Reflection on SARS precautions in a severe intellectual disabilities hospital in Hong Kong

S.Y. Wong,¹ W.W. C. Lim,² T. L. Que,³ & D. M.Y. Au⁴

¹ *Mental Handicap, Siu Lam Hospital, Tuen Mun, Hong Kong*

² *Mental Handicap Infirmary, NTWC, Hospital Authority, Siu Lam Hospital, Tuen Mun, Hong Kong*

³ *NTWC, Hospital Authority, Hong Kong Tuen Mun Hospital, Tuen Mun, NT, Hong Kong*

⁴ *Occupational Department, Siu Lam Hospital, Tuen Mun, Hong Kong*

Abstract

Background Hong Kong went through a battle with a new respiratory disease, severe acute respiratory syndrome (SARS), from March to June 2003. All clinical settings, including rehabilitative and infirmary setting, have actively involved in fighting against the infection. The intent of this paper was to reflect on the SARS precautionary measures that had been taken in a severe intellectual disabilities hospital in Hong Kong.

Methods A review on six SARS precautionary measures were conducted. They were assessment of risk, formulation of operational guidelines, implementation of infection control measures, education and training of staff, conducting audits and carrying out environmental improvement work.

Results Patients were at risk of getting infected from carers, visitors, volunteers, and staff and patients of general hospitals. A SARS Quarantine Unit, isolation ward, was opened to isolate patients who might have had close contact with SARS patients during a stay in a general hospital or when they returned from home leave. Undoubtedly, both staff and relatives participated in preventing the patients from being

infected. No day leave and home leave was reported and the number of hospitalization in general hospital was decreased during the critical period. Three infection control audits were conducted and improvement work was carried out subsequently.

Conclusion The practice of grouping within a standard isolation room is recommended to continue in the future. Moreover, intensive infection control training for all staff is of highest importance to safeguard the health of both staff and patient.

Keywords residential and infirmary setting, SARS precautions, severe intellectual disabilities

Introduction

Severe acute respiratory syndrome (SARS) was first known to humans in November 2002 in mainland China. In Hong Kong, the first index case was made known on 22 February 2003. SARS is caused by coronavirus (Peiris *et al.* 2003) and can result in significant morbidity and mortality (Lee *et al.* 2003). It is characterized by having radiographic evidence of infiltrates consistent with pneumonia, fever $>38^{\circ}\text{C}$ or history of it in the past 2 days, history of chills in the past 2 days. A cough (new or increased), breathing difficulties, general malaise or myalgia, and a known history of exposure to the disease are also relevant to the diagnosis (HA Guideline on Severe Acute Respi-

Correspondence: Siu Yung Wong, Siu Lam Hospital, 16 $\frac{1}{2}$ Milestone, Castle Peak Road, Tuen Mun, Hong Kong
(e-mail: sywong@hkabc.net).

ratory Syndrome 2003). The main modes of transmission are by droplets and direct contact with patient's secretion, excreta and fomites.

SARS has spread and resulted in disease outbreak in various areas such as mainland China, Vietnam, Singapore, Canada, Taiwan and Hong Kong. It has created international anxiety because of its novelty, communicability and mortality (Wenzel & Edmond 2003). Despite a dedicated effort to control this epidemic, it has caused more than 1700 community members to become infected and has resulted in 299 deaths in Hong Kong. Amongst the infected, nearly 400 were health care workers. Eight health care workers died in this epidemic, including four doctors and two nurses.

The disease is new to humankind and there is no available treatment regime of proven efficacy, thus the most effective weapons may be individual protection by means of masks, goggles, gloves (Vu 2003), gown and stringent infection control programme. All clinical settings, including infirmary and rehabilitation setting for adults with severe intellectual disability (ID), have strived to prevent its occurrence by implementing pertinent precautionary strategies. The objective of this paper is to reflect on the SARS precautionary measures that had been taken in a severe ID hospital in Hong Kong.

ID refers to a person who has subaverage intelligence and intellectual functioning (Louhiala 2004). People who have severe ID are in the IQ range between 20 and 40 (Hong Kong Rehabilitation Plan 1999). Siu Lam Hospital is the only hospital that provides infirmary and rehabilitative care exclusively to adults with severe and profound ID in Hong Kong. It is a 350-bed government hospital under the management of the Hospital Authority (HA) of Hong Kong. Many of the patients also suffer from mental illness, epilepsy, cerebral palsy, Down's syndrome and autism. All of them need the support of their carers to meet their physical, social and health needs.

Methods

SARS precautionary measures that were employed in a severe ID hospital, Siu Lam Hospital, were reviewed, which included risk assessment, formulation of operational guidelines, implementation of

infection control measures, education and training of staff, conducting audits and carrying out environmental improvement work. Effective control involves the formulation of strict infection control policies, surveillance and training programmes (Mercier 1997).

Risk assessment

Initially, the hospital assessed the risk of contracting SARS in all clinical area. Hospital needed to categorize its clinical settings by risk, and implementing corresponding levels of infection control precautionary measures (HA Guidelines on Severe Acute Respiratory Syndrome 2003).

Formulation of operational guideline

The second strategy that the hospital employed was formulation of operational guidelines with regards to the HA information on SARS, which included HA guidelines on SARS, infection control measures in the homes for SARS contacts, infection control measures in their own homes for staff working in SARS wards, home isolation for staff and household members, proper use of personal protection equipment (PPE), cleansing and disinfection procedures, HA guideline on cleansing and disinfection of lavatories, handwashing guidelines, health advice on the prevention of respiratory tract infection and fact sheet on management of severe influenza infections.

Implementation of infection control measures

Droplet and contact precautions as the basic preventive measures were implemented in the hospital. 'Universal use of mask' was practised since 24 April 2003. In staff canteen, all chairs were repositioned on one side of each table leaving the opposite side free to prevent cross-infection among hospital staff during meal times. To prevent patients picking up infection from carers, visitors and patients of general hospitals, to which they might be transferred temporarily for medical problem, outside hospital activities like outings and activities that involved volunteers and relatives were suspended since March. Relatives were advised to suspend taking the patients out for home leave temporarily. An isolation ward – SARS Quar-

antine Unit, was established to accommodate patients who had close contact with SARS patients or returned from a general hospital or from home leave on 29 April 2003. The ward area was divided into clean, warm and hot zones. Clean zone was the area that patients would not enter while the warm zone was the area that patient might occasionally visited. The area that patient would frequently access was the hot zone such as the dormitory. To operate the unit, a work force was formed and staff were deployed from other wards and unit to deliver 24-h care there. Non-urgent services such as social education training sessions were suspended in order to maintain sufficient staff strength in the hospital.

PPE standard in different clinical settings was implemented on 17 April 2003. N95/surgical mask, goggles, full face shield, disposable cap, disposable gown, linen jacket and trousers and latex gloves were necessary for staff working in the isolation ward. For staff working in low risk areas, surgical mask was mandatory. However, they were required to wear additional PPE such as disposable cap, N95 masks, goggles, full face shield, latex gloves, linen gown and disposable gown for care procedures that would have a risk of exposure to patient's blood, secretions, body fluid or excreta.

Staff education and training

Continuous infection control training was provided to all staff either in the hospital or in other hospitals or in university setting to enhance their knowledge and skill. VCD training, to further enhance infection control concepts in day-to-day practice, was organized after classroom sessions in the hospital. Content of training included understanding of SARS, its diagnosis and modes of transmission, infection control precautions, isolation precautions, PPE standards and their use.

Audits

Audits and inspection round were conducted to ensure the staff compliance with infection control activities. It also aimed to give psychological and practical support to the front line staff. Audit on droplet precaution was conducted at the beginning of April. The second audit that focused on the implementation of droplet precaution and environmental

layout was conducted in midst of April. Audit on SARS precautions was conducted in the isolation ward and in one low risk ward in May.

Environmental improvement

Environmental improvement work was also carried out. Construction work on the water pipes of all common staff lavatories was carried out in April. Dispensers for paper towel and hibiscrub were installed in all wards in May. Extra resources were supplied to wards and units to meet with the infection control standard, for example cleansing cloth, paper towel and alcohol spray bottles. Mobile HEPA air filtration machines were also supplied to the isolation ward in May.

Results

The fundamental strategy the hospital has employed is to disrupt the chain of disease transmission. Eventually, zero infection was achieved throughout the battle.

Patients of the hospital are static; both the admission and discharge rates are low. They would not come into close contact with the community unless being accompanied. For them, the most likely way of contracting the infection would be from their carers, visitors, volunteers, and staff and patients of general hospitals during external hospitalization. Therefore those patients who had close contact with SARS patients and those re-admitted from general wards or returning from home leave were classified as the high risk group. They would be quarantine for 10 days in the SARS Quarantine Unit for SARS-like signs and symptoms. Patients with no outside ward activities were classified as the low risk group.

Four operational guidelines were formulated. They were infection control procedural guideline on SARS, contingency plan for the management of SARS, visiting policy and fever surveillance. The infection control procedural guideline on SARS specified 10-day precautionary measures for staff who had close contact with SARS and confirmed to have SARS. Patient dietary arrangement if staff working in hospital kitchen contracted SARS was specified in the contingency plan. Concerning visiting policy, no visitors was allowed in the isolation ward. For the low risk

area, visiting hours were limited to 2 h (9 am–11 am) per day, there was only one visitor allowed for each visit. All visitors were required to declare their health and check body temperature before entering the hospital compound. Formal visitor record was maintained. Visitors would be advised to leave and seek medical consultation if fever was detected. Moreover, they were required to wear a surgical mask during visiting and had to change a new mask after visiting. Visitors were also required to wash or swab their hands before and after visiting and whenever contamination was suspected, and to avoid sharing eating utensils with patients.

Co-operation had been gained from the relatives to minimize taking the patients home or out for community activities since 24 March 2003. The number of home leave and day leave were decreased during the critical period. The number of home leave reported from 1 March 2003 to 23 March 2003 was five. Zero home leave was reported for the period from 24 March 2003 to 7 July 2003. Upon the standing down of infection control precautions, five home leave were reported from 8 July 2003 to 31 July 2003. Concerning day leave, two day leave were reported from 1 March 2003 to 23 March 2003. For the period from 24 March 2003 to 7 July 2003, no day leave was reported. The number of day leave reported was increased from zero to four for the period from 8 July 2003 to 31 July 2003.

The physical health of the patients was closely monitored and external hospitalization were decreased. There were eight external hospitalizations reported from 1 March 2003 to 23 March 2003. Hence, there were only two and five external hospitalizations reported for the period from 24 March 2003 to 31 March 2003 and from 1 April 2003 to 30 April 2003 respectively. Four were reported for the periods of 1 May 2003–31 May 2003 and 1 June 2003–30 June 2003. There was only one reported from 1 July 2003 to 7 July 2003. However, for the period from 8 July 2003 to 31 July 2003, the number of hospitalization increased to 11. Moreover, admission of cases from the community was also minimized. There was one new admission for the period from 1 March 2003 to 23 March 2003 and zero from 24 March 2003 to 7 July 2003. One new admission was reported from 8 July 2003 to 31 July 2003.

Staff were also required to check body temperature before entering the overnight dormitory. If signs of

fever were revealed, it was mandatory for them to seek medical consultation. For staff training, the first series of infection control training was completed in early April. Refresher courses were organized in June. Eventually, nine-nine per cent staff attended more than 1 h training session.

Three infection control audits were conducted. The first audit revealed that staff had satisfactory-to-good compliance with droplet precaution. Inadequate handwashing between procedures were observed occasionally. Some supporting staff were confused about the strengths of disinfectant. On the spot coaching was then given by the auditors. The second audit revealed that infection control facilities were inadequate in some departments, and improvement work was carried out ultimately. The third audit was conducted in the isolation ward and one low risk ward. One hundred per cent staff of the isolation ward and 83% staff of the low risk ward reflected that periodical discussions on infection issues were held in the workplace, but at irregular intervals. One hundred per cent staff in the isolation ward reported that they found the information useful. For the low risk area, nurses found the information useful while the supporting staff found it fairly useful. Nevertheless, staff of both wards were able to identify satisfactorily those high risk procedures to which they would be exposed. It was still noticed that handwashing before and after each care procedure was occasionally inadequate. However, it was observed that staff of both wards had satisfactory performance on environmental cleansing especially in the disinfection of lavatories.

Discussion

All staff made every effort to shield patients from infection from visitors, carers, or patients of general hospital during the battle. Infection control is a concern that staff has been facing in delivering care to patients with ID (Lakhani & Bates 1999). Actually they were in a state of anxiety. In one way they were afraid of being infected. In the other way, they scared about any outbreak that would be occurred in the hospital that would pose a great challenge for them to manage the situation. Individuals with severe ID are at a higher risk of becoming infected with various communicable diseases than the general population

as many of them have difficulties in following commands or achieving independent living skills. Few of them are able to fit or wear a surgical mask properly. If an infection establish a foothold in a hospital, cross-infection will probably occur.

In view of the scarce supply of PPE in the early stage of the outbreak in Hong Kong, staff were willing to save up resources for other acute hospitals. Staff working in the isolation ward expressed a higher level of stress than those working in other clinical units. They were not only worried that they would be infected; they also worried about cross-infection that might be happened to their family members. Thus they concerned very much about knowledge and skill on isolation precautions such as gown up and de-gown procedures. Therefore they regarded infection control training highly essential. Nevertheless, with dedication, they still continued working in the isolation ward throughout the battle. Staff working in low risk areas concerned more about room ventilation. Some of them expressed a feeling of inadequacy in fighting against SARS. It was assured if they could successfully protect all the patients from being infected; they had already contributed to the prevention and control of SARS in Hong Kong.

It was not only the staff scared about being infected, relatives and visitors worried about cross-infection as well. To lessen their anxiety, information on SARS infection control precautionary measures was dispatched to them periodically. Majority of them showed acceptance attitude towards the hospital infection control strategies such as the visiting policy though they found the new visiting hours not convenience. However, repeated supervision was necessary to ensure their compliance with hand hygiene and use of mask.

It is recognized that there is dilemma between life quality and risk of infection. Community orientation activity like returning home and outings are very significant in enhancing their contact with the society and lacking of social contact is a common concern of individuals with severe ID living in institutions. It is no doubt that decreasing contact with the family or community will affect their quality of life. Yet, the risk of contracting an infection would be increased if there is an outbreak of infection occurred in the community. Taking into consideration of the risk and benefits they will be facing, reducing their contact with society temporarily to minimize the immediate physical risk

associated with outbreak of epidemic like SARS would be the opt alternative for them. Fortunately, relatives accepted the alternative and minimized taking the patients home or out for community activities temporarily. They even decrease the frequency of visiting the patients during the critical period. To alleviate their anxiety, they were encouraged to inquire patients' condition periodically by phone. In fact they were eager to receive the standing down messages from the hospital. By that time, they could take the patients home and out for community activities again.

Looking ahead

It is considered possible that the SARS coronavirus could strike again. Taking appropriate isolation precautions for known cases (Drazen 2003) and suspected cases (Tsang *et al.* 2003) is still considered to be the most effective measure to control the virus and to prevent the occurrence of an outbreak in hospital or community. As the virus can be effectively contained by quarantine alone (Holmes 2003), the practice of grouping within an isolation room should be continuously implemented in the hospital. A standard isolation room should be constructed as the environmental layout of the isolation ward was found inadequate. Actually the isolation ward was converted from an ordinary ward and extra facilities such as hand washing, shower and exhaust fans had to be installed to meet with the infection control standard.

Staff working in the isolation ward placed great value on information on isolation precautions. It was also revealed that staff still failed to wash their hands between procedures and patients occasionally. It is no doubt that intensive infection control training for all staff should be conducted continuously to upkeep their knowledge and skill at a high level. Curriculum and duration of training should be varied for different ranks of staff, and should be continuously updated when new information about the virus becomes available.

As staff found the HA daily bulletin 'SARS battling update' and regular infection control discussion useful in their workplace, it is recommended to continue this channel of communication in clinical settings in future. Moreover, infection control audits should be conducted periodically to review and feed back infection control issues to staff. All guidelines should be

audited regularly (Mercier 1997). The quality of PPE should also be improved.

Conclusion

After a long battle, it seems that SARS has been beaten but it could reappear without warning at any time. On 8 September 2003, Dr Lee Jong-wook, director-general of WHO, speaking in his keynote address at the 54th session of the World Health Organization regional committee for the Western Pacific in Manila, said 'We have to prepare on the assumption that this (SARS) will come back' and warned against complacency. On the same day in Singapore, a Singaporean man had tested positive for SARS in the first new case of the disease in 4 months. Other than SARS, the threat of new infectious disease is never ending. There should be a proven effective infection control system in place to cope with any sudden onset of infectious disease especially in institutions for patients with ID. Putting into practice all infection control precautionary measures is the responsibility of the health care workers themselves. A good infection control system should include comprehensive operational infection control procedures, human resources deployment plan, infection control standards and audits, staff education and training and material resources. All health care workers should work according to the standards as laid down. Moreover, the system should be reviewed and updated regularly. A battle might have been won, but the war is far from over.

The SARS outbreaks 'exposed many weaknesses in our health systems. If we are to avoid a similar crisis the next time, we have to greatly improve surveillance and preparedness against emerging and re-emerging diseases. Hospitals are in danger of becoming centres of contagion during an outbreak, and should strengthen infection control' (Shigeru Omi, director-general, Western Pacific Region, World Health Organization).

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