ORIGINAL ARTICLE

Change in Infection Control Practices and Awareness of Hospital Medical Staff in the Aftermath of SARS

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Summary

Severe Acute Respiratory Syndrome (SARS) epidemic illustrated the crucial role of infection surveillance and control measures in the combat of any highly transmissible disease. We conducted an interview survey of 121 medical staff [45 doctors, 46 staff nurses and 30 medical assistants] in a state hospital in Malaysia three months after the end of SARS epidemic (from October to December 2003). Staff was grouped according to those directly involved in the care of suspected SARS patients [S+ group n=41] and those who were not [S- group; n=80]. On hand washing following sneezing, coughing and touching patients, the proportions of medical staff that reported an increase after the SARS crisis were 22.3%, 16.5% and 45.5% respectively. On wearing masks, gloves, and aprons when meeting potentially infectious patients, the proportions that reported an increase were 39.7%, 47.1% and 32.2% respectively. Significantly more staff in S+ than S- group reported these increases. Sixty percent of staff was aware of changes in hospital infection control policies after SARS; 93.4% was aware of notifying procedures, and 81.8% was aware of whom to notify in the hospital. Regarding infection isolation ward, Infectious Control Nurse and Infection Control Committee Chairman in the hospital, the proportions of staff that could correctly name them were 39.7%, 38.3% and 15.7% respectively. Significantly more in S+ than S- group could do so. However, more than half the staff claimed ignorance on the knowledge of infection isolation ward (56.2%), Infection Control Nurse (57.9%) and Chairman (65.3%). Our findings demonstrated that SARS crisis had some positive impact on the infection control practices and awareness of medical staff especially on those with direct SARS involvement. Implications for future control of infectious diseases are obvious.

Key Words: Severe Acute Respiratory Syndrome, SARS, Infection control, Malaysia

Introduction

On July 5, 2003, World Health Organization (WHO) declared that Severe Acute Respiratory Syndrome (SARS) had been contained around the world, with no new cases reported by any country since June 15. With this, the Ministry of Health Malaysia ordered the twenty-one SARS-designated wards in Malaysian hospitals to resume their original duties[1]. This signaled the end of a battle of unprecedented global scale against a new infectious disease caused by a novel coronavirus, affecting more than 30 countries and regions, with a cumulative total of 8437 cases and 813 deaths [2,3].

In Malaysia, the total accumulative cases of 'probable' SARS that were reported were only 5, with the last case reported on April 24. All 'probable' cases were contracted outside Malaysia, and there was no evidence of local transmission of SARS[1]. The success of SARS containment in Malaysia and elsewhere was hugely attributed to the stringent infection control precautions in healthcare institutions, broad isolation measures in affected communities and international surveillance with barrier restrictions to travel [4,5,2].

During the period between March and July 2003 in Malaysia, healthcare workers in government designated

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SARS hospitals and in communities, under the directives from the Ministry of Health Malaysia, instituted stringent infection control measures that included use of protective masks, and personal protection equipment when dealing with suspected SARS patients, isolation and surveillance procedure in hospitals, health clinics and within communities, and other standard hygiene precautions like hand washings. An estimated 9368 government healthcare personnel were involved during this time [1].

Since the end of the SARS epidemic, WHO has maintained its call for vigilance on infection surveillance and control. Many of these measures are in fact the standard requirements for any infection control. The SARS crisis had only served to alert governments and healthcare professionals of any such deficiencies, if any, in infection control in their own countries and hospitals. No study to date, to our knowledge, has examined if individual practices and awareness level relating to hospital infection control has changed in the aftermath of SARS. For this purpose, we conducted an interview survey among the medical staff in a SARS-designated state hospital in Malaysia. We also studied if the impact of SARS is different between staff who were directly involved with suspected SARS patients and those who were not. The study was carried out three months (from October to December 2003) after the WHO declaration of the end of SARS in early July 2003.

Materials and Methods

Information on the details and number of medical staff directly involved in the care of suspected SARS patients from the period of March to July 2003 was first sought via Hospital Director Office. We defined 'direct involvement' as having direct encounters with patients with suspected SARS beginning from the screening triage in Accident and Emergency department, to the transport of patients to isolation wards, to involvement of their medical and nursing care, and to their final discharge from the hospital. The medical staff enlisted were doctors of all grades, staff nurses and medical assistants.

A structured questionnaire form that encompassed questions on individual practices (washing hands, wearing masks, gloves and apron) and awareness level on matters relating to hospital infection control and policies, was developed. Based on the questionnaire, a personal interview that lasted less than 5 minutes was conducted by the investigators [AC, THA, AMA] with each of the medical staff recruited. Another group of doctors, nurses and medical assistants (twice the number of the medical staff directly involved with suspected SARS patients) randomly selected from the hospital, was also interviewed for comparison.

The data collected were analyzed according to SARS-involved and non-SARS-involved groups. Differences between SARS-involved and non-SARS-involved medical staff were assessed using Chi Square tests. All computation was made using statistical package SPSS version 11.5 for Windows (Chicago, Illinois, USA). In all cases, the significance was defined at the 5% level.

Results

A total of 121 medical staff was successfully interviewed. Forty-five of them were doctors (7 specialists/consultants, 27 medical officers and 11 house officers), 46 were staff nurses and 30 were medical assistants. Of these, 41 medical staff was directly involved in the care of suspected SARS patients (SARS-involved group) while 80 were not directly involved (non-SARS-involved group) [Table I].

The majority of medical staff did not report any changes to their practice of hand washing after sneezing (62.8%) or coughing (69.4%). This occurred in both SARS-involved and non-SARS-involved group. However, with regards to hand washing after touching patients, the majority (58.5%) of staff in SARS-involved group reported an increase in this practice while the majority (50%) in non-SARS-involved group reported that their practice remained unchanged. This difference between the two groups was not statistically significant. With regards to the practice of wearing mask, gloves and apron when meeting with potentially infectious patients, the majority of staff in SARS-involved group (56.1%, 65.9% and 51.2% respectively) did so more often now than before compared to those in non-SARS-involved patients where in majority of staff (42.5%, 50% and 57.2% respectively), the practice remained unaffected. The differences in both groups were statistically significant [Table II].

With regards to hospital infection control matters, the majority in both groups (68.3% and 56.3%) reported that they were aware of changes occurring in hospital policies after the SARS crisis. However more staff in SARS-involved group correctly named the exact hospital ward dedicated for isolation of infectious

patients than those in non-SARS-involved group (53.7 vs. 32.5%). There was still a large proportion of staff in both SARS-involved (43.9%) and non-SARS-involved groups (62.5%) that did not know which were the hospital isolation ward. The difference however was not statistically significant. Over 90% of staff in both groups was aware of the procedure of notifying patients with infectious disease, but compared with non-SARS-involved group, a significant greater proportion in SARS-involved group claimed awareness of whom to notify in the hospital of an infectious patient in their wards (92.7 vs. 76.3%). Also, compared to non-SARS-involved group, a significantly greater proportion in SARS-involved group could correctly name the Infectious Disease Control Nurse (56.1 vs. 30%) and the Infection Control Committee Chairman (29.3 vs. 8.8%) of the hospital. Interestingly, a large proportion of staff in both SARS-involved and non-SARS-involved groups claimed ignorance of the hospital Infectious Control Nurse (43.9 and 65% respectively) and Infection Control Committee Chairman (36.6 and 80% respectively) [Table III].

Discussion

We have shown that in the aftermath of SARS crisis in Malaysia, there had been some positive impact in the individual practices and awareness level of medical staff in our hospital in relation to infection control. Compared with those who were not, medical staff who were directly involved with the care of patients suspected of SARS were more affected. This was reflected in the reported increase in their practice of washing hands, wearing masks, gloves and aprons when dealing with infectious patients and awareness on details relating to hospital infection control such as names of Infection Control Nurse and Chairman.

However there were also many from both group whose practice and awareness level remains unchanged. This indicates that SARS crisis had not significantly affected them or their practices. For example, over half (56.2%) of all medical staff could not correctly name the exact hospital dedicated isolation ward, and overall, nearly half (44.6%) maintained the same degree of frequency in the wearing of gloves when encountering potentially infectious patients.

Our study adopted the method of personal interview by the investigators in order to limit inaccuracies in findings brought about by misunderstanding of questions, lack of thoughtfulness in answering, or linguistic problems faced by staff from different ethnic and cultural backgrounds. An important interpretative consideration when dealing with answers provided in ordinal fashion such as 'more often', 'the same' or 'less often' is that those who answered 'the same' might do so because they had already maintained a high degree of hand washing etc, prior to SARS crisis. As such, answering 'the same' should not be interpreted negatively. However we believe that this is more likely an exception than rule, and should not bias the findings. Finally, the validity of our findings depends on the reliability of recall and individual perception by the staff interviewed. We did not conduct any similar studies prior to SARS crisis that could allow objective comparison with the aftermath. As such, human factor in recalling might be flawed and individual perception could be biased, making an accurate assessment of true changes in practices and awareness before and after SARS crisis not possible. Apart from staff recall and perception, the more reliable measurements would have been by direct observation by researchers.

Although not surprising, our findings that there were some significant positive changes in infection control practices and awareness especially in SARS-involved

Table I: Categories of medical staff interviewed

	Direct involvement*	No direct involvement*	Total
Doctors	15	30	45
Consultant/specialist	6	1	7
Medical officers	9	18	27
House officers	0	11	11
Staff nurses	16	30	46
Medical assistants	10	20	30

* with suspected SARS patients in one way or other as part of hospital infection control

Table II: Change in infection control practices as reported by medical staff who had and had no direct involvement with suspected SARS patients

	Total	Direct involvement*		p
		Yes	No	
Hand washing after sneezing				
More often	22.3	29.3	18.8	-
The same	62.8	56.1	66.3	-
Less often	14.9	14.6	15.0	0.408
Hand washing after coughing				
More often	16.5	22.0	13.8	-
The same	69.4	63.4	72.5	-
Less often	14.0	14.6	13.8	0.487
Hand washing after touching patients				
More often	45.5	58.5	38.8	-
The same	44.6	34.1	50.0	-
Less often	9.9	7.3	11.3	0.117
Wear mask when meeting potentially infectious patients				
More often	39.7	56.1	31.3	-
The same	41.3	39.0	42.5	-
Less often	19.0	4.9	26.3	0.004
Wear glove when meeting potentially infectious patients				
More often	47.1	65.9	37.5	-
The same	44.6	34.1	50.0	-
Less often	8.3	0.0	12.5	0.004
Wear apron when meeting potentially infectious patients				
More often	32.2	51.2	22.5	-
The same	53.7	46.3	57.5	-
Less often	14.0	2.4	20.0	0.001

Values are percentages unless otherwise stated.
* with suspected SARS patients in one way or other as part of hospital infection control

Table III: Awareness of hospital infection control matters in medical staff who had and had no direct involvement with suspected SARS patients

	Total	Direct involvement*		p
		Yes	No	
Aware of changes in hospital policy after SARS				
Yes	60.3	68.3	56.3	-
No	39.7	31.7	43.8	0.200
Knowledge of exact hospital ward dedicated for isolation of infectious patients				
Correct answer	39.7	53.7	32.5	-
Wrong answer	4.1	2.4	5.0	-
Don't know	56.2	43.9	62.5	0.076
Aware of the procedures of notifying infectious disease				
Yes	93.4	95.1	92.5	-
No	6.6	4.9	7.5	0.583
Aware of who to notify in the hospital of an infectious patient in your ward				
Yes	81.8	92.7	76.3	-
No	18.2	7.3	23.8	0.027
Knowledge of who the Infectious Disease Control Nurse of the hospital is				
Correct answers	38.3	56.1	30.0	-
Wrong answers	3.3	0	5.0	-
Don't know	57.9	43.9	65.0	0.012
Knowledge of who the Infection Control Committee Chairman of the hospital is				
Correct answers	15.7	29.3	8.8	-
Wrong answers	19.0	34.1	11.3	-
Don't know	65.3	36.6	80.0	<0.001

Values are percentages unless otherwise stated.
* with suspected SARS patients in one way or other as part of hospital infection control

staff, is valuable. It implies that SARS had impacted on individual and hospital infection control practices, albeit still an early aftermath. The SARS crisis illustrated to the world of how imperative it was to have stringent public health surveillance and hospital infection control policies in place. The solemn fact that one fifth of SARS victims were hospital healthcare workers attested to the reality of what could happen when infection control in hospital become lax[6]. It was estimated that a single infectious case of SARS would infect about three secondary cases in a population that does not institute control measures[7]. Furthermore, the psychological and occupational impact of severe hospital infection outbreak such as SARS can be devastating[8]. It is thus of no surprise that continual vigilance and augmentation in public health surveillance and hospital infection control is currently an important emphasis by WHO for all countries and regions[2,3]. The ease of international travel and economic globalization had like never before, provided ways for new and old diseases to move from one place to the other and perhaps, encouraged the crossing of species barriers in some infections[9]. There remains a need for quality assurance studies and medical audits on hospital infection control policies and individual practices in Malaysia and elsewhere in order to address any deficiency and maintain a high level of efficiency.

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