The relevance of pyrexia in adults as a presenting symptom in the accident and emergency department

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SUMMARY

Over a 3-month period all adults presenting to the Accident and Emergency Department of St Mary's Hospital, Paddington, London, England, with a pyrexia of 37.6°C or more were entered into this study. A questionnaire was used to document the incidence of pyrexia, the age, sex, specific diagnosis and the subsequent management of pyrexial patients. A total of 11 062 adults came through the Department during this time, of whom 834 (7.5%) were admitted. One hundred and eighty-eight adults had a pyrexia of 37.6°C or greater and, of these, 62 (33%) were admitted. Seventy-two per cent of patients aged 45 years or older were admitted, compared with 22% in the younger age groups. These results were statistically significant for the correlation between likelihood of admission and age. This study demonstrates that, for patients presenting to an accident and emergency department, pyrexia is a useful indicator of illness which may necessitate admission, especially in the elderly.

INTRODUCTION

In the eighteenth century, fever was regarded as a disease in itself, rather than as a symptom of disease. However, following the development of an effective thermometer by Gabriel Daniel Fahrenheit and the introduction of the temperature chart by Professor Carl Wunderlen of Leipzig, it became apparent that a pyrexia could be found in many situations ranging from life threatening to insignificant, and its value as an isolated finding waned (Welsby, 1985). Although much is now known about the physiological changes which produce and occur in fever, it is still unclear whether it is functionally a 'friend or foe' (Cuhna, 1984; Editorial, 1977). An accident and emergency (A&E) department sees many hundreds of patients each week, most of whom will have

their temperature recorded. In some cases, fever is the cause of the patient seeking advice, while in others it may be discovered incidentally. Because of the plethora of situations in which it may occur, it is not immediately clear whether the finding of a pyrexia in a patient presenting to an A&E department is a useful indicator of the possibility of significant disease or whether the majority of such findings are merely incidental and trivial.

In order to try to answer this question, the authors identified the incidence and causes of pyrexia in adults presenting to the A&E Department of St Mary's Hospital over a 3-month period, and recorded the number admitted with a pyrexia.

METHODS

St Mary's is a busy central London teaching hospital, catering for a population with a large number of recently rehoused families, where few are registered with general practitioners. All individuals, 16 years of age or older, who presented to the A&E Department with an oral temperature of 37.6°C or greater (as recorded by the staff nurse on their admission card), were entered into the study, which was carried out over a 3-month period from November 1986 to January 1987. The authors chose 37.6°C as the cut-off because this is the temperature when consideration would normally be given to the suitability of prescribing an anti-pyretic. It was decided to exclude children from the study because of the high incidence in this age group of various exanthemata which are associated with a fluctuating pyrexia. The study was based on a questionnaire which was completed by the senior house officers working in the department for every patient presenting with a pyrexia of 37.6°C or greater. A diagnosis thought likely to be causing the illness was made on all the patients. When no firm diagnosis had been made, the notes of the patient were subsequently traced and the diagnosis confirmed or altered as appropriate. In the pyrexial patients, the relationship between age and admission to hospital was statistically assessed using the Chi-squared test for linear trend.

RESULTS

During the study period, 11 062 adults came through Casualty. Of these, 834 (7.5%) were admitted and 188 (1.7%) had a significant pyrexia (as defined above). Sixty-two (33%) of those with a pyrexia were admitted.

Table 1 shows the provisional diagnosis made in the A&E Department of those presenting with a pyrexia and the numbers admitted. Of those initially diagnosed as a pyrexia of unknown origin, two had a final diagnosis of pneumonia, one of a deep vein thrombosis, one of influenza, and three remained as pyrexia of unknown origin. None of the other diagnoses required subsequent amendment.

Figure 1 and Table 2 show the sex and age range of the 188 patients in the study. Although the numbers are relatively small, it can be clearly seen that adults in the older age groups with a pyrexia were more likely to be admitted than the younger adults.

Table 1 Diagnoses of patients presenting with a pyrexia of 37.6°C or greater (those admitted are in brackets)*

Abscess	5	(4)	Miscarriage	1	(1)
Appendicitis	6	(6)	Malaria	3	(0)
Ascending cholangitis	1	(1)	Musculo-skeletal pain	1	(0)
Bursitis	1	(0)	Otitis media	3	(0)
Cellulitis	6	(4)	Ovarian cyst	2	(2)
Chronic cervicitis	1	(0)	Pharyngitis	1	(0)
Chest infection/Pneumonia	37	(15)	Pyrexia of unknown origin	7	(6)
Chickenpox	1	(0)	Pericarditis	2	(1)
Deep vein thrombosis	2	(2)	Pyelonephritis	10	(5)
Epididymo-orchitis	1	(0)	Pelvic inflammatory disease	3	(1)
Erysipelas	1	(0)	Quinsy	2	(2)
Gastroenteritis	6	(1)	Septic arthritis	2	(2)
Head injury	1	(0)	Sickle cell crisis	1	(1)
Intestinal obstruction	1	(1)	Tonsillitis	18	(0)
Measles	2	(0)	Urinary tract infection	21	(4)
Meningitis	1	(1)	Viral illness	37	(2)
Mesenteric adenitis	1	(0)			

*Total no.: 188; admitted: 62.

Fig. 1 Histogram comparing the total number of patients (male and female) presenting with a pyrexia in each age group (open bars), with the number of pyrexial patients admitted (cross-hatched bars).

Table 2 Adults with a pyrexia of 37.6°C or more presenting to St Mary's Accident and Emergency Department (November 1986 to January 1987)

Age (years)	Females			Males		
	Total no.	No. admitted	Percentage	Total no.	No. admitted	Percentage
16-24	44	13	30	31	3	10
25-44	41	11	27	33	7	21
45-64	13	8	62	8	5	63
65-74	5	4	80	7	5	71
75>	4	4	100	2	2	100
Total	107	40	37	81	22	27

Table 3 Pyrexial patients: the relationship of age to hospital admission

Age	Females	Per cent	Males	Per cent
16-24	13/44	30	3/31	10
25-44	11/41	27	7/33	21
45 +	16/22	73	12/17	71
Overall X^2 (2)	14.84	$P < 0.001$	21.57	$P < 0.001$
X^2 linear trend (1)	8.75	$P < 0.01$	18.18	$P < 0.001$

() = Degrees of freedom.

Table 3 demonstrates that, in adults over 45 years of age, approximately three-quarters of the patients were admitted, while only about one quarter of the younger adults were admitted. Statistical analysis using the Chi-squared test confirms that the linear trend is significant for men ($P < 0.001$) and women ($P < 0.01$).

DISCUSSION

Relatively few studies have been carried out to determine the importance of pyrexia as a presenting complaint. Diseases are constantly changing, so it seems necessary to periodically analyze the diseases which produce a pyrexia. This study identified the incidence and causes of pyrexia presenting to A&E. It was interesting that the group of 188 patients accurately reflected the very broad range of conditions which may present with a fever. The traditional link between fever and infection has been confirmed by several studies (Gould, 1983; Berheim *et al.*, 1979; Smith, 1986). Over 90% of our patients had fever of an infectious cause.

A high proportion of pyrexial patients were admitted, 33% compared to 7.5% for all adult patients presenting to the department during this time. In all age groups of patients with pyrexia at presentation, the proportion admitted was greater than 7.5% (Table 2). Furthermore, the importance of pyrexia as a presenting symptom increased with age, so that for adults over 45 years of age it became a significant predictor of admission to hospital. This study thus supports the value of routine temperature recording in the A&E department, and demonstrates its usefulness in suggesting the possibility of significant underlying illness in all age groups of patients, especially in adults over 45 years of age.

The study also highlights one of the problems which an inner city A&E department faces; namely, over-use by individuals who could be adequately managed by their general practitioner. Only 14% of the patients with a pyrexia in this study had been seen by their general practitioner with their current complaint. After consideration of the diagnoses presented in Table 1, the authors felt that 48% of the patients with a pyrexia could have been adequately treated by their GP.

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