recorded overall severity of illness on a similar scale, and need for admission as a simple yes/no opinion. Consultants were also asked to record the reason why they felt admission was needed.
and what alternative services, if available, might have prevented the admission.

For a randomly selected subsample of 123 admissions the views of parents and GPs on alternatives to admission were sought two weeks after discharge using a postal questionnaire. A series of questions requested answers on a visual analogue scale with a free text section inviting comments.

The data were described using frequency distributions. Spearman rank correlation and paired t test were applied to assess the relation between the scores given by the parents for severity of illness and need for admission. Factors influencing the consultant judgment on need for admission were examined using univariate and multivariate analysis, the procedures for which we have described previously.1

Results
There were 887 admissions during the study periods. The general characteristics of the sample are described in detail elsewhere.1 Data collections were incomplete to a variable extent in individual children. In summary, however, 64% were aged 3 years or under, with a median age of 1.9 years, 67% were admitted after referral by GP, and 32% after self referral to an accident and emergency department, 53% of admissions took place between 18:00 and 08:00. The most common presenting problems were breathing difficulty (24%), fit (16%), and feverish illness (15%); and the most frequent discharge diagnoses were upper respiratory tract infection (15%), gastroenteritis (10%), febrile convulsion (8%), and asthma (8%). Stay in hospital was < 24 hours in 24% of children and 61% spent one night or less in hospital.

PARENTAL VIEWS ON NEED FOR ADMISSION AND ILLNESS SEVERITY.
A total of 605 (68%) parents completed the section on illness severity and 588 (66%) on need for admission. Missing data were distributed without significance across the hospitals and diagnoses. Parental assessment of the severity of their child’s illness showed a mean (SD) score of 4.2 (2.1) (fig 1). There was no relation between severity score and presenting problem, diagnosis, socioeconomic status, or other factors. In contrast with the normal distribution of severity illness scores, the parental need for admission scores were highly skewed to the left, with one third (198/588) of the parents scoring 9 or above (fig 2). A total of 29 (5%) gave a need score of < 1 but only two parents thought there was no need for admission.

A fit and parental recall of past illness were associated with a high parental need for admission score while admissions after ingestion of potentially toxic substances were not (table 1). There was no association between parental need score and age of child, time or route of admission (GP or self referral to accident and emergency department), or socioeconomic status. High need score was positively associated with a length of stay > 24 hours (OR 1.77; 95% CI 1.11 to 2.84; p < 0.05). Severity of illness and need for admission were only moderately correlated (r = 0.31), and parents scored need for admission significantly higher than severity of illness (p < 0.001). When parental illness severity score was introduced into the model as a continuous (unfactored) variable, it remained the only significant variable.

CONSULTANTS VIEWS ON NEED AND SEVERITY SCORE
Binary (yes/no) judgments were available for 695 (78%) admissions. Consultants considered that admission was necessary in 491 (71%) of these children. In 447 children (64%) this was for inpatient observation, investigation, or treatment facilities. In 17 children (2%) an admission was necessitated by the lack of appropriate outpatient or community facilities, and in 12 children (2%) admission was required because of social factors alone. A diagnosis of asthma or lower respiratory tract infection, low socioeconomic status, or admission after self referral to accident and emergency department, were positively related to need for admission. However, these factors did not remain significant in multivariate analysis (table 2). This showed significant increased need in children > 1 year old, length of stay > 24 hours, and presentation with breathing difficulty or fit. Less likely to be needed were admission in the evening, preadmission illness > 24 hours, and discharge diagnosis of

<table>
<thead>
<tr>
<th>Variable</th>
<th>Univariate analysis</th>
<th>Logistic regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
<td>95% CI</td>
</tr>
<tr>
<td>Past illness</td>
<td>1.81*</td>
<td>1.25 to 2.63</td>
</tr>
<tr>
<td>Presenting problem</td>
<td>2.19*</td>
<td>1.41 to 3.39</td>
</tr>
<tr>
<td>Fit</td>
<td>0.28*</td>
<td>0.08 to 0.96</td>
</tr>
</tbody>
</table>

Logistic regression is adjusted for variables in univariate analysis p < 0.1 (age, Carstairs score, past illness, associated problem, presenting problem, and hospital).

*p < 0.05.
gastroenteritis, upper respiratory tract infection, or gut disorder (which included gastrooesophageal reflux, unspecified vomiting, chronic diarrhoea, and failure to thrive).

Consultant severity of illness scores out of 10 were skewed to the right with a mean score of 2.6, a median score of 1.9, and only 10% of scores exceeded 6 (fig 3). Consultant assessment of need for admission was related to their assessment of severity, with a mean (SD) severity score of 2.9 (2.37) when admission was needed and 1.1 (0.93) when not (p<0.0001). There were no differences among hospitals for the consultant need ratings according to diagnosis, age, and length of stay.

ALTERNATIVE ARRANGEMENTS FOR CARE

Parental views
Sixty-eight (55%) of the 123 parents contacted after discharge responded to the postal questionnaire. The response rate from parents who had self referred to an accident and emergency department (14 out of 33; 39%) was lower than from parents whose GP had made the referral to hospital (54 out of 90; 60%). In response to suggestions about possible alternatives to admission, such as home nursing care for the child, 81% felt admission would still be needed and 88% expressed a preference for their child to be in hospital until the acute stage of the illness had passed (table 3). Parents views about admission were expressed in 51 (75%) of returned questionnaires and a selection are shown (box). Negative comments were made in only four instances and related to accommodation in two, and the need for admission was questioned in one child with diabetes and another with recurrent asthma.

GP views
A total of 106 (86%) of the 123 GPs contacted by postal questionnaire responded. The responses included 28 of the 33 (85%) admissions after self referral via an accident and emergency department and 78 of the 90 (87%) after GP admission. The GPs judged 88% of admissions to be necessary. Additional services such as children’s nurses calling into the home were not considered to be helpful to the GP and most preferred the child to be in hospital during the acute phase of the illness (table 4).

Consultant responses
For all admissions the consultant was asked after patient discharge what alternative services might have prevented the admission (table 5). Consultants suggested that alternative specialist services such as outreach or day case provision could have prevented admission in 19% of children. For the 689 admissions for whom information was available a total of 1985 bed days were used. If the alternative services suggested had been available locally and all 19% of admissions could have been avoided, it would have resulted in a saving of 309 bed days (15.6%).

Table 2 Medical and sociodemographic variables associated with need for admission as judged by consultants (n = 695)

<table>
<thead>
<tr>
<th>Judged needed (%)</th>
<th>Univariate analysis</th>
<th>Logistic regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio 95% CI</td>
<td>Odds ratio 95% CI</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 1 year</td>
<td>Baseline</td>
<td>Baseline</td>
</tr>
<tr>
<td>&gt; 1 year and ≤ 3 years</td>
<td>1.60* 1.07 to 2.38</td>
<td>2.42† 1.22 to 4.81</td>
</tr>
<tr>
<td>&gt; 3 years</td>
<td>2.43‡ 1.62 to 3.65</td>
<td>2.72‡ 1.38 to 5.37</td>
</tr>
<tr>
<td>Admission time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day</td>
<td>Baseline</td>
<td>Baseline</td>
</tr>
<tr>
<td>Evening</td>
<td>0.62* 0.42 to 0.93</td>
<td>0.54‡ 0.29 to 1.00</td>
</tr>
<tr>
<td>Night</td>
<td>0.91 0.58 to 1.42</td>
<td>1.33 0.62 to 0.87</td>
</tr>
<tr>
<td>Length of stay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 24 hours</td>
<td>Baseline</td>
<td>Baseline</td>
</tr>
<tr>
<td>&gt; 24 hours</td>
<td>2.37† 1.64 to 3.42</td>
<td>7.62‡ 3.76 to 15.46</td>
</tr>
<tr>
<td>Time ill before presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 6 hours</td>
<td>Baseline</td>
<td>Baseline</td>
</tr>
<tr>
<td>&gt; 6 hours and ≤ 24 hours</td>
<td>0.94 0.51 to 1.73</td>
<td>1.17 0.44 to 3.12</td>
</tr>
<tr>
<td>&gt; 24 hours</td>
<td>0.36‡ 0.23 to 0.56</td>
<td>0.49* 0.25 to 0.98</td>
</tr>
<tr>
<td>Presenting problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breathing difficulty</td>
<td>1.91† 1.25 to 2.94</td>
<td>2.81† 1.39 to 5.66</td>
</tr>
<tr>
<td>Fit</td>
<td>3.81† 2.13 to 6.84</td>
<td>5.07† 1.96 to 13.07</td>
</tr>
<tr>
<td>Discharge diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>URTI</td>
<td>0.27† 0.18 to 0.41</td>
<td>0.21† 0.10 to 0.44</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>0.33† 0.20 to 0.53</td>
<td>0.44* 0.20 to 0.97</td>
</tr>
<tr>
<td>Gut disorder</td>
<td>0.56 0.28 to 1.12</td>
<td>0.32† 0.15 to 0.94</td>
</tr>
</tbody>
</table>

Logistic regression is adjusted for variables on which information was available at discharge with p < 0.1 in univariate analysis. *p < 0.05; †p < 0.01; ‡p = 0.05.

URTI, upper respiratory tract infection.

Figure 3 Consultant score for severity of illness during admission.

![Figure 3](http://adc.bmj.com/)

SD = 2.28
Mean = 2.67
n = 688

Table 3 Parental responses to alternative models of care

<table>
<thead>
<tr>
<th>Models of care</th>
<th>GP admission (n = 54)</th>
<th>A&amp;E admission (n = 14)</th>
<th>Total (n = 68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission necessary</td>
<td>80%</td>
<td>86%</td>
<td>81%</td>
</tr>
<tr>
<td>Would have been happy to take child home after been at hospital</td>
<td>11%</td>
<td>0%</td>
<td>9%</td>
</tr>
<tr>
<td>Prefer to care for child at home with nursing or other help</td>
<td>15%</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td>Prefer to care for child at home with nursing or other help after acute period passed</td>
<td>48%</td>
<td>71%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Categories were not mutually exclusive.
Table 4 Responses to questionnaire sent to general practitioners (n = 78)

<table>
<thead>
<tr>
<th>Question</th>
<th>Admitted via</th>
<th>Total</th>
<th>Yes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you feel child’s admission was necessary?</td>
<td>A&amp;E</td>
<td>20/28</td>
<td>71.4</td>
</tr>
<tr>
<td></td>
<td>GP</td>
<td>63/66</td>
<td>95.5</td>
</tr>
<tr>
<td>If preventable admission, would you have preferred to care for child at home with—for example, children’s nurse visiting during acute period?</td>
<td>A&amp;E</td>
<td>9/29</td>
<td>28.6</td>
</tr>
<tr>
<td></td>
<td>GP</td>
<td>13/78</td>
<td>16.7</td>
</tr>
<tr>
<td>If preventable admission, would you have preferred to care for child at home with—for example, children’s nurse visiting after acute period?</td>
<td>A&amp;E</td>
<td>7/28</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>GP</td>
<td>33/78</td>
<td>42.3</td>
</tr>
</tbody>
</table>

Sample size varies with differing numbers of responses to individual questions.

Table 5 Consultant views on alternative services that might have prevented admission

<table>
<thead>
<tr>
<th>Service provision</th>
<th>Level</th>
<th>Admissions (n = 689) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;E facility</td>
<td>Primary</td>
<td>4 (0.6)</td>
</tr>
<tr>
<td>General practitioner</td>
<td>Primary</td>
<td>77 (11.2)</td>
</tr>
<tr>
<td>Social service</td>
<td>Primary</td>
<td>10 (1.5)</td>
</tr>
<tr>
<td>Health visitor</td>
<td>Primary</td>
<td>1 (0.2)</td>
</tr>
<tr>
<td>All primary care</td>
<td></td>
<td>92 (13.5)</td>
</tr>
<tr>
<td>Outpatient or day case facility</td>
<td>Secondary</td>
<td>77 (11.2)*</td>
</tr>
<tr>
<td>Outreach</td>
<td>Secondary</td>
<td>46 (6.7)</td>
</tr>
<tr>
<td>Community paediatrician</td>
<td>Secondary</td>
<td>2 (0.3)</td>
</tr>
<tr>
<td>All secondary care</td>
<td></td>
<td>125 (18.2)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>217 (31.7)</td>
</tr>
</tbody>
</table>

*26 of 77 where day case or outpatient care was suggested were admitted at night.

Discussion

Most children had mild illnesses, were admitted for short periods of time, and required observation rather than treatment. Despite this, most acute medical admissions were felt to be necessary both by parents at the time of admission and by the consultant at discharge. Additional data collected two weeks after discharge from a sample of GPs and parents confirmed that a period of inpatient care was the preferred management in those who responded. These views were expressed without experience of alternative services, but they need to be considered when proposing and studying alternatives to admission.

Consultant subjective (implicit) judgment of need for admission was made after discharge and is influenced by benefit of hindsight. Seventy one per cent of admissions were judged to be necessary even though illnesses were usually not severe, which suggests factors other than illness severity influenced the opinion. Consultants perceived need for admission was greater in children presenting with a fit or breathing difficulty. Presenting problem outweighed the discharge diagnosis, although both were closely related. Recognition of uncertainty of outcome at the time of presentation in acute illness is a more important predictor of need for admission. Thus data on presenting complaints, as well as discharge diagnosis, should routinely be recorded. Studies are needed on consultant opinion of need for admission at the time of presentation.

Consultants view on need for admission was rated equally frequently whether a child was admitted after GP referral or after self referral to an accident and emergency department. Length of stay was longer when parents had judged need for admission to be high. Both observations suggest that parent assessment of need for hospital attention is at least as valid as that of the GP although we do not know what proportion of accident and emergency attenders were not admitted compared with GP consultations—an aspect that requires further study. Peak time for admissions was in the evening and although, apart from breathing difficulty, the nature of illnesses did not differ in the evening, they were less likely to be judged as necessary by consultants. These findings suggest that doctors lower their threshold for admission in the evening and at night. Admission was also less likely to be considered necessary for gastroenteritis, upper respiratory tract infection, and gut disorders, and for illnesses of longer duration before admission. Provision of evening assessment and same day paediatric consultation clinics supported by outreach paediatric nursing, preferably as a 24 hour service, could potentially reduce admission for these children and for those with chronic disorders, present in 13% of our study population. *  Consultant

Examples of parental perceived benefits of admission

- I was very pleased she was kept in overnight to be kept an eye on. Although she was not seriously ill, it put my mind at rest
- The admission was as unstressful as it was possible to be, particularly because I was able to stay the night with X. The staff made every effort to make things easier, particularly in the accident and emergency and the x ray departments
- We felt much happier about our son’s condition when all the investigations had been done in hospital and would have been happy to take him home then, but were accepting of their advice to admit him
- Both myself and my daughter managed a decent night’s sleep which we had not had for a couple of days. Just one night in a hospital and P was a lot better
- I thought my son’s admission to hospital was necessary not only for him but also for myself. It stopped me from panicking as I knew help was just outside the door. When I calmed down the doctors knew I wanted to go home and let me, so I needed no extra help because I was reassured that he was fine and just needed an eye kept on him
- I was frightened at home, but felt very secure in hospital with her being constantly monitored. I was allowed home as soon as I requested, which was as soon as I felt able to cope with her condition
- I felt that the nurses had more experience of a temperature that wouldn’t drop because of convulsion. She also wasn’t drinking or eating. Once her temperature dropped she started to eat and drink. This made us all happier
Perception of need for emergency admission to hospital

217

Parents—a view appreciated by consultants.9

extremely frightening experience for

studies have identified a fit in their child as an

perception of need for admission. Other

serious illness were found to influence parental

problems and parental record of previous

after admission.

be at their most concerned. However, results

were similar from the responders to the ques-

naire sent to a small subsample two weeks

after admission.

In multivariate analysis, fit as a presenting

problem and parental record of previous

serious illness were found to influence parental

perception of need for admission. Other

studies have identified a fit in their child as an

extremely frightening experience for

parents—a view appreciated by consultants.9

Guidelines for referral and management of fit

need to take these experiences into account.

On the other hand, ingestion—a condition with

potentially severe or even fatal consequences—

was inversely associated with high parental

need score, suggesting that effective health

education is lacking in this area. Parents and

consultants record and perception of previous

serious illness differed, and the way in which

one illness is managed may influence how par-

ents perceive and respond to subsequent illness

with hospital care possibly leading to repeated

“use”.10

For acutely ill children, hospitals should

provide a level of care for children and their

families that cannot safely be delivered at

home. The aim of many ambulatory or

outreach services is to avoid overnight inpa-

tent admission. Our findings emphasise the

need for clear evidence that this approach is

desirable, safe, and acceptable for children

with acute illnesses. Parents view in the sam-

e showed that they valued close observation

by hospital staff (especially at night), access to

investigations, or a period of respite (box).11

Improved “out of hours facilities”, appear to

be needed with resources at a comparable

level, if not greater, than those in place during

the day. The views of GPs were aligned with

those of parents and they did not perceive a

need for nursing care at home during the peak

of the illness although this type of service has

been found to be helpful for selected prob-

lems.1 However, neither parents nor GPs had

experience of a home nursing service. Care

delivered in the home is likely to be

expensive. Resources released by a reduction

in a few beds are unlikely to meet the costs. In

Australia, a children’s emergency observation

annexe led to a reduction of inpatient bed
days.12 Although no detail was given, signifi-
cant financial savings were implied and similar

results were reported from a development in

York.13 Alternatives to admission may not be

practical. In our study consultants proposed

outpatient or day case provision as an alterna-

tive for 77 children but these would not have

been applicable to the one third of them who

presented at night. Even if admission had been

avoided for all 77 children, at most 15.5% of

bed days would have been saved.

Possible detrimental effects of a short term

hospital admission must be taken into account.

These include risk of cross infection and upset
to child and parent resulting from painful and

possibly unnecessary procedures. These must

be balanced against the cost to the parent of

care at home in terms of anxiety (especially out

of hours) and potential adverse clinical out-

come. Although studies in the 1960s found that

a hospital stay could have adverse psychologi-
cal and behavioural effects on children and

their families,14 there is little recent evidence.

Improved conditions within hospitals with

greater involvement of the parents, availability

of children’s wards, and specialist staff are

likely to have minimised the negative psycho-

logical impact of admission to hospital. Con-

temporary studies of effects of admission are

required. Increasing demand for admission

from parents and GPs and the positive views

expressed by them in this study imply that

admission is an acceptable and welcome

solution to acute illness in some children. Our

efforts should be directed to refining the

indications for admission for common disor-

ders and, when inpatient care proves necessary,

making the admission as easy, stress free, and

short as possible.

Our results provide some insight into views of

parents, GPs, and consultant paediatricians on

the necessity and severity of paediatric

medical emergency admissions. Though not

entirely congruent with each other, there are

many similarities. Our findings have significant

implications for future development of paedi-

atric services, which should take account of

the views and needs of parents.

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