

Can Mother's Touch Really Assess Fever in Children - A Prospective Cross-Sectional Study Conducted in Paediatric Department, MGM Hospital, Warangal

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ABSTRACT

BACKGROUND

Fever is one of the most common complaints encountered by paediatric practitioners in the clinics and hospitals. Fever as a complaint alone, accounts for 25% of the complaints among others like cold, cough, vomiting etc. Most often it is the first noticed sign by the parents especially, mothers. Very often parents don't consider fever as a sign of illness, but fever itself is considered as an illness. Most of the mothers presume fever by tactile perception and seek medical consultation. Fever is a complex physiologic response to disease mediated pyrogenic cytokines and characterized by a rise in core temperature. In this study, we want to determine if assessment of fever by touch of the mother correlates with measured temperature simultaneously.

METHODS

This study was done in department of Paediatrics, MGM Hospital, Warangal in the age group 6months and 12 years between October 2019 to April 2020. Axillary temperature was measured simultaneously in all those children where mother perceived fever by touch, admitted to the paediatric department MGMH hospital. Temperature more than 99.4 F measured in the axillary area was considered as fever.

RESULTS

Of the 199 mothers 74 i.e., (37.19 %) perceived fever correctly and 125 i.e., (62.81 %) perceived fever which was not recorded on measurement. when educational status of the mother was considered ,graduate mothers could perceive fever better when compared to illiterate mothers.

CONCLUSIONS

In the present study we found that fever perception by tactile sensation is inferior to measured temperature. Parents often wrongly perceive normal temperature as fever and rush to seek professional care. Even educated mothers were unable to assess fever correctly by touch. The results of this study may thus be potentially useful in reassuring parents with fever phobia. All mothers should be motivated and encouraged for use of standardized thermometer to measure fever even at home , thus reducing the burden of false fever in our OPD`S and hospitals.

KEYWORDS

Mothers, Perceived Fever, Measured Temperature

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BACKGROUND

Fever is one of the most common complaints in paediatric patients. It remains one of the most frequently encountered paediatric problems, accounting for 25 % of visits to paediatric emergency rooms.¹ Indeed, it is often the first symptom noted by parents and frequently the initial 'signal' of illness in the child.¹ Most of the mothers presume fever by tactile perception and seek medical consultation.²⁻⁵ Parents frequently perceive fever as a disease rather than as a symptom or sign of illness. Most often we see these parents rushing to a medical facility because they felt that their child was warm or hot to touch. Over anxious and worried parents are likely to overestimate and unnecessarily treat the child's temperature perceived by touch.⁶ Sometimes this anxiety could be a result of exaggerating media these days, peer pressure, events like death of a child in the family we see educated mothers also bringing their children to the clinics with falsely perceived fevers, and not realising the importance of measuring temperature with a standard method, like measuring with thermometer at home itself before presuming fever by touch alone.

Fever in children is one of the most common symptoms for which parents seek medical and nursing advice. Fever is a complex physiologic response to disease mediated by pyrogenic cytokines and characterized by a rise in core temperature.^{7,8} A rectal temperature above 38.0°C (100.4°F) and an axillary temperature above 37.2°C (99.4°F) are generally accepted as fever.⁹

Measurement of rectal temperature is the gold standard method for assessment of fever because this method measures core temperature but this method is not used usually as it is inconvenient for the patient and may sometimes cause anal sphincter injuries. Axillary method of measurement is used more commonly because this method is simple, convenient and children mostly cooperate. Most mothers complain of perceived fever in our wards. Mothers in rural areas, who do not have access to a thermometer perceive fever through tactile sensation. Even educated mothers rely on tactile methods to assess fever, rather than keep a thermometer at home to measure and record temperature. Parents of febrile children often worry about fever and tend to regard it with more concern than physicians. Parental misconceptions often lead to unnecessarily aggressive and inappropriate management of fever in their children.¹⁰ Most mothers presume that their child is running a fever, and is sick, when they feel hot or warm to touch. Children might feel warm to touch after playtime, physical activity, hot climatic conditions especially summer months, that does not mean child has fever. We also see more number of these mothers, coming to our clinics with these falsely perceived fevers during summer months. Parents seldom measure their child's temperature before deciding about the management of fever and whether to seek professional advice. Most parents are worried and anxious that their child might suffer with seizures, loss of consciousness, meningitis, coma and severe life threatening illness, if this falsely perceived fever is not attended to immediately. Only two conditions like heat

stroke associated with delirium and anhidrosis, febrile status lasting more than 1 hour have been described as life threatening fever events and those which require immediate medical attention. The incidence of these two emergent conditions is known to be very rare. Especially during this covid 19 pandemic times, we are seeing more and more parents attending our clinics with fever phobia.¹¹ Touch sensation is very subjective method to assess fever, it varies from individual to individual. It is influenced by many factors like temperature of the assessing person, environmental temperature etc, therefore it cannot be taken as a very good method to assess fever. It is absolutely essential to be accurate in saying that a child is febrile or afebrile as this can solve a lot of medical queries, save precious time and misuse of drugs as well as save lives.⁸ Various studies have been done on this topic in number of countries since two decades, even in 21st century researchers are still interested in understanding the knowledge attitude and practices of mothers in fever assessment and treatment. Studies in the future should concentrate more on the methods to improve fever assessment and management of fever by parents and paramedical workers in remote villages of developing countries. These people must be educated to identify what is a false fever, when a fever can be treated at home, danger signs of illness precipitated as fever and when to seek medical advice or admission to save more lives and also reduce the burden of false fever in busy hospitals.

In this study, we determined if assessment of fever by touch sensation of the mother, co-relates with the measured axillary temperature by a standard digital thermometer, when measured simultaneously in these children. We compared how the educational status of mothers affects assessment of fever by touch

Objectives

1. To determine if mothers can assess fever by touch sensation, correctly as compared to measured temperature by a standard digital thermometer.
2. To determine if educated mothers can perceive fever better as compared to illiterate mothers.

METHODS

Our study is a Cross-sectional observational study. Institutional ethical committee approval taken with IEC No. ECR / 840 / Inst / TG / 2016 / RR - 20. Ethical committee approval certificate has been enclosed along with the submitted article. All the mothers who have participated in the study have consented for the study when we informed them that we are conducting a study on temperature. This study was conducted in children and their mothers admitted to the paediatric department of MGM Hospital, Warangal from October 2019 to April 2020. All children from 6 months to 12 years of age admitted in paediatric department, MGM Hospital were included in the study.

Exclusion Criteria

All children whose mothers perceived no fever.
 All children who received antipyretics 3 to 4 hrs prior to measurement of temperature.

Fever is defined as temperature above 100.4°F when measured orally, as we measured axillary temperature 1°F is deducted and any temperature above 99.4°F is considered as fever. We measured axillary temperature simultaneously in all those children, admitted in department of Paediatrics between age group 6m and 12 years, if the mother perceived fever by touch, in her child. Perception of fever was mentioned as "yes" by the mother and temperature measurement done by trained postgraduates with a standardized digital thermometer until the beep sound, was recorded. The digital thermometer was placed such that it stayed snug between anterior and posterior margins of the child's axilla. It was observed how many children actually had fever on measurement.

Statistical Analysis

Data collected was expressed in numbers, frequency, and percentages. Then the data was analyzed by using Microsoft excel and analyzed on Microsoft SPSS. Qualitative data was expressed in terms of percentages. Chi square test was done and p value derived. A p value of less than 0.05 was considered to be significant.

RESULTS

Of the total 199 mothers, only 74 i.e., 37.19 % of them perceived fever correctly and 125 i.e.; 62.8 % perceived fever, though the temperature when measured was normal, Results are illustrated in Table 1 and Figure 1. When educational status of the mothers was taken into consideration the results were as follows, we categorized these mothers based on their educational status as illiterate, primary school education, secondary school education and graduation and above qualification. Out of 61 illiterate mothers, Only 21 i.e., 34.3 % perceived fever correctly and 40 of them i.e., 65.5 % of the mothers perceived fever when it was not present on measurement. Out of 39 mothers who had primary school education, only 9 mothers could perceive fever correctly, while remaining 30 mothers perceived fever though normal temperature was measured.

Among the 82 mothers, who received secondary school education 35 i.e., 42.6 % of them could perceive fever correctly rest of the 47, perceived fever when it was absent, when measured. Similarly, when we have taken, mothers with graduation and above education who were 17 in total, 9 i.e., 52.9 % of the mothers could assess fever, correctly, and 8 of them i.e., 47 % of them assessed fever when it was not present. The same results are illustrated in Table 2 and Fig.2 below. Table 1 shows results of the number of the mothers who perceived fever when present, represented as correct and of mothers who perceived fever, when it was not present when measured as wrong. The above table shows

that only 37.1 % perceived correctly and 62.9 % perceived wrongly. Table 2 represents the perception of fever and correlation with measured temperature depending on the educational status of the mother. Only 34.4 % of the illiterate mothers perceived fever correctly and this gradually improved to 42.7 % and 52.9 % among educated mothers with secondary school education and graduation. Chi square value was 6.39 and p value was 0.09. The educational status of the mother improved perception of fever correctly from 34.4 % in illiterate mothers to 52.9 % in graduate mothers.

Item	Frequency	Percentage
Perception of mother	correct	74 37.19 %
	wrong	125 62.81 %
Total	199	100.00 %

Table 1. Perceived Fever Vs Measured Temperature

Mother Education Status	Perception of Mother		Total	Chi Square Value is 6.39 Df 3 P Value 0.09
	Correct	Wrong		
Illiterate	21 (34.43 %)	40 (65.57 %)	61	
Primary school education	9 (23.08 %)	30 (76.92 %)	39	
Secondary school education	35 (42.68 %)	47 (57.32 %)	82	
Graduation and above	9 (52.94 %)	8 (47.06 %)	17	

Table 2. Perceived Fever Vs Measured Temperature with Educational Status of the Mother

DISCUSSION

Of the 199 mothers included in this study, only 74 i.e., 37 % of the mothers could perceive fever correctly and 125 mothers i.e., 62.8 % of them could not assess fever correctly. This values clearly show that nearly two thirds of the mothers did not assess fever correctly, by touch method. Therefore, we conclude that touch perception is not as good as measurement with thermometer in assessment of fever correctly. When we compared with the educational status of the mothers from illiterate to graduation the percentage of mothers who perceived fever correctly improved marginally by 18 % from 34.4 % to 52.9 %, with a chi square test value of 6.38 and p value of 0.09. We took a p value of less than 0.05 as significant, but our study has shown the p value as 0.09, which shows that p value is not significant. Thus, this value shows that even the educational status of the mothers did not improve assessment of fever in their children by a remote method like touch perception, thus proving the importance of measurement of temperature by technically sound methods like using a thermometer, also by educated mothers even at home for accurately measuring temperature. Our study clearly documents that tactile perception of fever is not at all a good method to assess fever in children and is always inferior to measurement of temperature by thermometer Most of these mothers did not bother to get the temperature checked before presuming that their children had fever even though they were admitted in the hospital and had access to thermometer.

When we compared our study with similar studies done in different countries all over the world, the percentage of mothers who perceived fever correctly ranged from as low as 12.8% as in a study done by Callanan et al (USA, 2003)⁸ to as high as 81.8 % in a study conducted by Alves et al (Brazil, 2002).¹² Most of the other studies were well within

the range of 25 % to 40 % correct values .Our study was also within this range with the percentage of mothers, who perceived correctly being 37 %. The study done by Banco et al USA in 1984 has shown that 17.6 % of the mothers were able to perceive fever correctly, in a similar study done by Callanan et al in 2003 in the same country has shown similar results. This shows that, even in an advanced country like USA there was not much improvement in the methods of assessment of fever and most of the mothers even after 20 years, still relied on tactile methods to perceive fever rather than assess fever by methods of measurement. In an Indian study conducted by Chaturvedi et al in 2003, they observed that only 34 % of the mothers perceived fever correctly. Our study showed that only 38 % of the mothers perceived fever correctly. This comparison proved that even after 2 decades there is negligible difference in the perception of fever and practices of fever assessment and measurement.

None of the studies have co-related educational status of the mothers with the assessment of fever so far. We can say ours was the first to have co-related educational status of the mothers with fever assessment by perception. The results were getting better, as the educational status of the mothers improved, perception of fever by touch was also getting better, but the results were not as good as measured methods. Even in the educated mothers, with educational status being graduation and above 47 % of them felt fever was present in their children when it was actually absent. When we observed the variation between illiterate and well-educated mothers the difference was not much ranging from 34.3 % to 52.9 % with a difference of 18.6 % which is not much, and p value is not significant. The Table 4 gives a comparative data of different studies done in various countries.

Studies	Percentage of Mothers who Perceived Fever Correctly
Alves et al (Brazil, 2002) ¹²	81.1
Nwanyanwu et al (Malawi, 1997) ¹³	36.7
Banco et al (USA, 1984) ¹⁴	17.6
Callanan et al (USA, 2003) ⁸	12.8
Chaturvedi et al (India, 2003) ¹⁵	34.0
Whybrew et al (Zambia, 1998) ¹⁶	24.5
Graneto et al (USA, 1996) ⁵	38.5
Hooker et al (USA, 1996) ¹⁷	83.2
Singhi et al (India, 1990) ¹⁸	38.9

Table 4. Comparative Data of Different Studies Done in Various Countries

Strengths of Our Study

This study was done in children of different age groups of children admitted in the paediatric ward of our MGM hospital. Mothers with different educational status were involved in the study. This comparative assessment of fever with co-relation to mother's educational status was never done before in any of the studies. This study has brought out the importance of education in the mother in improving the health status of the family.

Limitations of this Study

Rectal temperature was not measured which was gold standard method keeping in view the practical difficulties. The study population, was limited to only a small subset of

population, admitted in the paediatric wards of only one teaching hospital. The results cannot be generalized to all the centres. For this to happen, a larger study group from various hospitals have to be studied.

CONCLUSIONS

Irrespective of their educational status all mothers should be encouraged and motivated to use a thermometer to measure and record fever accurately instead of assessing wrongly by an age-old crude method like touch. From this study we observed that it is not only the educational status of the mother that has to change, but the attitude and practices in health care aspects also need to be changed. The responsibility to bring about this change in knowledge , attitude and practices lies on the policy makers, health care facilities and fraternity right from grass root level, like a subcentre in a village to a tertiary care centre like a teaching hospital. During our study when we have shown these mothers that their children do not have fever by measurement =, although she felt her child has fever by touch, the mothers were so relieved and getting convinced to use thermometers and record temperature.

Even at home, parents must be encouraged to maintain a thermometer for measurement of accurate temperature instead of rushing to the busy OPDs with falsely perceived fevers by crude methods like touch. This simple intervention reassures the parents of false fever fears, relieves them of unnecessary anxiety and helps us paediatricians off the burden of false fever cases in the busy clinics and hospitals.

We recommend that considerable effort should be made by Paediatricians to appropriately educate mothers regarding correct methods of assessment fever and its management irrespective of their educational status. Mothers should be taught how to use and read thermometers correctly. Use of digital thermometers should be encouraged as they are easier to read. These days, lot of thermometers are available in the market like digital ones which can be handled with little knowledge and training, infrared red thermometers, though a little costly which are pretty much useful during these covid-19 times for their non-touch techniques, and ease to handle even by a less educated person. Health education to dispel wrong fears about fever should be a part of routine paediatric care and interventions based on behavioral change are advocated so that fever can be perceived as a symptom caused by a disease process which should be diagnosed and treated.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

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