

Fever Attribution in the SARS Outbreak

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ABSTRACT

Fever as a somatised symptom is not commonly described. We report a patient who complained of recurrent unexplained “fevers” during the severe acute respiratory syndrome (SARS) outbreak in Singapore. The presentation, while likely to be peculiar to the outbreak, posed challenges and difficulties to the primary care doctors. Investigations did little to allay her anxiety. Instead, appreciating the psychosocial backdrop and how the SARS outbreak affects patient and doctor may be useful.

Keywords: Somatisation, unexplained fever, severe acute respiratory syndrome (SARS) outbreak, depression, primary care

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HISTORY

A 48-year-old teacher was first seen by her family doctor in April 2003, which was at the height of the severe acute respiratory syndrome (SARS) outbreak in Singapore⁽¹⁾. Mandatory temperature monitoring was instituted for teaching staff during that time, and she was discovered in many instances to have raised body temperature of more than 37.5°C during the screening procedure and thus sent home to see her doctor. Her doctor ordered various blood and urine tests during the encounters to elucidate the cause of the fever but none had shown evidence of infection. She was treated empirically with anti-pyretics and several courses of antibiotics over two months. She was finally referred by a friend to see one of the authors on 16 June 2003.

At first contact, the patient gave a history of recurrent “fever” despite treatment and a significant weight loss of three kilograms. She also expressed her concern that the recurrent fever could be due to the possibility that she could be harbouring the SARS virus, and complained of insomnia as a result. Physical examination did not reveal any significant finding. At the time of the consultation, she was afebrile. Blood tests for free thyroxine and thyroid stimulating

Table I

| Date | Temperature readings according to time of day | | |
|--------|---|------|------|
| | 8 AM | 2 PM | 8 PM |
| 10 Jun | 37.0 | 37.2 | 37.0 |
| 11 Jun | 37.7 | 37.4 | 36.6 |
| 12 Jun | 36.4 | 37.3 | 37.0 |
| 13 Jun | 37.1 | 37.4 | 36.7 |
| 14 Jun | 36.8 | 37.0 | 37.0 |
| 15 Jun | 37.0 | 37.5 | 37.0 |
| 16 Jun | 37.0 | 37.2 | 36.9 |
| 17 Jun | 36.6 | 37.2 | 36.8 |
| 18 Jun | 36.7 | 36.9 | 36.8 |
| 19 Jun | 36.7 | 37.7 | 37.0 |
| 20 Jun | 37.2 | 37.4 | 36.9 |
| 21 Jun | 37.0 | 37.5 | 37.0 |
| 22 Jun | 36.6 | 37.2 | 37.2 |
| 23 Jun | 37.1 | 37.3 | – |

hormone were done. The patient was instructed to chart her body temperature taken the preceding week and into the subsequent week.

She was reviewed one week later on 23 June 2003. Her temperature chart was as shown in Table I. The temperature readings were not more than 37.7°C and showed a normal diurnal variation with higher temperature in the afternoon. The thyroid function tests were normal. She was given the assurance that she had neither fever nor SARS symptoms. A letter was written to certify her condition, so that should her temperature be flagged “high” at any point of screening, she could produce that letter and her temperature chart for verification. In view of her considerable agitation and concern over her condition, she was prescribed alprazolam 0.5 mg twice a day.

The patient returned for review 10 days later on 3 July 2003. She now complained of “a lump in the throat”. On further probing, she revealed her true concerns. She was married to an academic who held a

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university teaching post outside Singapore for the past two years, coming back for short visits every few months. Three months ago, the patient's husband revealed he had a romantic relationship with a female colleague at that university and asked for a divorce. The patient refused to sign the legal documents even though she was offered possession of all the material assets in Singapore. From the time she was told of her husband's infidelity, she had difficulty sleeping at night. In the day, she would focus on her teaching but at night, she would cry uncontrollably when alone. She also felt compelled to call her husband nightly, who was then overseas, but only to "spend thirty minutes just crying on the line" while her husband listened in silence. During this period of time, she had poor appetite and so lost three kilograms in body weight. Apart from the time spent at work, she would ruminate about her situation and did not feel like going out elsewhere. Cognitively, she could not get over the idea that her husband was having an affair and wanted to divorce her. There was no suicidal ideation, although she thought her recurrent "fever" was evidence that she may be harbouring the SARS virus and that she might actually die from it.

The diagnosis was thus revised to one of depression. She was started on paroxetine 20 mg ON. On review a month later, she was feeling better until her husband returned and again pressured her to sign the divorce papers. She was then referred for counselling by professional counsellors. She continued to see the doctor. The issue of "fever" however, stayed resolved.

DISCUSSION

The outbreak of severe acute respiratory syndrome (SARS) in Singapore started at the beginning of March 2003, when the index patient, a previously healthy 23-year-old lady returned from Hong Kong after a vacation where she stayed in the same hotel as a SARS-infected individual⁽¹⁾. In the subsequent months, as the reality of an outbreak of a potentially fatal disease sank in, the nation was put on alert, and daily, sometimes hourly messages of disease updates and disease prevention were made known to the populace through the various media. Significant changes in lifestyle occurred: schools were closed at the beginning of the outbreak; people were quarantined in their homes when they have contact with the infected; and body temperature taking became the routine at workplaces, schools and various public places. The impact of SARS on the people was felt at almost every level of the population.

The symptom of fever became a major national

preoccupation. Compulsive daily body temperature measurement was instituted. The national strategy to detect and isolate possible SARS patients utilised body temperature as a crude parameter to determine who needed further clinical assessment. As a by-product of this strategy, having a raised body temperature had many social implications, such as being barred from school, from work, from certain buildings and from public places. In the early stage of implementation of this mass temperature screening exercise, the figure of 37.5°C was used as the upper limit of normality. The lack of awareness of confounding factors such as diurnal variation and outliers further resulted in many persons including teachers and students being sent to doctors for clinical screening for fever. The cut-off point was later revised to 37.9°C (see later discussion). It was in this context that this patient presented.

The "fever", in this case, turned out to be medically unexplained, as repeated examinations and all the blood tests done could not show any indication of a septic process. Fever has not been reported in the literature as one of the commonly known "somatised" features. This can however be explained by the processes involved in symptom presentation. The first step is the perception of a symptom, which may be created neurophysiologically. The next step involves the interpretation of the symptom according to the patient's beliefs, attitudes, knowledge and experiences with regard to what constitutes a disease. In the third step, the patient decides whether there is a need to consult the doctor, the process of which takes into consideration what the prevailing cultural practice is regarding seeing the doctor. And finally, the interaction with the doctor may result in expression, or suppression of the symptom⁽²⁾.

When this model is applied in the context of SARS and the surrounding social circumstances, it was obvious that there was a strong pressure not only to complain of fever based on her misperception of excessive warmth, but also to misattribute it to SARS. It is also important to realise that all these were of course socially sanctioned at the time of her presentation (There was daily media advice to "see your doctor" when one has fever). In the same way, there was also pressure for the doctor to accept the complaint as a valid reason for consultation.

The possible reasons behind the somatic presentation are worth mentioning. In one study, 29% of patients with depression and anxiety present with physical symptoms⁽³⁾. The propensity for this patient to somatise may depend in part on the patient's own characteristics. Stressful life events too,

like this patient's impending divorce, can precipitate medically unexplained physical symptoms⁽⁴⁾. It can also be argued that she did have cause for secondary gain to present with physical symptoms. In this case, SARS may be seen as an attempt to salvage the marital situation, or as an excuse for failure (media accounts were replete with examples of families and friends coming together when an individual had SARS). On the other hand, developing a serious illness may also fit into the negative cognition and fatalism in a depressed patient. And not least, the appearance of somatic symptoms following social crises, upheavals, threats or natural disasters is a known phenomenon^(5,6).

The problem with "fever" in general practice

Despite the fact that temperature taking is a most commonly done procedure in medical practice, the confirmation of fever may be challenging in certain situations. Certainly, a markedly raised temperature poses no problem in confirming "fever". However, there are some characteristics of body temperature that present grey areas in the lower temperature ranges. Firstly, there is no one single value of body temperature beyond which we can pronounce someone as having fever. The body temperature has a circadian rhythm, such that the maximum oral temperature at 6 am is 37.2°C, while the maximum oral temperature at 4 pm is 37.7°C. This morning low and evening high variation is also seen in febrile conditions⁽⁷⁾. Secondly, the body temperature varies with the site of measurement. For example, axillary and forehead temperatures are likely to be lower than the tympanic or oral temperatures.

Thirdly, the normal temperature can also vary in certain subsets of normal people, such as pregnant ladies and women at ovulation⁽⁷⁾. Young infants are also known to have higher body temperatures, even up to 38.2°C at certain age ranges⁽⁸⁾. The press reported a young child who was barred from school because of a higher body temperature despite the apparent absence of disease. Her father resorted to multiple blood tests and finally a hospital admission before she was reinstated back to school⁽⁹⁾. The health ministry eventually increased the level beyond which a child would be considered febrile from 37.5°C to 37.9°C, in view of the observation of similar cases of well children with body temperatures slightly above 37.5°C^(10,11). Stress has also been postulated to be able to raise body temperature⁽¹²⁾.

Fourthly, the instrument and technique used to measure body temperature can generate more "grey areas". An instrumental or procedural error of

0.5°C, for example, may make a difference, although arbitrary, between one who is 'normal' with a temperature of 37.6°C or one with significant fever of 38.1°C, based on the WHO criteria for suspected SARS case. The national measurement authority, SPRING Singapore, has tested seven different types of thermometers, and found the oral thermometer to be most accurate (+/- 0.1°C). And while the popularly used ear thermometer has an accuracy of 0.2°C, a torn or soiled plastic cover can cause deviations of up to 3°C⁽¹³⁾.

And as a further confounding factor, some patients self-medicate with over-the-counter antipyretic medication prior to seeing the doctor. The history of raised temperature would then be the only indicator of a febrile illness by the time of the consultation.

To make matters more uncertain, there were initial suspicions that some SARS cases did not present with the usual high fever. One case was seen at a local clinic five times before being sent to hospital because of its subtlety in presentation⁽¹⁴⁾. Rainer later provided more data from Hong Kong to show that the WHO criteria of a suspect case (one with close contact, and a fever of more than 38°C, and respiratory symptoms such as cough and breathing difficulty), is more specific (96%) than is sensitive (26%). In the early stages of SARS, the main discriminating symptoms were not cough and breathing difficulty but fever, chill, malaise, myalgia, rigors and possibly abdominal pain and headache. Documented fever of more than 38°C in the early stages was noted to be uncommon⁽¹⁵⁾.

The implications to primary care doctors

Doctors in the primary care setting were not immune to the impact of SARS. One of the over-riding concerns at the primary care setting was not to misdiagnose a case. Even before SARS, doctors already feared missing the diagnosis when encountered with patients with unexplained somatic presentation^(16,17). As one doctor aptly wrote:

"I've noticed my habits are changing, as the years go by, that I am in fact sometimes over-investigating just to make sure, as a safety net, just to make sure you're not missing anything. You've been caught out so many times with little things that you tend to worry a little bit about the litigation. You err on the side of caution. I do feel that pressure, because occasionally something turns up and you think oh God, I'm glad I did that. So the fear is there. But that's the way medicine is going now⁽¹⁷⁾."

The outbreak of SARS and the difficulties mentioned earlier no doubt accentuated this defensive attitude. And besides the professional and

medico-legal consequences of misdiagnosing a SARS patient, the doctor has to grapple with the personal implications to himself and his family should he come in contact with a SARS patient. The “climate of fear”, wrote a local GP, led a minority of doctors to reduce clinic operating hours, and even not to see high-risk patients⁽¹⁸⁾.

Investigations did not reassure the patient

While it may indeed be necessary for investigations to be carried out in the diagnostic process, it was apparent that the investigations and courses of antibiotics over the initial two months of presentation did little to assuage this particular patient's anxiety over fever and SARS. This is consistent with findings in other settings, where anxious patients who have health concerns are not assuaged by the normal results from such investigations as gastroscopy or echocardiography⁽¹⁹⁻²¹⁾. McDonald also alluded to certain “wild card effect”, which he described as unpredictable circumstances or occurrences, including media reports that can make patients more resistant to reassurances⁽²⁰⁾. This was also highly possible in our patient because at the time of her complaints, there were daily reports in all the media about the lives and deaths of SARS victims. However, even in the absence of such wild card effect, the reason why the tests had not worked for this patient can also be understood in terms of the process of negative reinforcement – because reassurance brought temporary relief, the subsequent absence of relief encourages the anxious patient to engage in more health-seeking behaviour.

As for the doctor, a similar cognitive concept also applies – the positive response from the patient (i.e. initial relief on hearing a negative result) and from himself (i.e. relief it was NOT SARS) might encourage him to engage in more reassurances through investigations by the process of positive reinforcement. In other words, the situation could set up a colluding relationship between the patient and doctor, based on their individual anxieties and concerns. This combination of seeking help and reassurance could have gone on indefinitely, at the risk of iatrogenesis and increasing the patient's anxiety by the above processes.

The “recurrent fever” only stopped when this patient's real issues were addressed. This happened when the patient's psychosocial domains were further explored. Only then were the issue of divorce and her depressive symptoms revealed. The use of fever charting turned out to be a diagnostic as well as “therapeutic” cognitive-behavioural exercise. A month after antidepressants (paroxetine 20 mg)

were started, the patient had shown improvement in both the depressive symptoms and unexplained somatic complaints⁽²²⁾.

CONCLUSION

This case describes a patient with the somatic complaint of recurrent fever during the SARS outbreak in Singapore. While the process of somatisation is unlikely to be different from others, the content, which involved fever attributed to SARS and the accompanying fear of SARS, is probably peculiar to the time of the SARS outbreak. Appreciating the psychosocial backdrop of the presentation and being able to look beyond the physical symptoms are important skills for the primary care doctor. It is also useful to be alert to underlying anxiety and depression in patients who present with medically unexplained somatic complaints. While investigations may be imperative to elucidate the diagnosis, their use as a sole mode of reassurance may be futile. The human interaction, based on patient-centeredness, remains the mainstay in managing her problems, whether SARS or otherwise⁽²³⁾.

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