

Perceptions of Fever Among Adults in a Family Practice Setting

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Febrile illnesses are common clinical problems for the family physician. A questionnaire study was conducted of 100 adult patients in a family practice clinic to gain understanding of their knowledge about fever and its management. Many misconceptions were documented among adult patients about their own fevers and those of children for whom they cared. Misconceptions included the conviction that fever is more dangerous in children than in adults and a distorted concern about bodily damage from fever. Patients demonstrated a poor understanding of normal body temperature, minimum and maximum febrile temperatures, and minimum temperatures warranting antipyresis. Though many owned thermometers, they indicated improper usage and demonstrated inaccurate temperature-reading technique. Questionnaire responses indicated that health care providers had done poorly in educating patients about fever, its consequences, and its proper treatment.

Assessing and managing febrile patients is a common clinical task for the family physician.¹ It is also not uncommon for the physician to find himself at odds with an adult patient or a child's parent regarding the significance and proper treatment of fever.

In recent years an abundance of research on fever has been reported,^{2,3} and the age-old debate as to whether fever is more advantageous or disadvantageous to its host has reappeared in the medical literature.^{4,5} Pediatricians have been responsible for much of the recent clinical literature on fever and on patient education about this problem.⁶ In 1980 Schmitt⁷ documented the fear and misinformation borne by many parents when their children become febrile, labeling overconcern about low-grade fevers and their consequent "fever phobia." He demonstrated that parental misconceptions led to inappropriate home management of children's fevers and proposed health educational guidelines to counteract fever phobia.

Casey and colleagues⁸ underscored and extended Schmitt's findings by demonstrating many misconceptions about fever even among better educated parents of pediatric patients in a private group practice. In addition, these investigators administered a standardized educational intervention designed to enable par-

ents to understand, measure, and both treat their children's fevers and make decisions regarding the appropriate setting in which to seek a physician's evaluation. They then reinforced this educational effort with follow-up information mailed two months after the initial interview. Later, the experimental group demonstrated a reduction in the number of inappropriate physician contacts and fewer medication errors.

Although family medicine as a discipline emphasizes the usefulness of patient education,⁹ and although there are multiple references in the family medicine literature on the topic of fever,^{1,3,10} there have been no studies of what adult family medicine patients know about fever. A computer search of the literature failed to reveal a single article pertaining to adult patients' understanding about their own fevers in contrast to the pediatric literature cited above. Therefore a study was undertaken in the Family Practice Clinic at the Medical College of Georgia. The objectives of this study were to determine the status of knowledge of adult patients about (1) fever in general, (2) pediatric fevers, and (3) adult fevers.

METHODS

The Family Practice Center (FPC) provides health care services to the general public. The current active patient population is estimated at about 18,000.

A questionnaire on the subject of fever was adminis-

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TABLE 1. SOCIODEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION

Characteristics	Number
General population	
Number of subjects	100
Male	13
Female	87
Mean age (range 17-82 yr)	44
Mean number of children in family (range 1-9)	2
Mean number of years of formal education (range 0-20)	12
Subpopulation caring for children	
Number of subjects caring for children < 12 years of age	47
Mean age (range 20-57 yr)	31
Mean number of children cared for	2
Mean number of years of formal education (range 5-20)	12

TABLE 2. INAPPROPRIATE RESPONSES TO SELECTED QUESTIONS REGARDING FEVER AND ITS MANAGEMENT IN CHILDREN

Response Item	Percentage Responding Inappropriately (n = 47)
Fever is more dangerous in a child than in an adult (correct answer: no)	81
Youngest age at which oral temperature is accurate (correct answer: 5 yr)	57
Length of time thermometer should be left in rectum for accuracy (correct answer: 2 min; range of actual answers, 1-8 min)	50
Fever medication can be safely given to a child without calling physician (correct answer: yes)	30
One should warmly bundle up child with fever (correct answer: no)	23

tered to 100 adult patients selected at random and interviewed in the FPC waiting room as they awaited appointments with their physician. All questionnaires were administered by one of the authors (D.C.) or an assistant over a six-month period in 1985.

Demographic data obtained with all questionnaires included age of the interviewee, sex, attained level of education, number of children in the family, and number of children aged 12 years or younger cared for by the interviewee. Questionnaire items were designed to obtain information about both factual knowledge of and attitudes about fever and its treatment. Ten questions were designed to ascertain perceptions about fever in children and were asked only of patients who cared for children aged 12 years or younger. The remaining 26 items were designed to determine perceptions about fever in general and in adults and were asked of all interviewees.

In an attempt to obtain unbiased data that truly reflected patients' perceptions about fever, the questionnaire relied principally upon open-ended questions (ie, no suggestion of the "right" answer); yes or no questions and three-item choice questions were also employed. Wording of questions was left general so that the average lay person might understand and respond, yet an attempt was also made to obtain specific definitional data. For example, subjects were asked questions about fever and high fever without defining the terms. Other questions, in an open-ended fashion, asked them to tell what they thought was the lowest temperature that was a fever and what they would

consider a high fever. Patients were also asked to read a standard mercury bulb thermometer preset at 100.8° F. Appropriateness (correctness) of responses to questions was determined by the physician investigator based on the medical literature.

RESULTS

Table 1 summarizes the sociodemographic characteristics of the study population. A wide range of age and educational level is noted. Roughly one half of respondents cared for children aged less than 12 years.

Table 2 reveals a significant number of inappropriate responses to selected questions asked regarding children's fevers. These adult study subjects considered fever to be more dangerous in children than in adults, a finding not reported by Schmitt⁷ or Casey et al.⁸ The majority of caretakers felt they could safely give antipyretic medication when necessary without calling the physician first. Fifty-seven percent of caretakers apparently would have attempted an oral temperature determination at age 4 years or less. Fifty percent would insert a thermometer rectally for periods that were either too brief or too long relative to the recommended two-minute time period. The majority of caretakers (77 percent) would apparently appropriately avoid excessive bundling of children with fevers.

In the broader area of general adult perceptions regarding fever, only 34 percent of respondents felt that fever was nearly always a sign of serious illness; 64 percent felt it was not necessarily so, and 2 percent did not know. Yet, when asked how worried they were about the damage high fever could do, 48 percent said they worried very much, while 31 percent said they worried somewhat, and 21 percent said not much.

When asked to define normal body temperature, 51 percent of the study population gave the familiar 98.6°F as the standard; other answers ranged from 80 to 99°F. When asked what was the lowest temperature that constituted a fever, the most popular answer was 100°F (37 percent), but 40 percent answered 99.6°F or less, and the range of answers was from 80 to 104°F. A high fever was said to be 103°F or less by 57 percent and 102°F or less by 41 percent of the respondents.

Asked what minimum temperature would call for initiation of antipyretic medication, 64 percent indicated readiness to treat fevers less than 102°F, and 40 percent felt therapy was indicated for temperatures of 100°F or less. Eighty-one percent responded there would be no case in which there would be no need to treat a fever. Only 26 percent could identify the active ingredient in Tylenol as acetaminophen. When asked how high an untreated fever could climb, 19 percent of the patients indicated 107°F or greater, and four patients responded that the body temperature could soar to 200°F or more (modal response: 105°F; no answer: 15). There was concern about the harm high fever could cause. Specific types of damage feared included brain damage (49 percent), death (17 percent), convulsions (17 percent), delirium, infections, dehydration, Reye's syndrome, unconsciousness, coma, and blindness.

Patients were well equipped to measure body temperature; 80 percent said they owned a working thermometer and could use it to report results by telephone to a physician, yet 43 percent incorrectly stated that fever could be accurately determined by palpation of the forehead. When asked to identify correctly the preset temperature (100.8°F), 37 percent of subjects were within one scalar marking on the thermometer ($\pm 0.2^\circ\text{F}$), 38 percent said they could not read it, and 25 percent gave an answer that was incorrect by more than 0.2°F (range: 81 to 102°F).

Finally, inquiry was made as to the source of patients' information about fever. Their answers included experience in raising children (29 percent), medical personnel (23 percent), experience not specified (23 percent), mother (17 percent), school (14 percent), reading (9 percent), and a medical guide (2 percent). In another question, when specifically asked whether their physician had ever talked with them about fever and its treatment, only 28 percent replied in the affirmative.

DISCUSSION

The results of this study are generally consistent with those of Schmitt⁷ and Casey et al⁸ and suggest that adult patients not only worry about their children's fevers but also about their own. They have significant misconceptions about fever, such as the majority belief that fever as such is more dangerous to children. In fact, fever apparently is not more dangerous to chil-

dren apart from very specific situations (eg, possible harm to the fetus^{11,12} or the febrile infant's being more susceptible to secondary dehydration from increased insensible losses). Such misconceptions about fever can lead to its inappropriate treatment. Health care providers have not done well in educating patients in this area.

Obvious concern exists about the consequences of fever, as roughly one half of respondents said they worried very much about the damage that high fever could produce. They then proceeded to show little understanding of the human range of normal temperature and individual variation, and concomitantly demonstrated a very poor understanding of what actually constitutes a fever or a significant fever.

The issue of normal human temperature is complex, but there is general professional agreement upon what constitutes fever. Schmitt⁶ defines oral and rectal temperatures of 100°F and 100.4°F, respectively, as a fever, yet about one third of the study population said fever was present with a temperature of 99°F or less. And while clinical definition of high fever is arbitrary (many would define it in the range of 104 to 105°F), 41 percent of subjects defined high fever as 102°F or less. With these perceptions of elevated body temperature, it is little wonder that the patients indicated they treat fever overly aggressively. Most would initiate therapy at 102°F or less, and many at 100°F or less. Also of concern, with the wide choice of brand names of antipyretics available today, is that only about one quarter of subjects knew that acetaminophen is a very common active ingredient.

Temperature in excess of 106°F (hyperpyrexia) is a medical emergency and requires prompt therapy.¹³ Below this level, however, there is considerable professional controversy as to what is a treatable fever (ie, in the symptomatic sense, not disease-specific) and whether indeed fever should even be treated at all.^{4,5} Schmitt⁶ offers 102°F as a temperature level in children at which one may begin treatment with an antipyretic agent if the child is uncomfortable. He recommends withholding of water sponging until the fever climbs to 104°F or greater. Simon¹³ suggests treating individuals symptomatic from fever or when body temperature exceeds a range of 102 to 104°F. This lack of clear-cut treatment guidelines among professionals may contribute to patient misconceptions.

The patients' perceptions of how high an untreated fever can rise are again in conflict with the literature, and several responses (namely, 200, 300, 500°F) are amusing. As first documented by DuBois,¹⁴ clinical experience shows that febrile temperatures rarely rise as high as 106°F, and almost never to 108°F or greater. The hypothalamic thermoregulatory center, if uninfluenced by complicating circumstances (eg, heat stroke or drugs), seems to exert a shutoff valve phenomenon so that febrile temperatures are generally kept below a level that would seriously damage body tissues.¹³

Patients, however, are overly concerned about

bodily damage from high fever. In his review of the literature, Schmitt⁷ found only two rarely occurring and scantily documented complications of high fevers: Heat stroke (typically the consequence of excessively clothing a febrile child) and febrile status epilepticus. Apart from febrile convulsions (which do not recur in a majority of patients¹⁵ and which are not typically associated with lasting neurologic sequelae¹⁶), most usually healthy patients, if kept well hydrated, appear to be in no serious risk of morbidity from common fevers.

The patients in this study own thermometers, but many could not use them properly. Fewer than 40 percent of the subjects for whom a specific reading was recorded came within two tenths of a degree of the correct temperature. Even considering those who came reasonably close to the correct reading ($\pm 0.5^\circ\text{F}$), the correct responses just barely totaled 50 percent. This inability has been recognized by others.¹⁷ Also, belief in the age-old hand upon the forehead method for detecting fever dies hard. Bergeson and Steinfeld¹⁸ have demonstrated the inaccuracy of such palpation and the high number of false-negative fever determinations it produces.

The body site for temperature determination is also important. Over one half of the caretaking respondents would attempt oral temperature determination in children aged 4 years or less. Yet the youngest age at which an oral reading is generally accurate is 5 years.⁶ Two minutes is an appropriate period for rectal thermometer insertion and temperature determination,⁶ although one half the caretakers did not know this.

Health professionals have apparently done little to educate their patients about fever. Only a minority of the patients indicated a significant educational imprint by health care personnel. It may be that patients simply do not recall a physician's or nurse's teaching effort about febrile illness, but these data are still bothersome, especially in light of the study by Casey et al,⁸ which showed that proper educational intervention may have an impact upon patient perceptions and the subsequent use of the health care system and of medications. Fever is common and therefore is an important clinical topic about which to properly educate pa-

tients. Unfortunately, there is some indication "fever phobia" may have been unwittingly created among patients by the messages physicians themselves have conveyed about fever.^{7,19} Historically, successful antipyresis of low-grade fevers has perhaps allayed not only patient anxiety, but also that of health care workers as well.

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