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## PREHOSPITAL CARE

## Prehospital use of paracetamol among children attending the accident and emergency department

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**Objectives:** To identify patterns of prehospital administration of paracetamol to children who were perceived to be feverish by their carers.

**Methods:** A prospective cohort study of carers of children attending a paediatric accident and emergency (A&E) department. Carers of children completed a questionnaire to identify domestic patterns of paracetamol use. Data were collected on temperature of the child in the A&E department, administration of antipyretics in the A&E department, diagnosis, and disposal from the A&E department.

**Results:** Seventy five adults attending the A&E department consented to involvement. Sixty five of the children were feverish on arrival in the A&E department. Twenty one children (32.3%) had not received paracetamol before attending. There was a significant relation between knowledge of the antipyretic properties of paracetamol and administration ( $\chi^2=5.0$ ,  $p<0.05$ ). There was a significant correlation between fever and administration of paracetamol in the A&E department ( $\chi^2=23.7$ ,  $p<0.01$ ), however, 15 feverish patients (24.6%) were not treated.

**Conclusions:** Most carers administer paracetamol appropriately in the prehospital setting. Administration correlates significantly with knowledge of its benefits. There is scope for education of carers and A&E department staff in the appropriate use of antipyretics such as paracetamol.

The beneficial properties of paracetamol as an antipyretic are well reported.<sup>1,2</sup> Singhi found that 57% of parents used paracetamol, but 63% thought they should consult a doctor before starting treatment.<sup>3</sup> Blumenthal<sup>4</sup> found the most parents did not know what a normal temperature was, and believed that untreated fever caused brain damage. Al-Eissa<sup>5</sup> highlighted the inability of parents to appropriately administer the correct dose of antipyretic. Kinmonth<sup>6</sup> showed that parents found advice to give paracetamol more acceptable than advice to sponge or unwrap their child. This study aimed to determine the prehospital use of paracetamol among carers presenting with unwell children to a paediatric accident and emergency (A&E) department. In addition, once found to be feverish in the A&E department, to record the subsequent administration of antipyretics by staff.

## METHODS

### Setting

The A&E department at Sheffield Children's Hospital serves an urban catchment area covering Sheffield and about 40 000 children under 16 years attend annually. Children are triaged on arrival by a nurse who can prescribe paracetamol or ibuprofen. Indications for administration include temperature  $>37.4^\circ\text{C}$  and pain.

### Inclusion and exclusion criteria

Inclusion criteria were consecutive adults attending with children ( $<16$  years) presenting to the A&E department during June 1998 with an illness perceived by the carer to include fever. Non-English speaking adults were excluded.

### Design

Seventy five adults accompanying children were invited to participate. No adult refused. Adults completed a questionnaire (see journal web site) in the A&E department. Children had their temperature recorded by the triage nurse using a Genius aural thermometer. Feverish children (temperature  $>37.4^\circ\text{C}$ ) were prescribed either paracetamol or ibuprofen if appropriate. Patients were managed by the A&E department

doctor and temperature monitored routinely. The A&E department notes were reviewed to record: antipyretic administration, effect on temperature, diagnosis, and disposal from the A&E department.

### Data handling

Data were entered onto a database and analysed using the SPSS for Windows Version 6.1. Data compared differences in prehospital paracetamol administration using  $\chi^2$ , Fisher's exact tests or *t* tests. A level of  $p<0.05$  was taken as being significant.

## RESULTS

Seventy five carers of children presenting to the A&E department completed questionnaires correctly. The male:female ratio was 1.6:1.0, with an age range (median) of 3 months to 13 years (2 years).

On presentation, 65 of the 75 children were still feverish (86.7%). There was no difference between the mean ages of those feverish and non-feverish children (3.2 years (SD=3.9) compared with 2.7 years (SD=2.9),  $t(73)=0.44$ ,  $p=0.66$ ). Twenty one (32.3%) children had not received paracetamol before attending, all but one was feverish at presentation. There was no difference in mean age between those who received paracetamol before presentation and those who did not (2.6 years (SD=2.7) compared with 3.5 years (SD=3.9),  $t(73)=1.2$ ,  $p=0.23$ ).

Table 1 summarises the reasons for not administering paracetamol.

### Knowledge of administration

There was a significant correlation between knowledge of paracetamol use (see questionnaire on web site (item 4)) and prehospital administration ( $\chi^2=5.0$ ,  $p<0.05$ ). Most carers knew that paracetamol could be given four to six hourly ( $n=60$ , 80%). Of those who had administered paracetamol, 61.1% ( $n=33$ ) had given the correct dose. Most had used Calpol ( $n=23$ , 42.6%), but 14 were unable to state what

**Table 1** Reason for non-administration of paracetamol prehospital

Reason for non-administration	Feverish group n (%) n=19
Unaware of benefits/didn't think to use it	4 (21.1)
None in household	2 (10.5)
Child vomiting/refused	4 (21.1)
No parents present	4 (21.1)
Want to check with doctor/unsure about giving	2 (10.5)
Other	3 (15.8)

**Table 2** Diagnosis given in the A&E department

Discharge diagnosis from A&E department	Frequency (%) n=75
Asthma/wheeze	2 (2.7)
Wound infection	3 (4.0)
URTI	38 (50.7)
Febrile convulsion/viral infection	11 (14.7)
Gastrointestinal	4 (5.3)
Sepsis	2 (2.7)
Tonsillitis	5 (6.7)
Other	10 (13.3)

preparation they had used (25.9%). The remainder had used a combination of other paracetamol preparations.

### Resolution of fever

Of the 65 feverish children, 21 (32.3%) had not been given prehospital paracetamol. Fifty (66.6%) children were subsequently given antipyretics in the A&E department. A further 15 (24.6%) patients were feverish, but no action was taken by A&E department staff. There was a significant correlation between fever and antipyretic administration ( $\chi^2=23.7$ ,  $p<0.01$ ). Most ( $n=28$ , 56.0%) received paracetamol, the rest received ibuprofen ( $n=13$ , 26.0%) or a combination of paracetamol and ibuprofen ( $n=9$ , 18.0%). Of the feverish patients attending, all but one had resolution after antipyretic administration and a period of observation in the A&E department.

### Diagnoses and disposal

Table 2 shows the distribution of discharge diagnoses. Twelve (16.0%) patients were admitted. There was no correlation between administration of paracetamol at any time and disposal (Fisher's exact test,  $p=0.49$ ).

### DISCUSSION

Most carers seem to administer paracetamol appropriately for a perceived feverish illness. However, there is scope for education of carers in the benefits of paracetamol and other antipyretics. These findings are echoed by previous studies, which identified a shortfall in knowledge about fever and antipyretic administration.<sup>3-5</sup> Blumenthal<sup>4</sup> stated that improving parental perceptions of the dangers of fever and the use of antipyretics might avoid consultations. Some children were noted to be feverish at triage, but did not receive antipyretics. Given that the evidence for the benefits of antipyretics exists, failure to administer it is a training issue. Although not recorded here, the use of antipyretics may expedite transit time in the A&E department. Thomas<sup>7</sup> conducted a national survey of A&E department nurses, and found that most nurses used tepid sponging, administration of antipyretics or both to reduce temperatures. All but one child had a resolution of their fever in the A&E department. It is not possible to determine

whether the period of observation or administration of antipyretics was the most beneficial. Further work to investigate this relation is required.

There is some evidence for the presence of a fever benefiting host defence mechanisms.<sup>8</sup> Some authors advise against the use of antipyretics stating that fevers are not harmful, but drugs have potential harmful side effects.<sup>9</sup> However, given that carers perceive fevers to be associated with morbidity,<sup>5</sup> it may provoke less anxiety and promote carer confidence in managing minor self limiting paediatric illnesses.<sup>10</sup>

### Study limitations

Carers attending the A&E department with children who are unwell are a self selected population, which means that these data may not be generalisable to the population as a whole. There may be differences in knowledge of the management of an ill child in our population when compared with a primary care population. The small sample size may lead to some clinically significant effects not reaching statistical significance.

In conclusion, this study has shown that most carers of children are aware of the benefits of using paracetamol for fevers. This knowledge increases the likelihood that paracetamol will be administered. Significantly more children presenting with a perceived feverish illness who had been pretreated were afebrile on arrival in the A&E department. Paracetamol use did not influence the decision to admit or discharge patients from the A&E department. Education of carers and A&E department staff should be ongoing to improve knowledge of the benefits of antipyretics.

### Contributors

SM formulated the idea for this study. SM and ST designed the study. ST collected the data and developed the database. ST, SM, and DB analysed the data and wrote the paper. SM will act as guarantor for the paper.

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Additional information regarding this paper is available on the journal web site ([emjonline.com](http://emjonline.com))

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