Background: Fever is the most common sign of childhood illnesses and febrile children constitute a substantial proportion of the practice of pediatrics and family medicine.

Objectives: To highlight the pattern of febrile illnesses in children attending pediatric ambulatory health-care settings.

Methods: A one-year prospective study was conducted on febrile children who were consecutively seen and managed at two walk-in primary-care clinics in Sulaimania Children’s Hospital, Riyadh. Data collection and analysis were structured around the principal study objectives.

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Pattern of Febrile Illnesses in Children  61
**Results:** Among the 16,173 children seen, 4086 (25.3%) were identified as having a fever and evaluated to determine the aetiology of their febrile illness. Boys outnumbered girls and a significant increase in the frequency of febrile illnesses was noted in children 4 to 24 months of age. Upper respiratory tract infections were the commonest cause of fever (75%) and most of these infections were viral rhinopharyngitis. Viral gastroenteritis and pneumonia were prominent diagnoses, each accounting for 5% of febrile illnesses. Notably of low frequency were serious bacterial infections, such as meningitis (0.5%), cellulitis and bone or joint infection (1.8%) and urinary tract infection (0.7%). Only 9% of the febrile children required hospitalization. The ambulatory management of the other febrile children included the prescription of oral antibiotics to 64% of them.

**Conclusion:** The proper clinical assessment of these febrile children and the prudent use of laboratory tests and antimicrobials remain the most important management strategies in primary health-care practice.

**Key Words:** Bacteremia, Fever, Gastroenteritis, Meningitis, Otitis Media, Pneumonia, Upper respiratory tract infection, Urinary tract infection.

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**INTRODUCTION**

Fever is the most frequent presenting symptom in many ambulatory health care settings. The evaluation of a child with a fever is one of the primary-care physician’s most perplexing clinical situations. Fever may herald the onset of a serious and life-threatening disease such as meningitis, or it may be the sole manifestation of a mild self-limited viral infection. Several studies confirm the observation that most acute febrile illnesses in children are of presumed viral aetiology and require little more than supportive therapy. Hence, the most important issue for primary-care physicians is to focus on the fever’s aetiology and to rule out serious diseases.

Although distinguishing a child with a viral illness from one with bacterial meningitis is usually not difficult, there may be considerable overlap in the clinical appearance of children with fever without source due to viral aetiology with those with occult bacterial infection. Thus the clinical evaluation of these febrile children is a complex series of steps based on history and physical examination as well as an appreciation of important variables such as age, severity of fever and observation of the child. This series of steps represents a rich database that allows the health-care provider to separate those children requiring laboratory evaluation from those who have minor illnesses. The ability to distinguish the truly sick child from the majority with trivial illnesses is a skill obtained through training and experience. Assessment must be done in a relaxed and comfortable setting. The child should be given antipyretics and approached in a gentle non-threatening manner.

This study was conducted in the pediatric walk-in clinics of Sulaimania Children’s Hospital (SCH), Riyadh, with the aim of highlighting the pattern of febrile illnesses in children attending these pediatric ambulatory health care settings.

**SUBJECTS AND METHODS**

Sulaimania Children’s Hospital (SCH) is located in a heavily populated area of Riyadh City and serves different socioeconomic strata of the Saudi community, mostly of middle and lower socio-economic status. The hospital
ambulatory care services are very busy and only two walk-in clinics were assigned for this study. Febrile children aged 14 years and younger who consecutively presented to these two walk-in primary-care clinics between March 1997 and February 1998 made up the study cohort. Fever was defined as a documented temperature of 38.0°C or higher per rectum (or “rectal equivalent”). A rectal equivalent temperature was calculated by adding 0.5°C to the oral temperature and 0.8°C to the axillary temperature.

The data collection and analysis were structured around the principal study objectives, namely, the pattern of febrile illnesses in children seen in the clinics. Patient evaluation and management were completed by the attending pediatricians. Demographical information, pertinent historical and physical findings, laboratory data, diagnosis and treatment were recorded. Laboratory or radiographical investigations, including complete blood cell count, urinalysis, cultures of throat, blood, cerebrospinal fluid, urine and other body fluids, and chest or bone x-rays were performed at the discretion of the attending pediatricians.

A serious bacterial illness was defined as bacterial growth of a known pathogen in cultures of blood (bacteraemia), spinal fluid (meningitis), joint fluid (septic arthritis) or urine (urinary tract infection) with the relevant clinical signs and symptoms. Pneumonia was confirmed by finding a new discrete infiltrate on the chest film that was read by a radiologist. Viral illness was either a diagnosis of exclusion when cultures were sterile (e.g., throat or stool cultures) and no source on the physical examination could explain the fever, or a diagnosis of a specific viral entity, such as chickenpox. Viral studies were not done because of limited laboratory resources.

Patients’ charts were subsequently reviewed by one of the research co-investigators and relevant information was extracted. The study protocol was approved by the Hospital Research Committee.

RESULTS

Among the 16,173 consecutive children seen in the two walk-in clinics, 4086 (25.3%) children within the specified age range, 0 to 14 years, were febrile. The age distribution is presented in Table 1. Boys outnumbered girls (1.2:1). The age distribution of febrile patients showed a significantly sharp increase in the frequency of febrile illnesses among children 4-24 months of age, with an approximate rate of 49% of total study patients. The number of children with various febrile illnesses did not vary significantly by sex distribution.

Table 1: Age distribution of 4086 febrile children seen in the pediatric walk-in clinics of Sulaimania Children’s Hospital (SCH)

| Age in months | No. of patients (%) |
|---------------|---------------------|
| 0-1           | 90 (2.2)            |
| 1-3           | 74 (1.8)            |
| 4-12          | 1066 (26.1)         |
| 13-24         | 918 (22.5)          |
| 25-36         | 552 (13.5)          |
| 37-60         | 556 (13.6)          |
| 61-168        | 830 (20.3)          |

The different febrile illnesses assigned to the study participants were grouped into 10 clinical diagnostic categories and are depicted in Table 2 to provide an interesting single overview of the pattern of febrile illnesses. Upper respiratory tract infection (URTI) was the commonest cause of fever among children attending the hospital pediatric ambulatory care areas, accounting for 75% of study febrile children; the majority of the URTI were presumably of viral aetiology, because bacterial pathogens were rarely isolated from our tested patients. Notably of low frequency
**Table 2: Pattern of febrile illnesses among 4086 children seen in pediatric walk-in clinics of SCH**

| Clinical diagnosis               | No. (%) |
|----------------------------------|---------|
| Upper respiratory tract infection| 3070 (75.1) |
| Rhinopharygitis (coryza)         | 1736 (42.5) |
| Pharyngitonsillitis              | 798 (19.5) |
| Otitis media                     | 536 (13.1) |
| Lower respiratory tract infection| 242 (5.9) |
| Croup/Bronchiolitis              | 66 (1.6) |
| Pneumonia                        | 176 (4.3) |
| Gastroenteritis                  | 212 (5.2) |
| Bacteraemia                      | 16 (0.4) |
| Meningitis                       | 20 (0.5) |
| Cellitis/Osteomyelitis/           | 72 (1.8) |
| Septic arthritis                 |         |
| Urinary tract infection          | 28 (0.7) |
| Chickenpox                       | 48 (1.2) |
| Measles                          | 18 (0.4) |
| Miscellaneous                    | 360 (8.8) |

**Table 3: Management of 4086 febrile children seen in the pediatric walk-in clinics of SCH**

| Management                          | No. (%) |
|-------------------------------------|---------|
| Hospitalization                     | 380 (9.3) |
| Outpatient antibiotic therapy       | 2620 (64.1) |

were meningitis, invasive infections other than pneumonia, and classical viral exanthems. The miscellaneous group included healthy well looking febrile children without localizing signs, children with fever associated with non-specific rash, and children with fever developing within 24 hours of DPT vaccination.

In Table 3, it is of interest to note that the rate of admission was low. It is clear that the majority of pediatric infections were managed on an ambulatory basis; two-thirds of the patients were given oral antibiotics. Hospitalization occurred in patients who required further diagnostic studies or inpatient treatment of the underlying disease of the fever.

**DISCUSSION**

Fever is the most common sign of illness in children and is of concern to both parent and physician. Febrile children comprise a substantial proportion of the practice of pediatrics and family medicine. Approximately, 25-35% of all encounters in such ambulatory care settings for children were prompted by fever alone. Furthermore, fever in children leads to a high number of telephone calls to health care facilities. In our study, 25% of children presenting to the pediatric ambulatory settings had fever. Hence, the evaluation of the febrile child is a constant and demanding feature of any pediatric or family and community medicine practice.

The majority of children who present with fever are less than 3 years of age. This was confirmed in this study where two-thirds of our febrile patients were less than 36 months of age and the highest frequency of fever was found in children 4-12 months of age. The most common diagnoses documented in our pediatric patients with acute febrile illness were URTIs which were responsible for 75% of the cases; the majority of the URTIs were presumably of viral aetiology, and about one-third of these cases had pharyngitonsillitis or otitis media. Similar findings were previously reported. Lower respiratory tract infection, particularly pneumonia, and viral gastroenteritis was also prominent diagnoses, each accounting for approximately 5% of our patients with acute febrile illnesses. Our data are in agreement with the previous reports. Low socio-economic status and overcrowding in houses have been well documented as risk factors for respiratory infections in developing countries. Our data have demonstrated an increased incidence of these infections among children. Thus, apart from any medical consequences, respiratory tract infections impose a heavy economic burden on the community. These infections cause more than one-third of all deaths among children under 5 years of age in the developing world, frequently surpassing gastroenteritis as the leading cause of death. In our study, accurate data regarding bacterial and viral aetiologies for acute respir-
atory infections in children were lacking because of the difficulty in making microbiological diagnosis in ambulatory care settings. Most fevers in our pediatric patients were most likely of viral origin, self-limited and unlikely to be associated with any serious consequences.

Our study shows that approximately 9% of the febrile children seen in the ambulatory settings required hospitalization. Therapeutic considerations in primary health care practice may be guided by the knowledge of the major contribution of viral diseases to febrile illnesses in children. The use of antibiotics can be confined to those with clearly defined indications for treatment (e.g., tonsillitis, otitis media and pneumonia) and those whose clinical presentation and systemic bacterial cultures warrant parenteral antibiotic therapy. The appropriateness of prescribing antibiotics is the major decision in the management of infections, particularly respiratory ones. That decision is important since the likelihood of the effectiveness of the antibiotic therapy must be balanced against cost, the inconvenience of administering medication to young children, side-effects and reactions, and possibly a harmful effect in a community resulting from changes in the bacterial flora and antibiotic sensitivity. In the USA, 53-71% of the patients seen for the common cold were given antimicrobials. In our data showed similar practice among physicians working in ambulatory care settings.

In conclusion, this study represents a local experience with a convenient sample population presenting to a pediatric ambulatory care setting. The vast majority of febrile pediatric patients were children 3 years of age and younger suffering from a viral illness. The proper clinical assessment, accompanied by the prudent use of laboratory tests and appropriate medications, remains the best guide to the management of febrile children.

REFERENCES
1. O’Neill MB. Fever in Children. Can J Paediatr 1994; 2:48-9.
2. Wright PF, McKee KT, Sell SH. Patterns of illness in the highly febrile young child: epidemiologic, clinical, and laboratory correlates. Pediatrics 1981; 67:694-700.
3. Baraff LJ, Lee SI. Fever without source: management of children 3 to 36 months of age. Pediatr Infect Dis J 1992; 11:146-51.
4. Radetsky M. The clinical evaluation of the febrile infant. Primary Care 1984; 11:395-405.
5. McGowan JE, Bratton L, Klein JO, Finland M. Bacteremia in febrile children seen in a “walk-in” pediatric clinic. N Engl J Med 1973; 288: 1309-12.
6. Soman M. Characteristics and management of febrile young children seen in a university family practice. J Fam Pract 1985; 21:117-22.
7. Al-Eissa YA, Familusi JB, Al-Zamil FA, et al. Profile of children hospitalized for their first febrile convulsion in Riyadh, Saudi Arabia. J Trop Geogr Neurol 1992; 2:124-8.
8. Stansfield SK. Acute respiratory infections in the developing world: strategies for prevention, treatment and control. Pediatr Infect Dis J 1987; 6:622-9.
9. Harsten G, Prölner K, Heldrup J, Kalm O, Komfalt R. Acute respiratory tract infections in children: a three-year follow-up from birth. Acta Paediatr Scand 1990; 79:402-9.
10. Denny FW, Loda FA. Acute respiratory infections are the leading cause of death in children in developing countries. Am J Trop Med Hyg 1986; 35:1-2.
11. Baraff LJ, Bars JW, Fleisher GR, et al. Practice guideline for the management of infants and children 0 to 36 months of age with fever without source. Pediatrics 1993; 92:1-12.
12. Dowell SF, Marcy SM, Phillips WR, Gerber MA, Schwartz B. Principles of judicious use of antimicrobial agents for Pediatric upper respiratory tract infections. Pediatrics 1998; 101 (Suppl):163-5.
13. Rosentein N, Phillips WR Gerber MA, Marcy M, Schwartz B, Dowell SF. The common cold - Principles of judicious use of antimicrobial agents. Pediatrics 1998: 101 (Suppl): 181-4.