

A study of treatment patterns in symptomatic management of fever in children (antipyresis) among Pediatricians

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Abstract

Background: Fever is an extremely common sign in pediatric patients and the most common cause for a child to be taken to the doctor. There are no guidelines or consensus in India about symptomatic management of fever and hence there can be too many misconceptions and conflicting results about fever management. **Aims:** In this study the aim was to identify knowledge gaps of primary care doctors regarding fever in children. **Methods:** This cross-sectional study was conducted from August 2019 –October 2019 involving Pediatricians and family physicians (n=935). A questionnaire was administered to convenient samples of pediatricians and family physicians eliciting information about fever definition, methods of temperature measurement, and antipyretic use. Differences in responses between the doctors were evaluated. **Results:** The data was analyzed using the SPSS 16.0 program and descriptive statistics were used. In the present study 40% of the doctors knew that a body temperature of above 37.5°C according to an axillary measurement is defined as fever. Only 36% of the doctors took into consideration signs and symptoms other than fever to prescribe antipyretics. Almost 85% of the doctors prescribed antipyretics to control fever or prevent complications of fever especially febrile seizures. Most of the doctors (76.3%) in this study reported that the intensity of fever may be used as an indicator for severe bacterial infection. A great majority of doctors (65.3%) stated that they advised parents to alternate the use of ibuprofen and paracetamol. **Conclusions:** There were significant misconceptions about the management and complications of fever. There is a perceived need to improve the recognition, assessment, and management of fever with regards to underlying illnesses in children and a national consensus statement on fever and antipyresis in children.

Keywords: Antipyresis; Fever phobia; Pediatricians; India

Introduction

Fever is the most common cause for a child to be taken to the primary doctor, but the approach to the management of this sign varies significantly among pediatricians and primary care physicians [1]. Guidelines for symptomatic management of a febrile child have been published in many Western countries but the gap between available evidence and clinical practice seems still to be significant and poor adherence to the guideline recommendations has been reported. For a very longtime now, the beneficial effects of a febrile response have been known. [1,2,3,4] A few times, the health providers reinforce this fever phobia by their incomplete and insensible messages to parents. In a few studies, many primary care doctors and even Pediatricians believed that fever is dangerous and cause brain damage and febrile convulsions [5,6,7,8].

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Although fever has beneficial effects and is good for the immune response, it seems that the negative perceptions of fever, like fears of febrile seizures and fever phobia, remain unchanged [9,10]. The health care providers continue to reduce low grade fever without other symptoms and recommend various kinds of antipyretics to feverish children. In brief, these misconceptions cause unnecessarily aggressive and inappropriate management of feverish children [7].

Nevertheless, there are also conflicting results about fever management in the literature and these conflicts may also contribute to doctors' misconceptions.

Hence, in the present study was aimed to identify the knowledge gaps and misconceptions of doctors regarding fever in children in our part of the world.

Subjects and Methods

Settings and type of study- This cross-sectional study was conducted between August 2019–October 2019 involving doctors who had assembled during meetings, local CMEs and conferences in Karnataka State, India.

Sampling methods, Inclusion and exclusion criteria- All subjects were interviewed by the use of a standardized self-administered questionnaire, designed on the basis of the recent United States and NICE (United Kingdom) guidelines for the management of fever in children [1,3,4]. Data was collected after the purpose of the study was explained to the participants and they were informed that their participation was voluntary. The study participants were all practicing doctors who worked in office and a few

attached to a medical college during the period of study. All responses remained anonymous, and no identifier could be used to trace the participants on the survey. A sample was not selected, but there were attempts to contact the whole population. Fifteen of 950 Doctors refused (did not complete) participation (the participation rate was 98.4%). The doctors were surveyed using a self-administered questionnaire. It was comprised primarily of closed ended questions about basic knowledge, attitude and management of fever in children. No exclusion criteria was set.

Statistical methods- The data was analyzed using the SPSS 16.0 program and descriptive statistics were used.

Results

The study included 935 doctors (participation rate 98.4%) with a mean age of 41.5 ± 8.3 and the male–female ratio was 2.3. The socio-demographic characteristics of the participants are presented in Table 1. About 27.5% of the doctors indicated that they had read an article associated with fever in the last 6 months.

Table-1: Demographical characteristic of doctors.

Characteristics	Descriptive statistics
Total participants	935
Male, N (%)	655 (70%)
Female, N (%)	280 (30%)
Age (Mean±SD)	46.5±8.3
Paediatricians	595
Family physicians	340
Marital status	
Married N (%)	905 (95%)
Single N (%)	30 (05%)
Participant with children	
Yes, N (%)	795 (85%)
No, N (%)	140 (15%)
Duration of working per day (Mean ± SD)	10.8±1.8
Number of patients per week (Mean ± SD)	257.4±68.1

Most of the doctors (83.8%) recommended an axillary measurement of fever to the parents of the febrile child and 40% of them indicated that a body temperature of above 37.5°C , according to an axillary measurement, was treated as fever. The body temperature treated as fever by doctors according to an axillary measurement varied between 36.5°C and 39°C . About two third of doctors (73.8%) reported that they recommended an antipyretic agent to every child under the age of 5 with fever. Only 26.2% of doctors took into consideration signs and symptoms other than fever (malaise, irritability, prolonged crying, signs of infection) to prescribe the antipyretic.

Nevertheless only 15% of doctors indicated that they prescribed antipyretics to ensure the child's comfort and remove irritability. The rest of the doctors prescribed antipyretics to control fever and prevent complications of fever, especially febrile seizures.

Some of the statements regarding the management and complications of fever, in agreement with these statements of doctors, are shown in Table 2.

Table-2: Knowledge of doctors regarding fever management and complications in febrile children under the age of 5 years.

Statements	Yes (%)	No (%)	Not sure (%)
Fever is dangerous	33.6	66.4	0
All fevers less than 100°F should be treated even when there are no other signs and symptoms	73.8	26.2	0
All fevers of more than 100°F must definitely be treated whatever is the underlying condition	78.4	21.6	0
A febrile fit can be prevented by antipyretics	88.7	1.8	9.5
Antipyretics should always be used in reducing fever	90	8	2
Other methods like tepid sponging and baths should be recommended to reduce fever	85	10	5
Cold water application can be used to reduce fever	56	29	15
A child who is febrile and sleeping should not be disturbed	35	60	5
When the fever increases the risk of febrile convulsion increases	90	5	5
Febrile convulsion can cause brain damage	30	68	2
Paracetamol or ibuprofen usage can be used to prevent fever and local reactions associated with childhood vaccination	75	20	5
Paracetamol and Ibuprofen can be used alternatively	71.3	23.7	5
Aspirin should not be used in a febrile child	90	8	2
Oral administration of paracetamol is better than rectal administration in children	72.3	24.7	3
Paracetamol and ibuprofen are the only antipyretic drugs which should be used in children.	66.3	33.7	0

A few doctors (30%) indicated that febrile convulsions can cause brain damage. About 35% of the doctors said that fever is harmful for the child and 78.4% of them reported that a body temperature of above 38°C must definitely be treated, whatever the underlying pathology. Many (89%) believed that the main reason for antipyretic usage is to prevent febrile convulsion and 85% indicated that physical methods (warm water bathing) should be recommended to reduce fever. Most of the doctors (90%) believed there is a positive correlation between the height of fever and the incidence of febrile convulsion. Inappropriate beliefs about antipyretics were confirmed by the 78.7% who agreed that paracetamol and ibuprofen can be used alternatively. About (66%) of the doctors agreed that only paracetamol and ibuprofen should be used as antipyretics in children.

Discussion

The study gave us an insight into the various misconceptions that existed among the health care providers. The first major finding of this research is a variation in the definition of fever. Fever is defined as a body temperature greater than 37.5°C according to an axillary measurement by primary care doctors and endorsed by the WHO and IMNCI [11]. In the present study only 40% of doctors knew that a body temperature of above 37.5°C according to an axillary measurement is defined as fever. Body temperature treated by doctors as fever varied between 36.5°C and 39.0°C.

This range was too wide. Definitions of high fever by doctors also varied significantly in other studies [7-10]. In the present study most of the doctors (83.8%)

recommended an axillary measurement of fever to the families. There are conflicting results as regards this subject. Some authors consider tympanic measurement the best method for non-invasive measurement [10], some authors recommend an axillary measurement because it is easy to perform and generally well tolerated. However, it is not very sensitive [11,12].

In the present study about two thirds of doctors recommended an antipyretic agent to every child under the age of 5 with fever, whatever the signs and symptoms. Only 26.2% of doctors took into consideration signs and symptoms other than fever (malaise, irritability, signs of infection) to prescribe an antipyretic. In fact, according to various guidelines, antipyretics should not be used

routinely in management of a febrile child. Use of antipyretics in children is recommended in case of prolonged crying, irritability, reduced activity and sleeplessness [1,2,3,4,5]. Only 15% of doctors indicated that they prescribed antipyretics to ensure a child's comfort and remove irritability, except for reducing fever. The rest of the doctors prescribed antipyretics to control fever and prevent complications of fever especially febrile seizures. International literature confirms that fever phobia is common among parents and health care workers.

Misconceptions about complications of fever especially febrile convulsions often push health care workers to over treat fever and this reinforces the phobia among parents [13,14,15]. The result of the present study confirmed these findings. According to the present study, the fever phobia continues. Almost 34% considered fever to be dangerous for a child. It is known that antipyretic treatment has not been effective in the prevention of simple febrile seizures [12]. In the present study, 88.7% of doctors reported that the main reason for antipyretic usage was to prevent febrile seizure. The Studies conducted in other countries also endorse this ratio of 70%, i.e. similar to that of the present study [1,12].

Although there has been no evidence that fever causes brain damage unless it reaches above 41°C, it is still a common misconception among doctors [15,16]. Fortunately, fever seen in children rarely reaches this high temperature. The most common side effects of fever are benign and include minimal dehydration, increased sleepiness, and discomfort. In the present study, 85% of doctors stated that fever was a risk factor for brain damage if it caused febrile seizure when uncontrolled. There are also other articles that surveyed primary care practitioners' opinions and behaviors with regards to fever, which confirm that fever is seen as a risk factor for brain damage. Unfortunately, health care providers and parents believe that brain damage is a consequence of fever [16,17,18].

Febrile seizure is a rare complication of fever that occurs in 2-4% of febrile children and most are self-limited without any long-term sequelae [16,17,18]. Despite there being no evidence to suggest that brain damage may occur after febrile convulsion, in the present study 30% of the doctors believed that brain damage might occur after febrile convulsion. This misconception is common not only in the present study population but also among other health providers working in primary health care, hospitals and emergency rooms.

In the present study, 85% of doctors agreed that the higher the temperature, the higher the likelihood of a febrile seizure. There are conflicting results about the association between the risk of febrile convulsion and the height of

fever. Many studies have shown that, almost one third of all children who have febrile seizures will have a second episode despite attempts to prevent fever with antipyretics and there was no evidence found that antipyretic treatment reduced the risk of febrile convulsions [6].

Most of the doctors (76.3%) in this study reported that height of fever can be used as an indicator for severe bacterial infection. According to evidence obtained from observational studies height of fever should not be taken as an indicator of the severity of the underlying pathology by itself. In children of less than 3 months of age, height of fever may be an indicator of severe bacterial infection [19].

In the present study, only 10% of participants agreed that a sleeping febrile child should not be disturbed. There are studies which show that parents, doctors and nurses awaken sleeping febrile children who have no other symptoms for antipyretic administration. Accordingly, sleeping febrile child need not be awakened for any reason, including medication [8,17,18].

In various fever management guidelines and studies of the use of these methods to reduce fever, physical methods are not recommended as their usage may be associated with adverse effects and a paradoxical increase in fever and cause more discomfort to the child [19,20,21].

More than half of participating doctors (66.3%) agreed that paracetamol and ibuprofen are the only antipyretic drugs which should be used in children. Studies show that both drugs are more effective than placebo, and can be used confidently in children [22,23]. Evidence obtained from randomized controlled clinical trials show that paracetamol and ibuprofen are the only antipyretic drugs recommended for use in children. In spite of this, in the present study, nearly 35% of doctors were using Mefenemic acid, Nimesulide and other combination drugs for antipyresis.

Most of the doctors who participated in the present study (91.3%) reported that Acetylsalicylic acid should not be used in a febrile child, although this has been known for a long time, nearly 10% of doctors were unsure.

In this study 72.3% of doctors preferred oral administration to rectal administration. Some investigations show that oral acetaminophen is more effective than the rectal form [24].; others found they had similar effects [25] so the comparison of the antipyretic effects of rectal and oral acetaminophen has conflicting results. Use of rectal paracetamol is not recommended by many guidelines because of the risk of overdose. It is difficult to achieve precise dosage in rectal administration.

There are conflicting results about fever management in the literature and this situation could affect the practices of doctors. In many articles alternative treatments of fever with paracetamol and ibuprofen are recommended [26,27,28,29] and alternating acetaminophen and ibuprofen in febrile children appears to be a common practice among doctors. But according to guidelines about management of fever in children; combined or alternating the usage of ibuprofen and paracetamol is not recommended. There is no evidence available that alternating therapy results in improvement in other clinical outcomes and there is also no evidence regarding the safety of this practice. In the present study a great majority of doctors (71.3%) stated that they advised parents to alternate the use of ibuprofen and paracetamol.

Preventive usage of antipyretic before vaccine application is a common implementation in primary health care in India despite the absence of evidence. Most of the doctors (75%) in the present study reported that antipyretic usage should be recommended to prevent fever and local reaction associated with childhood vaccination. According to evidence obtained from well-designed randomized clinical trials, use of paracetamol or ibuprofen is not recommended to reduce fever and local reactions associated with vaccination [30,31].

The present investigation may have potential limitations. Our results may not generalize to all primary health care providers. The present study does not provide information regarding possible differences in responses according to the geographical distribution and age. It is well known that self-reported behaviors can be misleading since some participants might not complete the survey as carefully as they would act in real settings.

Our data suggests that implementation of educational programs and using guidelines regarding the proper management of the febrile child are needed. There were misconceptions about management and complications of fever. Conflicting results about fever in the literature also reinforces these misconceptions.

Although there are guidelines for many diseases in primary care, there is no national guidance on the symptomatic management of fever in India. The management of fever varies across India and also among doctors. As a result, there is a perceived need to improve the recognition, assessment, and management of fever with underlying illnesses in children.

Conclusions

There were significant misconceptions about the management and complications of fever. There is a

perceived need to improve the recognition, assessment, and management of fever with regards to underlying illnesses in children and a national consensus statement on fever and antipyresis in children.

What this study adds to the existing knowledge?

There is a perceived need to improve the recognition, assessment, and management of fever with underlying illnesses in children.

Author's contribution

Dr. Shreeshail V. Benakanal, Dr. Vikram S. Kumar, were primary investigators for the study, collection of proforma, questionnaires, and interpretation of the study. **Dr. R B Patil** was the senior adviser for the study.

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