The Nursing Management of Fever in Children

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Executive Summary

Objectives

The objective of this review was to determine whether the best available evidence supports the types and timing of the various nursing interventions which are commonly used to reduce fever in non-critically ill children, and whether and to what extent the outcomes are influenced by these nursing interventions. The review also provides a narrative summary of the issues raised by incorporating these interventions into the nursing management of fever in non-critically ill children.

Inclusion Criteria

Types of participants

Non-critically ill children aged between 3 months and 16 years of age with fever, i.e. a temperature ranging from 37.5°C (tympanic or oral)/ 38°C (rectal) to 41°C.

Exclusions

Critically ill children/infants with fever.

Types of intervention

All interventions aimed at reducing fever that fall within the practice of nursing were included. The categories of intervention identified were:

- Administration of antipyretic medication
- Maintenance of hydration
- Use of external cooling measures - direct and environmental interventions are considered

Types of outcome measures

Outcomes of nursing interventions of interest were:

- Effect on fever, e.g. reduction, prevention of increase
- Prevention of febrile convulsions
- Increased comfort, e.g. decreased irritability
- Decreased parental anxiety
Types of research designs

This review considered any randomised or quasi-randomised trials that addressed the effectiveness of interventions which are used to reduce fever in non-critically ill children.

Search Strategy

The search sought to identify both published and unpublished studies in the English language between 1988 and 1998. Published studies before 1988 were also included.

A variety of scholarly electronic databases were searched using accepted search techniques, and included CINAHL, MEDLINE, Embase, Expanded Academic Index, Current Contents and the Cochrane Library.

Assessment of Quality

Quality assessment was undertaken by pairs of independent reviewers drawn from the Review Panel. Authorship of journal articles was not concealed from the reviewers. Methodological quality of studies that met the inclusion criteria was assessed by two reviewers using a developed checklist. Disagreements between reviewers were resolved by discussion with a third reviewer.

Data Extraction and Analysis

A data extraction form was developed and pilot tested. The major categories of data extracted were: study methods, participant characteristics, interventions and outcomes. Two reviewers independently extracted the required data. In the case of disagreement, a third reviewer would extract data and then resolve any differences by discussion.

Although all studies were randomised, heterogeneity precluded a meta analysis being conducted. There was considerable variation between studies in respect to study settings, interventions and measurement of outcomes. In addition, the data required to conduct a meta analysis were not available in sufficient studies within subgroups. Instead narrative comparisons are provided on one outcome measure only: effect on fever. Given the lack of statistical analysis, the results of these comparisons should be interpreted with caution.
Results

Ten studies met the inclusion criteria, one of which was unpublished. All were assessed as meeting the minimum quality standard. With the removal of subgroups that received interventions that are no longer used (aspirin, and sponges using ice water or alcohol), the total number of children included in the 10 studies was 821.

The review provided information on the effectiveness of two of the three categories of interventions - administration of antipyretics and direct cooling measures - on only one of the four outcome measures identified in the review protocol - reduction of or prevention of increase in fever.

For the other three outcomes - prevention of febrile convulsions, increased comfort and decreased parental anxiety - there was either insufficient or no evidence available on which to base conclusions.

The results suggest that there is little if any benefit from sponging in temperate climates. Only small decreases in temperature are achieved often at the expense of the child’s comfort. However in certain circumstances, for example high environmental temperatures and humidity, or in situations where there is a need for immediate temperature reduction, sponging may be warranted.

The risks of administering antipyretics on a sustained basis over even a short period of time and above a relatively low total daily dosage has been identified. In addition, there is a lack of evidence in the literature that administering antipyretics reduces the incidence of febrile convulsions.

The one study that addressed parental care indicated the need for parental education that focuses on knowledge of the body's protective physiological responses and how to support those responses.

Implications for Practice

The essential question that needs to be asked is: ‘Should one intervene?’ The answer will vary depending on which intervention is being considered. Uncomplicated fever is relatively harmless but an important immunological defence mechanism. Any intervention that supports the body's beneficial physiological responses to infection should be used. Actions such as encouraging fluids, removing excess clothing or wrappings and ensuring circulating air fall into this category. Parental education is also supported in order to increase their knowledge and skills in caring for their febrile child and to decrease any anxiety.
The use of other interventions needs to be carefully considered. The purpose of intervening should be clearly identified. The primary purpose is to increase the child's comfort (or decrease their discomfort). Another aim might be to reduce parental anxiety. These considerations should be balanced against any harm that might result from intervening, for example increasing the child's discomfort or placing the child at risk of liver damage.

There is a lack of evidence to support the routine use of sponging in temperate climates/environments. Sponging does not produce a sustained effect in reducing temperature. In addition there is a significant risk of increasing discomfort, which in turn may raise the child’s temperature. In addition there are the economic considerations of using nursing time to carry out ineffective interventions. However, there may well be individual situations where a case can be made for sponging/bathing a child, provided the child does not become upset and/or show other signs of discomfort e.g. shivering.

The administration of antipyretics should also be used selectively and with caution. Despite the comparative safety of acetaminophen (paracetamol), routine sustained administration for the treatment of fever is not supported. Care also needs to be taken in ensuring parents understand the correct dose to administer as there are documented cases of hepatotoxicity in children resulting from accidental overdose due to parental error (Heubi, Barbacci & Zimmerman, 1998).

In summary, care needs to be individualised, based on current knowledge of the effectiveness and risks of interventions.