Causes and clinical aspects of fever in patients visiting primary healthcare

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Abstract

Objective: A better understanding of fever is important for effective management of illness in all ages. In this study, we explored the spectrum of causes and clinical aspects of fever in primary healthcare.

Results: Analyses of data derived from clinical presentations of 24,816 outpatient visits revealed that 5,285 visits (21.3%) were for fever. Half the patients with fever were children under 15 years old (50%), particularly among those under five (40.5%). Fever was more common among males (58.3%). The majority of patients presenting with fever (84.0%) were for respiratory tract disorders (upper = 62.4%, and lower=21.6%). Half of the patients with fever (50.0%) needed investigations to conclude the diagnosis. The majority of patients with fever were prescribed antimicrobial treatment (63%). Only 1.8% needed referral for further care, and counseling about the disease was almost neglected (.8%).

Thus the results revealed that fever is a common presenting symptom among outpatient visits. Respiratory tract infections are the commonest cause of fever. Primary health care physicians should pay more effort to educate the people about prevention and control of fever. This information will help the MOH planners to develop programs of organized, whole-population anticipatory care.

Key words: Fever, outpatient visits, respiratory tract infection

Introduction

People from all age groups are affected by fever. The age of the affected individual may also increase the intensity of manifestations associated with fever (1). Fever may be caused by any type of non-infectious or infectious etiologies, cancer, or even drug intake (2, 3). A high temperature and other clinical symptoms may indicate several serious illnesses or medical conditions. While the fever is a beneficial defense mechanism against infections, treating it does not worsen the outcome (4). Fever is the most common reason for consultations especially in the developing countries (5, 6). It is the cause of about 30% of healthcare visits by children and around 75% of adults with sickness (7). Approximately 5% of people who visit the emergency room have fever (8). Fever is common in intensive care, affecting around 70 % of the patients (9). Very few studies have been done on the epidemiology of fever in the health care centers (10 – 12). Thus the objective of this study was to assess the spectrum of causes of fever, and its clinical aspects in patients visiting outpatient clinics in primary healthcare.

Materials and methods

Design: A cross sectional study was undertaken
Setting: Outpatient clinics of two general hospitals; one in a relatively high socio-economic standard region, and the other in a relatively lower socio-economic standard region.

Sampling: The sampling technique was convenience type, and the total number of patients examined was 24,816 during a two year period (2017 – 2018).

Collection of data: Data were collected on the patients by specialists in the outpatient clinics, which included clinical history, anthropometric and vital signs assessments, clinical assessment (which included physical examination, diagnosis, investigations and management), and outcome of the visits.

Data analysis and statistical tests: Data were analyzed using the Statistical Package for Social Sciences (IBM SPSS, version 22, Armonk, NY: IBM Corp.). Chi square test of significance was employed. The level of significance for the study was 0.05.

Results

Out of the 24,816 outpatient clinic visits 5,285 visits (21.3%) presented with fever. Half the patients with fever were children under 15 years old (50%), with the highest frequency among children under 5 years of age (40.5%). Among 5285 patients with fever, males (58.3%: 3082/5285) were more common than females (41.7%: 2203/5285). Fever was significantly more common among patients from the Southern region compared to patients from the northern one (22.1 and 20.7% respectively). The majority of patients with fever (84.0%) visited outpatient clinics because of respiratory tract disorders (URTI= 62.4%, and LRTI=21.6%). Half of the patients with fever (50.0%) needed investigations to conclude the diagnosis. The majority of patients with fever needed antibiotics (63%), while one third needed symptomatic treatment (35%). Referral was done for very few cases (1.8%), while counseling about the diseases was almost neglected (.8%). A large proportion of patients presenting with fever to the outpatient clinics were encountered among those aged 1 – 5 years old (44%).These differences were statistically significant ($p < 0.05$). Among 5,285 oupatient visits, fever was significantly more encountered among females (23%: 2203/9742) compared to males (20%: 3092/15,074). Fever was more encountered among those residing in a LSE area (23%) compared to those living in a HSE area (21%). A large proportion of patients with fever didn't need investigation (27%); while 23% needed routine investigations and special investigations were ordered for 14% of the patients. The proportion of patients who presented with fever and who were admitted to hospital was 22.7% and those who were discharged (21.2%) were similar (Table 1) . Among all outpatient visits the majority of infectious diseases presented with fever (89.2%), followed by URTI (62.6%) and LRTI (30.3%). Table 2 shows the LRT disorders which presented with fever in the outpatient visits. The majority of cases with pertussis and croup (76% and 79% respectively) presented with fever. Almost half of the cases with bronchopneumonia and pneumonia (55.2% and 43% respectively) presented with fever. About one third of patients with Tuberculosis and bronchitis (35% and 33% respectively) presented with fever. These differences were statistically significant where $p < 0.000$. Table 3 displays the URT disorders that presented with fever. Influenza, tonsillitis and pharyngitis were the most common disorders that presented with fever (79%, 74% and 69% respectively). Common cold and OM were also commonly presented with fever to the PHC facilities (47% and 42% respectively). This difference was statistically significant where $p < 0.000$. Fever of unknown etiology accounted for 0.8%, dengue fever accounted for 0.59% and malaria accounted for 0.09%. Among all cases with fever, dengue fever accounted for 2.01%, while malaria accounted for 0.28%, while undiagnosed fever accounted for 3.8%.

Table 1: The Relationship between personal and environment characteristics and clinical aspects of all patients presenting with fever

Variables	Fever				Chi Square (p)
	Yes		No		
	Number	%	Number	%	
Age groups					
< 1 year	480	32.2%	1013	67.8%	
1 - 4 years	1177	44.0%	1501	56.0%	1780.979
> 5 to 14 years	994	33.5%	1971	66.5%	(< 0.000)
> 15 to 49 years	2363	16.9%	11628	83.1%	
> 50 years to 64 years	231	07.7%	2774	92.3%	
> 65 years	40	05.8%	644	94.2%	
Gender					
- Male	3082	20.4%	11992	79.6%	16.589
- Female	2203	22.6%	7539	77.4%	(< 0.000)
District					
- High socioeconomic status	3018	20.7%	11540	79.3%	6.728
- Low socioeconomic status	2267	22.1%	7991	77.9%	(< 0.009)
Investigation					
- No investigation	2646	27.0%	7148	73.0%	469.231
- Routine	1373	22.6%	4706	77.4%	(< 0.000)
- Specific	1266	14.2%	7677	85.8%	
Management					
-Symptomatic	6510	78.0%	1841	22.0%	176.9
-Therapeutic	11508	77.7%	3304	22.3%	(< 0.000)
-Counselling	469	92.0%	41	8.0%	
-Referral	1044	91.5%	97	8.5%	
Outcome					
- Discharged	4758	21.2%	17733	78.8%	2.872
- Admitted	527	22.7%	1798	77.3%	(< 0.090)

Table 2: Fever presentation among outpatient visits due to Lower respiratory disorders

Variables	Fever				Chi Square (p)
	Yes		NO		
	Number	%	Number	%	
- Acute respiratory failure	0	00.0%	2	100.0%	
- Asthma	154	14.6%	898	085.4%	
- Asphyxia	0	00.0%	1	100.0%	
- Bronchiectasis	0	00.0%	15	100.0%	
- Bronchiolitis	9	24.3%	28	075.7%	
- Bronchitis	586	32.8%	1199	067.2%	
- Broncho pneumonia	219	55.2%	178	044.8%	
- Cancer lung	0	00.0%	1	100.0%	
- COPD	3	12.5%	21	087.5%	
- Croup	58	79.5%	15	020.5%	
- DIPF	0	00.0%	1	100.0%	
- Hemothorax	0	00.0%	2	100.0%	
- Haemoptysis	0	00.0%	1	100.0%	407.870
- Pertussis	19	76.0%	6	024.0%	(< 0.00)
- Pleural effusion	0	00.0%	6	100.0%	
- Pleurisy	0	00.0%	26	100.0%	
- Pneumonia	84	42.9%	112	057.1%	
- Pneumothorax	0	00.0%	15	100.0%	
- Pulmonary oedema	1	06.3%	15	093.8%	
- Pulmonary embolism	0	00.0%	7	100.0%	
- Recurrent laryngeal nerve injury.	0	00.0%	1	100.0%	
- Respiratory distress syndrome	0	00.0%	4	100.0%	
- TB	7	35.0%	13	065.0%	

Table 3: Fever presentation among outpatient visits due to upper respiratory tract disorders

Variables	Fever				Chi Square (p)
	Yes		No		
	Number	%	Number	%	
-Allergic Rhinitis	32	18.8%	138	081.2%	
- Allergic sinusitis	11	18.3%	49	081.7%	
- Common cold	296	46.6%	339	053.4%	
- Epiglottitis	0	00.0%	14	100.0%	
- Epistaxis	1	16.7%	5	083.3%	
- Influenza	115	78.8%	31	021.2%	581.561
- OM	124	42.2%	170	057.8%	(< 0.00)
- Otitis externa	0	00.0%	22	100.0%	
- Pharyngitis	2153	69.5%	946	030.5%	
- Tonsillitis	564	74.0%	198	026.0%	
- Vertigo	3	05.1%	56	094.9%	

Discussion

Fever is the most common reason for visiting primary health care facilities in developing countries. However, still very few studies have been done to determine the epidemiology of fever in the health care centers (10, 11). To increase efficiencies and reduce costs, the government in KSA has actively explored private sector involvement in the development of the healthcare infrastructure in the Kingdom. About one third of the hospital-based services (33.05%) in KSA are conducted by the private sector. (12) Thus, the present study aimed at exploring the causes of fever and its clinical pattern among a large number of patients (24,816) visiting outpatient clinics of private hospitals in Jeddah, Saudi Arabia. In the present study the symptom of fever was encountered among 21.3% of all the visits. This is in line with previous studies which revealed that fever was the most common reason for consultations especially in the developing countries (5, 6, 13, 14). The symptom of fever in young children is one of the most common clinical signs managed by healthcare providers and is a frequent cause of parental concern. Fever in children may prove to be a diagnostic challenge as it is often difficult to identify the cause. In the present study 50% of the patients who showed fever were children under the age of 15; and those under 5 years old were most affected (40.5%). This is consistent with the findings reported by previous studies (13 – 16).

In the present study, fever was more common among males compared to females (58.3% and 41.7% respectively). This is in line with a study conducted by Salvi et al in India (13). On the other hand several previous studies revealed that a greater number of female patients visited the health care center with fever as a symptom compared to males (15, 17, 18). This has been attributed to social factors by other authors as males, in contrast to females, predominantly work outdoors and women are more likely to be covered due to the conservative Saudi dress code (19).

In the present study 84.0% of the patients with fever suffered from acute respiratory tract infection (ARTI). The upper respiratory tract infection accounted for 62.4% of the cases while LRTI accounted for 21.6%. This was in line with previous studies (10, 13, 15).

The present study revealed that among patients with fever 12.5% suffered from COPD. As these infections contribute considerably to the clinical course of the patient with COPD, they constitute a significant comorbidity in COPD. Recurrent acute infections by bacterial and/or viral pathogens are now clearly linked with the occurrence of exacerbations of COPD (20). Respiratory viral infections can have a significant influence on those patients with established asthma, where viral respiratory infections are found in association with asthma exacerbations in nearly 80% of these episodes (12). In the present study, 14.7% of the patients with fever had bronchial asthma.

The primary symptoms of croup are a “barking cough” and hoarseness and difficulty of breathing. Most children develop a fever, which may range from mild (38°C) to very high (40.5°C). In the present study fever was present in the majority of patients with croup (79.5%).

The incidence of pertussis has been greatly reduced by massive vaccination. Nevertheless, there is a significant increase in pertussis cases in older children, adolescents and adult people (22,23). In the present study fever was present in the majority of patients with pertussis (76%).

Pneumonia is the leading cause of death due to infection worldwide in children aged <5 years, and is responsible for approximately 16% of the 5.6 million deaths in a previous study (24). In the present study fever was encountered among 55.2% of children with bronchopneumonia and among 42.9% of cases with lobar pneumonia. An acute bronchitis patient presents with a productive cough, malaise, difficulty breathing, and wheezing. A low-grade fever may be present as well (25).

Moreover, in this study fever was present in only 32.8% of the patients with acute bronchitis. Thus, in the presence of fever the health care provider should examine the child or young adult carefully for the presence of pneumonia. Even in absence of fever, physicians should be suspicious about pneumonia and acute bronchitis when other symptoms like cough or difficulty of breathing present.

Dengue has been suggested to be the most important arthropod-borne viral infection of humans. It is endemic in Saudi Arabia; the presence of dengue in western coastal areas of Saudi Arabia and throughout the region of Makkah is clearly documented (2, 27). In the present study Dengue fever accounted for 0.9% of the total cases; fever was present in the majority of cases (74.1%). It was much higher than cases of malaria. The burden of malaria infection has been reduced over the past decades in many countries. In Saudi Arabia, malaria is confined to the southwestern parts of the country (28). Malaria was constrained mostly to foci in Aseer and Jazan regions (28). In the present study malaria accounted for 0.08% of the total cases; the majority of malaria cases presenting with fever (68.2 %).

Because of the recently developed advancement in diagnostic methods, true FUO is now much lower and uncommon in some developed countries. Fever of unknown etiology or origin (FUO) accounted for 0.8% of the total cases in the present study and constituted 3.8% of cases with fever, which is in line with other studies (29, 30). On the other hand, studies from France and India reported higher figures (17,18).

In the present study, the investigations were ordered for half of the patients with fever in order to fully conclude the diagnosis. This is in line with a previous study (17).

Excessive prescribing of antibiotics remains an important driver of antimicrobial resistance. The bulk of antibiotic prescribing occurs in primary care, with acute respiratory tract infections (ARTIs) representing the most common indication (31). In the present study, also, the majority of patients with fever (63%) received antibiotics. Although

ARTIs are often self-limiting and seldom require antibiotics for treatment, primary care clinicians have been found to overprescribe for a variety of clinical and, predominantly, non-clinical factors (32). The percentage of undiagnosed patients in this study was high which led to the low percentage of referrals (1.8%) and neglected counseling for the patients (0.8%). Thus, fever is a common presenting symptom among outpatient visits to private hospitals. It is particularly common among under 5 years old children particularly in low socioeconomic areas. Respiratory tract infections are the commonest cause of fever among outpatient visits in private hospitals. Patients visiting the primary health care facilities with fever may probably have respiratory infections, and the occurrence of respiratory infections may be much more common in the region of Saudi Arabia. Further studies are needed to determine the burden of respiratory infections in patients with fever in different regions of the kingdom. Primary health care physicians should pay more effort to educate the people about prevention and control of fever. This information will help the MOH planners to develop programs of organized, whole-population anticipatory care.

Limitations of this study

This study was based on a convenient sample so its generalizability is questioned. However, a large number of patients were studied, which makes this research a reliable exploratory study.

Ethical considerations

Ethical clearance was obtained from the institutional review board (IRB). Permission was obtained from the directors of the outpatient clinics for collecting data on the outpatient visits. In order to keep confidentiality of any information provided by study participants, the data collection procedure was anonymous.

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