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Severe acute respiratory syndrome (SARS): Knowledge, attitudes, practices and sources of information among physicians answering a SARS fever hotline service

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Summary In June 2003, Taiwan introduced a severe acute respiratory syndrome (SARS) telephone hotline service to provide concerned callers with rapid access to information, advice and appropriate referral where necessary. This paper reports an evaluation of the knowledge, attitude, practices and sources of information relating to SARS among physicians who staffed the SARS fever hotline service. A retrospective survey was conducted using a self-administered postal questionnaire. Participants were physicians who staffed a SARS hotline during the SARS epidemic in Taipei, Taiwan from June 1 to 10, 2003. A response rate of 83% was obtained. All respondents knew the causative agent of SARS, and knowledge regarding SARS features and preventive practices was good. However, only 54% of respondents knew the incubation period of SARS. Hospital guidelines and news media were the major information sources. In responding to two case scenarios most physicians were likely to triage callers at high risk of SARS appropriately, but not callers at low risk. Less than half of all respondents answered both scenarios correctly. The results obtained suggest that knowledge of SARS was generally good although obtained from both medical and non-medical sources. Specific knowledge was however lacking in certain areas and this affected the ability to appropriately triage callers. Standardized education and assessment of prior knowledge of SARS could improve the ability of physicians to triage callers in future outbreaks.

Introduction

The first known case of severe acute respiratory syndrome (SARS) in Taiwan was hospitalized in early March 2003, which elicited several public health initiatives aimed at containing the outbreak. The initiatives included: formation of a SARS taskforce; enhanced case surveillance; quarantine of contacts and travellers from SARS-affected areas; innovative ways of expanding isolation areas; institution of fever screening clinics at all health care facilities; a population-wide fever screening campaign; and a dedicated SARS fever hotline.[1–4] The SARS fever hotline, staffed by physicians, was introduced in June 2003 to advise callers regarding SARS, and refer them to appropriate healthcare service when necessary.

This survey describes the knowledge, attitudes, practices and sources of information of physicians who answered calls to a SARS fever hotline during the SARS outbreak in Taipei, Taiwan, and discusses recommendations for improving the effectiveness of such interventions in future outbreaks.

Materials and methods

Context

In Taiwan, a campaign that encouraged people to measure their body temperature twice daily was initiated. The overall objective was prompt recognition of persons at high risk for SARS, thereby limiting the risk of possible transmission to others. In conjunction with this campaign, persons with fever or other features associated with SARS were encouraged to call a dedicated SARS fever hotline, which began operating on June 1, 2003. The purpose of the fever hotline was to prevent unnecessary visits to hospital and clinics. The hotline had a toll-free number and was staffed by physicians from the local medical association working 6-hour shifts between 8:00 a.m. and 10:00 p.m. Physicians triaged calls using an algorithm developed by members of the local medical association.

Self-administered questionnaire

We conducted a cross-sectional survey of the 52 physicians in Taipei city, Taiwan who had staffed the SARS fever hotline during June 1–10, 2003. A self-administered questionnaire was developed, that consisted mainly of items in the form of a Likert-scale and multiple-choice questions. The questionnaire included questions related to respondent demographics; SARS information source; knowledge about SARS; attitude towards, and beliefs about the hotline; and scenarios on referral practices. The questionnaire was developed in English, piloted, and translated into Mandarin Chinese, with translation and backtranslation being undertaken independently by bilingual public health professionals.[5] Questionnaires were sent to the physicians on July 9, 2003. Telephone reminders were made on July 16,

and July 22. These were followed by a postal reminder to non-responders on July 25.

Correct answers were based on a review of the available literature as well as policies and guidelines produced by the World Health Organization (WHO), Center for Disease Control, Taiwan (CDC-TW) and Centers for Disease Control and Prevention, USA (CDC-US) at the time of the survey.

Results

The response rate of the survey was 83% ($n=43$). All respondents were currently practicing physicians and came from a variety of medical specializations including pediatrics, internal medicine, surgery, obstetrics and gynecology and family practice. Most (37/42, 88%) were male and the majority of respondents (31/42, 74%) had graduated from medical school at least 15 years earlier. Approximately three quarters (33/42, 79%) of respondents worked 1–3 shifts during the survey period.

Knowledge about SARS

Most respondents (34/43, 79%) indicated that they had received training or lectures about SARS (Table 1), and rated their knowledge of SARS as either very good (6/43, 14%) or good (25/43, 58%).

All respondents correctly identified the Coronavirus as the causative agent of SARS when presented with a list of options. At least 90% of respondents recognized that breathing difficulty, exposure to a SARS-affected area, fever >38 °C, cough, and exposure to a SARS patient were all associated with SARS. Approximately half (22/41, 54%) of the respondents knew the incubation period of SARS was 2–10 days. Most respondents were protecting themselves from SARS by frequent handwashing (42/43, 98%) and following infection control guidelines (38/43, 88%), however, none of the respondents was taking his temperature twice daily.

Attitudes towards and beliefs about the SARS fever hotline

Almost all respondents thought that a dedicated SARS fever hotline was a good idea (41/43, 95%) and that the fever hotline was a useful source of SARS advice for the public (42/43, 98%). Most respondents (40/43, 93%) thought that physicians were the most appropriate persons to answer calls to the fever hotline, compared with nurses (3/43, 7%). In addition, 63% (27/43) said they would work on the fever hotline again in the event of another outbreak.

Table 1 Knowledge related to SARS among physicians staffing a SARS fever hotline—Taipei, Taiwan, June 2003.

	n	%
Had ever received training or lectures about SARS	34	79
Self-rating of knowledge about SARS		
Very good	6	14
Good	25	58
Average	12	28
Poor	0	0
Very poor	0	0
Knew causative agent of SARS	43	100
Recognized features associated with SARS		
Breathing difficulty	42	98
Exposure to SARS-affected area	42	98
Fever >38 °C	43	100
Cough	41	95
Exposure to SARS patient	40	93
Did not recognize feature not associated with SARS		
Ear pain	2	5
Knew incubation period of SARS (2–10 days)	22	54

Sources of information about SARS

A variety of sources were used to obtain information about SARS (Table 2). Hospital guidelines (33/43, 79%) and the news media (79%) were the most frequently cited sources. The CDC-TW and WHO websites were used by 65% (28/43) and 49% (21/43) of respondents respectively. Only

Table 2 Sources used by physicians to obtain information on SARS[a]—Taipei, Taiwan, June 2003.

Sources of SARS information	*n*	%
Hospital guidelines	34	79
Newspaper/radio/TV	34	79
CDC-Taiwan website	28	65
WHO website	21	49
Colleagues	20	47
CDC-USA website	17	40
Other web-based source (Medline, etc.)	16	37
Journals	15	35
Friends/family	5	12
Other	5	12

[a] More than one information source could be selected by each respondent.

one-third of respondents (15/43, 35%) obtained information from medical journals.

Practices:

Triage and management of callers to the SARS fever hotline

Respondents were presented with two scenarios. In the first scenario respondents were asked about a person at low risk for SARS. They were asked what questions they would ask someone who had called the fever hotline with a temperature of 37.8 °C and a dry cough (Table 3).

Fifty-six percent (24/43) of respondents identified all of the correct questions to ask. Respondents were then asked about a person at high risk for SARS. They were asked to triage a person calling about her spouse who had recently been in Beijing, and now had a fever of 39.5 °C and shortness of breath. Most respondents (33/42, 79%) correctly chose the advice for persons at high risk for SARS. Forty-nine percent (21/43) of physicians answered both scenarios correctly.

Discussion

Although SARS has previously been investigated in several countries, to the authors' knowledge this is the first published survey of physicians' knowledge and practices regarding SARS, and their sources of information.

Most physicians' were confident in their knowledge about SARS and most knew the signs, symptoms and risk factors for SARS. Approximately half knew the incubation period and a similar percentage could correctly triage callers over the telephone. Physicians were equally likely to obtain medical information about SARS from non-medical sources and medical sources.

The median incubation period for SARS-CoV appears to be approximately 4–6 days, however

Table 3 Physicians' practices triaging callers to the SARS fever hotline—Taipei, Taiwan, June 2003.

		n	%
Scenario 1 A person with a temperature of 37.8 °C and a dry cough. What do you ask the caller to do?			
1[a]	How was the temperature measured?	40	93
2[a]	Have they been wearing a mask when not at home?	29	67
3[a]	Have they been in contact with a SARS patient?	41	95
4[a]	Have they travelled out of Taiwan recently?	39	91
5	Nothing. Tell them to monitor symptoms and stay at home for three days	4	9
6	None of the above	0	0
Scenario 2: A person calls about her spouse who was recently in beijing, who now has a fever of 39.5 °C, and who is short of breath. What do you advise the caller to do?			
1	Tell the caller to take her spouse to a fever clinic and to make sure her spouse wears a mask	22	51
2[a]	Tell the caller to call 119 (emergency services), ask for an ambulance and make sure her spouse is wearing a mask	33	79
3	Tell the caller to give her spouse an aspirin and see if the fever improves	0	0
4	Tell the caller to make sure her spouse stays at home and monitor symptoms for 3 days	0	0
5	None of above	0	0

[a] Indicates correct answers.

most patients become ill within 2–10 days after exposure.[6,7] This is important information when evaluating fever in persons who might be at risk of transmitting or having SARS as it forms the basis for many recommended control measures, including contact tracing and the duration of home isolation. Not knowing the incubation period may have led the physicians to inappropriately triage persons with fever. In addition, there was a disparity in the level of knowledge among the hotline staff. The variety of medical and non-medical sources of information about SARS may have been responsible. Research has shown that staff providing telephone advice should have the appropriate knowledge and training to deal with calls.[8] Standardized education and competency training before staffing the hotline would improve the quality of information provided by hotline physicians. Physicians obtained their information about SARS mainly from hospital guidelines and the news media. It is possible that the information from either or both of these sources was incorrect. An evaluation of the content of the news media and the hospital guidelines is beyond the scope of this study, but is an area of potential future research.

Less than half of the respondents would have dealt with both clinical scenarios appropriately using the standardized algorithm. The algorithm was distributed to the physicians without prior training. Poor triaging may be due to an incorrect algorithm or lack of training in how to use it correctly.

The physicians in this study thought that the fever hotline was a valuable activity and this is consistent with previous research. Telephone helplines are viewed as useful resources as they can be set-up at short notice to deal with large-scale health incidents, where case-finding is required or people need information or queries answered.[8] They can also provide an opportunity to correct misconceptions and provide reassurance. Furthermore, telephone triage has been shown to be an effective means of managing demand for healthcare as it can be used to provide patient information, patient education and provide guided access to appropriate healthcare.[9,10]

There are a number of limitations to this study. Firstly, the survey relied on self-reporting and may therefore not truly reflect practice. Secondly, the results are based on small numbers. However the response rate was high at over 80%. Thirdly, although the questionnaire was translated and back-translated, linguistic or cultural differences may have led respondents to misunderstand a number of questions.

Conclusion

This evaluation demonstrates that physicians staffing the SARS fever hotline had good overall knowledge of SARS but lacked knowledge in several important areas. Standardized education about the disease, assessment of knowledge before staffing the hotline, and training in telephone triaging and the use of algorithms will likely improve hotline quality of this service for the future.

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