

SARS – a perspective from a school of nursing in Hong Kong

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Background. Severe acute respiratory syndrome (SARS) is a new infectious disease with significant morbidity and mortality that has had a major impact on health and health care services worldwide. Hong Kong has had a significant number of cases and deaths. Nurses, at the vanguard of the clinical health care team, have been particularly affected by it. The outbreak prompted the health authorities to implement a series of public health measures and hospital policies, including a guideline for the diagnosis and management of patients with SARS.

Aims and objectives. This paper aims at providing an overview of what is known about SARS and the impact it has had in Hong Kong and to highlight from the perspective of a school of nursing the major clinical, educational and public health implications.

Conclusions. The lack of understanding and uncertainty about the disease led to significant variation in the provision of information, contributing to the confusion and anxiety in the community. Therefore, there is a need to revise the nursing curriculum, to provide continuing education to all health care professionals, particularly with regard to infection control measures, and to revisit the range of public health policies to ensure the health of the community is protected by these policies. There also has been a reaffirmation of the importance of health promotion that highlights the importance of the partnership between nurses, health policy makers and public health personnel. It is evident that the organization and delivery of clinical practice, teaching and health promotion have to be flexible and responsive to a changing health scenario.

Relevance to clinical practice. Nurses must play a crucial role in the prevention, detection and containment of SARS. They will need to implement and ensure strict adherence to infection control measures and, in some circumstances, isolation and quarantine may be warranted. Attention to the psychological state of patients and family members should not be overlooked. Paramount is education of patients, families and members of the public at large.

Key words: clinical practice, health promotion, Hong Kong, infection control, nursing education, SARS

Introduction

The recent outbreak of a new infectious disease, severe acute respiratory syndrome (SARS), has had a major impact on the health and health care services of the people of Hong Kong. Nurses, at the vanguard of the clinical health care team, have been particularly affected by it. This paper aims to provide an overview of what is known about SARS and the impact it has had in Hong Kong, and to highlight the major clinical, educational and public health implications that it has.

SARS

SARS is a new infectious disease that is highly contagious with significant morbidity and mortality. It is a form of atypical pneumonia characterized by a high fever ($>38^{\circ}\text{C}$), dry cough, breathing difficulties and rapid deterioration. The disease is transmitted by droplet and direct contact. Thus, the high potential for transmission to close contacts, including health workers, puts nurses especially at risk.

The cause of SARS is believed to be a novel coronavirus that has not been previously identified in human being or animals (Peiris *et al.*, 2003). Research is ongoing to try to establish how long the virus can survive outside the body, in what concentrations it appears in various body fluids, and at what point patients are the most infectious.

The earliest known cases were identified in mid-November 2002 in Guangdong Province in China when there was an outbreak of atypical pneumonia. It was not until February 2003, however, that the World Health Organization (WHO) had received reports from the Chinese Ministry of Health of an outbreak of SARS with 300 cases and five deaths in southern China. As the SARS virus continued to spread, China admitted that it grossly under-reported the number of cases. China's lack of openness was unfortunate but not unexpected and was only partly healed by swift action by the dismissal of the minister of health and the mayor of Beijing.

In March 2003, the WHO issued a global alert on SARS. Indeed, the WHO director-general acknowledged that SARS could be viewed as the first global epidemic of the 21st century. In March, the Centers for Disease Control and Prevention (CDC) offered assistance to the WHO.

Impact of SARS in Hong Kong

According to WHO figures on 11 July 2003 there were 8437 probable cases, with deaths in 26 countries. Globally, over 813 lives have been claimed, the majority in China. Hong Kong, a special administrative region, has had more cases and deaths than anywhere in the world. The first index case in Hong Kong was admitted in late February (Chan-Yeung & Yu, 2003) and he infected relatives and guests staying in the same hotel as he was living. One of these hotel guests was admitted to a major hospital and was responsible for an outbreak there affecting 385 health care workers and students. As of the 11 July 2003, 1755 cases had been identified in Hong Kong, with 298 deaths (including eight health care workers). The outbreak prompted the health authorities to implement a series of public health measures and hospital policies, including a guideline for the diagnosis and management of patients with SARS (Ho, 2003).

A suspect case of SARS has been defined by the WHO as a person with respiratory disease of unknown aetiology, fever and cough or shortness of breath and exposure history (recent travel to an area with SARS transmission, or close contact with a suspected SARS case). A probable case of SARS is a suspect case with chest X-ray or autopsy findings consistent with respiratory infection. Although there remains some debate in the calculation of the fatality rate it appears to be about 10%. According to clinical observations, older and frail patients or those with major illnesses are more vulnerable. The importance of early diagnosis has also been identified as influencing the mortality.

Clinical implications

The SARS outbreak not only affected the health and well-being of the community-at-large but also health care workers, in particular nurses. The outbreak caught them without warning until a large number reported that they were ill. In Hong Kong, the problem of increased contamination among health care workers, patients and the public arose before a definitive diagnosis was made and before precautions were enforced based on that diagnosis.

The high infectivity of the coronavirus resulted in strict infection control measures and nurses revisiting their own infection control protocol in line with the CDC recommendations for isolation precautions in hospitals (see <http://>

www.cdc.gov/ncidod/hip/ISOLAT/isopart2.htm), particularly those recommendations pertaining to droplet transmission. In addition, given that the mode of transmission of the SARS virus is by droplet, it is important to take appropriate isolation precautions with patients suspected with SARS, with guidance from the CDC and the WHO (see <http://www.cdc.gov/ncidod.sars.ic.htm> and <http://www.who.int/csr/sars/ic.htm>, respectively). The general practice in hospitals was to use protective barrier (e.g. N-95 mask, goggles or face shields, gloves and protective apparel or gown). Wearing gloves, however, does not replace the need for hand washing. Frequent hand washing may be the one of the most important measures to reduce the risks of transmitting the SARS virus from one person or site to another. Because the main mode of transmission of the virus is by droplet, treatment with a nebulizer is avoided in patients with fever and chest X-ray infiltrates.

The rate of deterioration of patients with SARS was also alarmingly high with many requiring intensive care due to severe desaturation and worsening lung damage in spite of oxygen therapy. This resulted in patients requiring tracheal intubation and mechanical ventilation to correct the ventilation-perfusion mismatch. The large number of patients requiring intensive care also resulted in demands to double the number of intensive care unit (ICU) beds. Converting other clinical bed areas into ICU beds was an enormous task, requiring additional equipment and human resources. The already limited number of ICU-trained nurses meant that nurses from general wards had been deployed to work in these high-technology units even without ICU training and experience. Nurses' deployment created more work for the ICU nurses who already had a heavy workload taking care of SARS victims and mentoring these nurses. However, the deployed nurses, although willing to help out, remained anxious about their competency to work in ICU.

Once patients with SARS were admitted to the hospital, strict isolation meant that relatives were not permitted to visit in order to prevent contracting the disease. This created frustration and isolation of patients from their loved ones. To overcome such problems a telephone link-up with patients and their families was established.

Patients and families were not the only ones affected by the isolation procedures. Health care workers themselves were advised to stay in the hospital staff quarters in order to prevent infecting their families and the community in which they lived. Many nurses had taken this option and had not seen their families since the SARS outbreak. Nurses reported feeling exhausted from working extra shifts and concern because of the apparent lack of progress in many of their patients. The atmosphere in the clinical area was often demoralizing to nurses as they saw colleagues, relatives and

friends amongst patients in their care. In order to support staff, hospitals established a counselling 'hot-line' and provided intensive training and preceptorship programmes for new nurses working in ICU. Health care providers were reminded of the risks of contracting the disease and, in particular, the importance of infection control. Indeed, all nursing and medical students have to complete successfully a mandatory 2-day course on infection control before they can work with patients.

Educational implications

The SARS outbreak also raised several issues for the education of the next generation of nurses in the territory. The immediate effect of this health care crisis was on clinical teaching and assessment. To minimize the chance of cross infection and to allow hospital staff to concentrate their efforts to deal with the crisis, clinical teaching at all hospitals was suspended from the beginning of the outbreak. While the impact of this suspension was seen across all years of the undergraduate programme, it was most profound on the final year graduating students who were unable to complete the clinical hours as required by the Nursing Council of Hong Kong.

Most students in the Nethersole School of Nursing, for example, required another 60 hours. The school negotiated with the council to waive this requirement in view of the exceptional circumstances in order that, in times of a major health care crisis, students could qualify and contribute as early as possible to the already over-stretched workforce. To achieve this, alternative means of updating and assessing students' clinical knowledge and skills were considered, and the school's laboratories were used to facilitate clinical practice and assessment. This illustrates the importance of the statutory body and educational institutions working together more closely.

Another issue that SARS highlighted is the need to revisit the curriculum. For example, it is clear that proper protection and observance of strict infection control measures are vital. Indeed, it is timely to revisit issues such as barrier nursing, infection control, universal precaution measures and public health. When and how these areas are to be taught are being reviewed. Very often, infection control and universal precaution measures are considered to be elementary topics that are covered early on in the curriculum. Current experience indicates that a pregraduation module to revisit these important topics is required.

The morale of front-line staff was challenged as they shouldered the increasing clinical load while colleagues had contracted the disease. The death of a nurse was a further blow to staff morale. Boosting morale and managing stress

are essential and the curriculum will be revisited to assess the extent to which these might be achieved. Students' morale was affected as many felt powerless as to how they could help in this difficult situation. Some students had volunteered to join a temporary scheme established by the hospital authority to relieve the pressure on nurses in clinical areas. Support to students from staff in terms of professional guidance and an opportunity for sharing views and experiences about this health care crisis was crucial.

Public health implications

SARS has also had an enormous impact on community and public health. The presentation of SARS in an acute setting perhaps masked the importance of public health in managing the disease. The early management focused on inpatients, with the implications for the wider community appearing a secondary issue. Once the significance of the disease to public health was acknowledged, the Hong Kong Department of Health immediately established a website (<http://www.info.gov.hk/dh>) and produced and circulated bilingual leaflets outlining strategies to prevent the spread of the disease. The Department of Health also implemented procedures such as contact tracing and quarantining of suspected contacts.

The lack of understanding and uncertainty about the disease led to significant variation in the provision of information, contributing to the confusion and anxiety in the community. This confusion and anxiety led to fear and panic in people in every sector of society. A proliferation of e-mails about the outcome of the disease circulating amongst health care workers and the general public exacerbated the situation. Information about whether to wear masks provides an illustration. The Department of Health continued to state that masks were only necessary for those people with respiratory infections or caring for sick people whereas other health professionals stated that masks should be worn by everyone at all times. Such messages contributed to uncertainty and created feelings of stigmatization amongst people choosing not to wear masks, mimicking some of the fear and stigma experienced when HIV first emerged as a disease.

A major impact of the disease, however, was a reaffirmation of the importance of health promotion to the health of the community. This reaffirmation has highlighted the importance of the partnership of health policy and health education in public health. Policy implications were highlighted in the cleansing of public areas and building regulations as well as at a more micro level to ensure that all schools provide soap for children after using the toilet. It perhaps also highlighted the complexity of providing healthy high density housing, particularly as there were far fewer cases of SARS in

particular areas of Hong Kong. Health education was identified as playing a significant role in containing the spread of the disease in the community. Health education strategies not only targeted all individuals, whether at home or work, in terms of personal hygiene, but also life style to ensure that people maximized their level of immunity; apparently essential to the prevention of SARS.

It is important also to acknowledge that there have also been some positive outcomes from the SARS outbreak for the community and public health. Firstly, it has highlighted the need to revisit the range of public policies affecting health to ensure the community is protected by these policies. Building regulations provide one such example. Secondly, it has highlighted the strength of community action in managing such health issues. At a macro level, activities such as Project Shield have allowed members of the community and the private sector to come together to provide protective clothing for health care workers. At a micro level, a range of strategies have been implemented to improve the health of a community. An example is the joint initiative, supported by a grant from local government, involving a women's cooperative and unemployed people that provides older people with correctly diluted bleach for home cleansing. The Nethersole School of Nursing has tried to play a part by working with local schools and community centres in health education and SARS prevention, teaching people how to wash their hands, wear gloves and masks, answering queries and responding to concerns. Finally, the SARS outbreak has put public health firmly back on the health care agenda.

Conclusion

Efforts have been focused on the detection, containment and prevention of the spread of SARS. Infection control policies have been implemented. Isolation and quarantine measures were implemented in some cases. The measures were usually voluntary but could be mandatory. Locally, measures included home quarantine and hospital and school closures. Internationally, measures included travel advice, health alert notices and the screening of airline passengers.

The SARS crisis points to the need for global systems and cooperation. Active efforts are underway to identify rapidly suspect cases, control potential secondary spread, facilitate discovery of the causative agent and understand disease transmission.

The human and economic consequences of SARS have been far-reaching. Of course, the health risks were paramount, but education was also badly hit. The epidemic took a serious toll on travel, tourism and finance in East Asia. The effects of SARS were so widespread that many economic analysts

believe it has been more damaging to East Asia's economies than the war in Iraq.

From a nursing perspective the consequences of SARS have also been far-reaching and highlight the need to constantly review clinical practice, education and public health measures.

Contributions

Idea/conception of article: DRT; manuscript preparation: DRT; literature review: DRT, VL, DL, ST.

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