The reliability of mothers to assess the presence of fever in their children

Sameeh M. Al-Almaie, MBBS, FFCM (KFU).

ABSTRACT

Objective: To assess the reliability of mothers to subjectively detect the absence or presence of fever in their children.

Methods: A prospective study was carried out on 1907 children (age 12 years and below) attending the emergency room pediatric triage clinic, King Fahd Hospital of the University in Al-Khobar, Eastern Province of Saudi Arabia. Their mothers were asked if they have fever or not, before the children's temperature was recorded.

Results: The sensitivity and specificity of detecting fever in the children by their mothers through subjective means were 83% with an accuracy rate of 83.4%. Mothers who stated that their children were febrile were correct 56% of the time, while those who said their children were afebrile were correct 95% of the time. The false positive rate was 17% and false negative rate was 5%.

Conclusion: The ability of mothers to assess the presence or absence of fever through subjective means was fairly reliable. It could be used as a reasonable screening tool to rule out presence of fever in children in the absence of objective assessment.

Keywords: Fever, children, subjective fever, mothers, emergency department.

Saudi Medical Journal 1999; Vol. 20 (9): 696-698

Fever, occurs as a result of an upward shifting of the thermostatic mechanism of the anterior hypothalamus in response to exogenous pyrogens. It is a common symptom in pediatric practice. It is reported to account for as many as 20% of pediatric emergency department (ED) visits. Fever is defined as a rectal temperature of 38°C or greater. Diurnal fluctuations, the effects of anatomic site, oral stimulation and body position are factors, which should be taken into consideration when establishing criteria for the febrile state. The rectal temperature, however, remains the most accurate method in recording body temperature, especially in patients less than 3 years of age.

In clinical practice, fever is considered to be potentially serious, although an extremely non-specific, manifestation of a spectrum of infections and other illnesses, ranging from a self-limiting viral syndrome to life-threatening bacterial disease. Although most febrile children, aged 3 to 24 months will be well without treatment within one to 4 days, still around 6% of them are at risk of serious bacterial infections indicating the need for aggressive evaluation. The incidence of such infections tends to increase with decreasing age and increasing degree of fever, in the immuno-compromised (including asplenia), in cancer and HIV infection. Children with sickle cell disease are at an increased risk of developing rapid, at times even fatal sepsis from streptococcal pneumonia. Thus hospitalization and parental antibiotic treatment of these children, when febrile, is the standard of care in most
Mothers subjective assessment of fever ... Al-Almaie

There are usually exaggerated concerns, anxiety and over-reaction to fever in children, in both parents as well as practitioners, resulting in extensive work-up and unnecessary treatment. This was demonstrated in a survey in 1993, where one-fifth of the pediatricians and family physicians would start antipyretic therapy for a temperature of 38°C or less, and one-third cited brain damage as a possible consequence of a febrile seizure. Mothers usually depend on their own ability of detecting subjectively the presence or absence of fever in their children without using a thermometer. This ability became an important tool in making decisions to present children for medical consultation or not. In different studies in USA and India it was found that mothers can identify fever in most young children without the use of a thermometer. However, this ability of detecting fever subjectively in children by their mothers was not tested before in the Saudi community. The aim of this study was to know the reliability of mothers in our community to subjectively detect the presence or absence of fever in their children.

Methods. A prospective study was carried out over a 4 week period in the year 1998. The total number of subjects involved was 1907 children (aged 12 years and below) who presented to the Pediatric section in the ED, at King Fahd University Hospital in Al-Khobar town, Eastern Province, Saudi Arabia. This is a 440 bed hospital with an average of 130,000 patient visits to the ED each year. Children who arrived at the ED by ambulance, injured children, those judged to be critically ill, and those who were not accompanied by their mothers were excluded from the study. The child’s age and gender were recorded. The child’s mother was asked whether the child had a fever or not at the time of presentation to the ED. The child’s temperature was then taken by an IVAC digital machine either orally (children above 3 years of age) or rectally (children 3 years or less). For the purpose of this study, fever was defined as temperature of 37.8°C or higher orally or 38.3°C or higher rectally. A standard 2 x 2 table was constructed according to the mother’s subjective assessment of fever and the objectively measured adjusted temperature. Sensitivity, specificity and positive and negative predictive values (PPV, NPV) with 95% confidence intervals were calculated. Chi-square and Phi tests were applied to calculate the level of significance of the results.

Results. The total number of children included in this study was 1907 patients, 1095 (57%) were boys and 812 (43%) were girls. The mean age was 44.99 months (standard error = 0.925). The median was 36.0 months and the mode was 24 months. The methods of palpation used by the mothers for the subjective assessment of fever were palpation of either the forehead, face or other parts of the body using either finger tips, back of hand or dorsal aspect of middle phallanges. The number of children whose mothers stated that they had fever was 573 (20%) patients. (Table 1) The prevalence of objective fever (37.8°C or higher orally or 38.3°C or higher rectally) was 20% yielding NPV of 95% and PPV of 56%, with an accuracy rate of 83%. The sensitivity of detecting fever in children by their mothers through subjective means was 83.4%, while the specificity was 83.3%. The false positive rate in detecting fever in children subjectively by their mothers was 17% and the negative rate was 5%.

Discussion. Mothers usually depend on their subjective assessment to determine the presence or absence of fever in their children when they are ill. They used direct palpation, by hand, of selected anatomic sites to determine presence of fever. Only around 9% of parents were found to use thermometers before bringing their children for medical care. The question, which is always put forth especially in ED, is: can parents accurately judge whether their child has fever without using a thermometer? It was thought that this is only correct 50% of the time, so they might as well flip a coin! Several studies were carried out to investigate the subjective assessment of fever by parents. Bannco reported the sensitivity of mother detection of fever by subjective means to be 74% and the specificity to be 86%, with 95% NPV and 53% PPV. Hooker reported similar results with a sensitivity of 82% and a specificity of 76.5%. Singh found that mothers were able to detect subjectively 89% of febrile children. In this study almost similar results were obtained. The methods of palpation used by the mothers for the subjective assessment of fever were palpation of selected anatomic sites using the hand, which was similar to other studies. Both sensitivity and specificity were 83%. The mothers denial of
subjective fever in their children was highly predictive (NPV, 95%) of not having objective temperature increases. On the other hand the probability of the child having objective fever when the mother stated that he is febrile was not high (PPV, 56%). The mother was not able to identify presence of fever through subjective means in 64 (5%) of the febrile children, while 253 (17%) of the afebrile children were identified by the mother as having fever. This could be attributed to the possibility of having fever at home but not when exposed to the cold environment where their temperature is expected to drop.

All this indicates that the ability of mothers to detect presence or absence of objective temperature of 37.8°C or greater orally (38.3°C or greater rectally) in their children by subjective means is fairly reliable. These findings also showed that the assessment of presence of fever by the mother through subjective means is a reliable screening tool to rule out presence of fever more than detecting its presence. One implication of this study is that physicians should consider the mother's word when they report fever in their children. The other implication is that mothers in this community could be educated to rely on their subjective assessment of fever in their children to start first aid measures to lower it. Considering the variations in thresholds for febrile convulsions in children, mothers could, in view of the results of this study, play an important role in lowering the incidence of these convulsions.

References