

# POSITION STATEMENT SEVERE ACUTE RESPIRATORY SYNDROME (SARS) IN ELDERLY

Hong Kong Geriatrics Society

J HK Geriatr Soc 2004; 12:37-42

## Summary

In the era of SARS, there have been much concern about the atypical features of SARS in elders, and they have even been described as “invisible SARS.” The Hong Kong Geriatrics Society (HKGS) advocates **the need to approach elders in the era of SARS with appropriate attitude, knowledge and skills.**

The HKGS has formed a **Special Interest Groups (SIG) on “SARS in Elders”** in April 2003. The aim is to further research and understanding of this new illness, promote links with the HKGS and other medical specialist societies, and unmask the prevailing myths, misconceptions, and fears surrounding “SARS in Elders” and “invisible SARS.”

While fit elders can report the typical symptoms of SARS, just like their younger counterpart, this is often not the case for frail elders, who tend to present more typically as the **geriatric syndromes** (the so-called “atypical” presentations): falls, confusion, incontinence and poor feeding. Instead of a fever of over 38°C, a “**fever pattern**” may be observed.

A **diagnosis of SARS** in old age requires a high index of suspicion, knowledge of the geriatric presentations of infections in old age, sensitivity to a frail elder with change in physical and functional state, alertness to any contact history of SARS, and an updated knowledge of the current prevalence of SARS in the locality. It is equally important not to over-diagnose SARS in elders as not to under-diagnose SARS in elders.

Elders with SARS often have an apparently **lengthened incubation period** (14 days or more) because of delayed detection of onset and inexact day of contact due to multiple exposures. This has important clinical implications on diagnosis, contact tracing duration of surveillance and cohort, as well as infection control measures during high risk nursing and personal care for these frail elders. This long incubation period also calls for an adequate period of careful observation of hospitalized elders at risk of SARS, and when such patients are moved

to a different setting (e.g. acute hospital to rehabilitation hospital, or hospital to aged home), close communication between the staff about SARS contact is essential.

Elders are more vulnerable to the **adverse side effects of drugs** (up to 50%) commonly used to treat SARS. The benefit to risk ratio of any given intervention can be quite different in frail elders with significant co-morbidities when compared to younger adults or fit elders. So, an individualized approach is required in treating an elder with SARS. Since an acute illness in an elder often results in reduced functional ability, a rehabilitative approach is also important.

The **high mortality rates** (50-75%) reported in elders with SARS can be attributed to late presentation, delayed diagnosis, comorbid conditions, and complications from treatment. For frail moribund elders with SARS, attending to the **palliative needs** of the elder and his family can be challenging when there are barriers imposed by infection control.

**Prevention of SARS** depends on breaking the chain from exposure to infection, and thus both prevention of exposure and early detection of SARS in elders are important in minimizing spread. To control infection, it is equally important to protect patient as protecting staff. Attention should be paid to helping those elders with adverse social circumstances, to avoid inappropriate hospitalization, and to keep careful surveillance of recently discharged elders.

**Input from geriatricians** is important in combating SARS in elders, whether in acute, rehabilitation or community settings.

## Introduction

To arouse and promote interest on the topic of SARS in elders, the Hong Kong Geriatrics Society (HKGS) has formed a Special Interest Groups (SIG) on “SARS in Elders” in April 2003. We wish that the SIG would further research and professional

competence, serve as a resource to guide clinical practice, promote links with the HKGS and other medical specialist societies, unmask the prevailing myths, misconceptions, and fears surrounding “SARS in Elders” and “invisible SARS”, and ultimately help to improve the quality of care of elderly patients.

A press release was made on “SARS in Elders” by the HKGS on 25 April 2003 to express our concern and views<sup>1</sup>. An interhospital geriatric meeting on “SARS in Elders” was held on 30 May 2003, in which the clinical experiences and findings on “SARS in Elders” among geriatricians and a clinical microbiologist were shared and discussed<sup>2-8</sup>. The HKGS has the following position statement on SARS in elders:

### **The Negative Image of Elders in the Era of SARS**

The HKGS has grave concern about the negative image being portrayed on elders in this era of SARS: old folks as “litter bugs” with poor personal and household hygiene, elderly persons as “invisible” SARS spreading infections to health care workers. The HKGS wishes that this negative image would be dispelled with better understanding of geriatric medicine and gerontology. Poor personal and household hygiene can be due to disabling diseases (like stroke, arthritis, etc.) and inadequate social support network, which need to be dealt with in its own right. The “invisible” SARS in elderly persons can be due to missed or delayed diagnosis because of failure to recognize the special presentations of infections in old age. The HKGS advocates the need to approach elders in the era of SARS with appropriate attitude, knowledge and skills.

### **Diagnosis and Detection of SARS in Elders**

Although SARS is a clinically defined syndrome, the diagnosis of SARS in elders in clinical practice relies on the detection of compatible clinical features of SARS, a contact history, and supporting laboratory and radiological findings.

#### **1. Contact history**

Elderly people are heterogeneous, forming a continuum from fit elders to frail elders. For previously fit and ambulatory elder, the travel history, social network and household contacts are relevant. For frail elderly people with chronic illnesses, recent hospitalizations, care needs and care profile (e.g. need for tube feeding, continence care, visits by out-reach health care workers) are

relevant. For institutionalized elderly people (hospitalized patients or residents of aged homes), in addition to those mentioned for frail elderly people, recent occurrence of SARS in a nearby patient (e.g. Case 3<sup>4</sup>, Case 3<sup>7</sup>) or in a health care worker providing care to her should raise the suspicion. A local survey<sup>5</sup> of SARS among residents of aged homes showed that, of the 61 SARS cases up to 15 May 2003, 44 (72%) were hospital acquired and 10 (16%) were acquired in aged home. The same survey also revealed that an aged home resident is 3.6 times as likely as the general population in contracting SARS (0.1% vs. 0.028% in prevalence). Because the presentations of SARS in old age can be non-specific, a positive contact history may be the first important clue leading to a diagnosis of SARS in an elder with unexplained illness (e.g. Case 3<sup>4</sup>, Cases 1 & 3<sup>7</sup>).

#### **2. Clinical features**

While fit elders can report the typical symptoms of SARS (fever, chills or rigors, cough, myalgia, malaise, diarrhoea) just like their younger counterpart, this is often not the case for frail elders, who tend to present more typically as the geriatric syndromes (the so-called “atypical” presentations) and the picture may be further complicated by coexistence of multiple pathologies or diseases.

The strict SARS case definition and registry criteria require a body temperature of at least 38°C. However, some of the reported SARS cases in elders have body temperature below 38°C. A retrospective study of SARS<sup>7</sup> revealed that older patients (aged 61 or above) were less likely to have a fever over 38°C at presentation compared with younger patients (57% vs. 88.6%). In one study of SARS<sup>4</sup>, 24% (5 out of 16) of elderly patients did not report any symptom of fever prior to or on admission. Fever in an elder, though present, may not be detected if attention is not paid to proper temperature recording. Checking axilla temperature is convenient but can be inaccurate because of vasoconstriction and the inability of some frail skinny elders to keep the thermometer in the axilla. Oral temperature can also underestimate the body temperature because elders with pneumonia often have compensatory shortness of breath, and the rapid breathing cools down the thermometer. Rectal temperature or the more acceptable tympanic (ear) temperature is more accurate measure of the body temperature. Furthermore, because of the declining immune function due to ageing, disease, or drugs (e.g. NSAID given for arthritis), elders often have blunted fever

response to infections: there may be low-grade fever (less than 38°C), absent fever, or even hypothermia. Some elders may have a low basal body temperature to start with so that in the presence of infection, the body temperature may still kick up but to one less than 38°C. Thus, reliance should not be only on an absolute figure of 38°C, but also on observing any serial rise in body temperatures. This pattern of blunted rise in body temperature from a low baseline recording, but with an intact tachycardia response, has been illustrated in an elder taking naprosyn chronically for gouty arthritis<sup>8</sup>. The biphasic pattern of fever corresponding to the first 2 phases of SARS may mislead the clinician into thinking that a fever is responding initially to antibiotics during the early course of the undiagnosed SARS, only to discover the elderly SARS in the second phase when the fever kicks up again<sup>3</sup>.

In the presence of infection, frail elders tend to present as the geriatric syndromes: falls, confusion, incontinence and poor feeding. Focus on the management of injuries resulting from falls in an elder (fractures, head injuries) may distract the clinician from an underlying cause of fall, which can arise from medical illnesses, including SARS (e.g. Cases 2 & 3<sup>1</sup>). Confusion (e.g. Case 1<sup>3</sup>, Case 3<sup>7</sup>), a common presentation of infection in old age, not only render the affected elder unable to report her symptoms, but may divert a clinician's attention to investigate on brain disease or dementia, or such patients may just be restrained. While an elder may not complain of any cough in the presence of pneumonia, a rapid breathing rate may be a first sign of pneumonia in old age. A bed-bound elder may have a normal respiratory rate on lying down, but with the slightest exertion such as when asked to sit up, the respiratory rate may go up. SARS may not necessarily present as respiratory symptoms, but may also as gastrointestinal symptoms like diarrhoea, nausea or vomiting, which in a frail elder, may take on the picture of faecal incontinence (e.g. Case 4<sup>1</sup>) and poor feeding. Because of the non-specific nature of these geriatric presentations, it is important both to avoid under-diagnosis and over-diagnosis (e.g. Case 4<sup>7</sup>) of SARS. A retrospective study has shown that 2/3 (100 out of 105) of elderly patients (aged 65 or above) referred for suspected SARS has alternative diagnosis, compared with 1/3 in younger patients<sup>9</sup>.

Because of the frequent occurrence of multiple pathologies in old age, the diagnosis of SARS may be masked by alternative explanations of coexistence of other illnesses in old age<sup>3</sup>, Case 2<sup>4</sup>:

e.g. aspiration pneumonia in an elder with history of multiple old strokes or in an elder with brain secondaries, pneumoconiosis, COPD, pulmonary tuberculosis<sup>3</sup>. Similarly diarrhoea may be attributed to faecal incontinence in a highly dependent elder.

So, a diagnosis of SARS in old age requires a high index of suspicion, a knowledge of the geriatric presentations of infections in old age, a sensitivity to a frail elder with change in functional state and not fairing well after usual observation and treatment, and an alertness to any contact history of SARS or clustering of illnesses in her life-space zone (be it at home or in aged home), and an updated knowledge of the current prevalence of SARS in the locality. Ultimately, the probability of a correct diagnosis of SARS depends very much on the "pre-test" probability: the prevalence of SARS in the locality and a contact history (e.g. Case 1<sup>4</sup>).

### 3. Laboratory findings

Elucidation of the aetiological agent for SARS has led to microbiological tests for Coronavirus (CoV) to support the diagnosis of SARS. However, a positive RT-PCR for CoV from throat and stool specimens is found in only 70-80% of patients with SARS<sup>4</sup>, and the positivity depends on the timing of collection. A negative RT-PCR for CoV nevertheless cannot exclude a diagnosis of SARS. A 4-fold rise in serum antibody to CoV helps to confirm the diagnosis, but the rise often occurs only after 3 weeks of illness, and is therefore not helpful in early diagnosis and treatment. As different laboratories have different reference ranges for the antibody titre to CoV, the significance of the absolute value of a single serum viral titre has to be checked with the testing laboratory, but for clinical interpretation of CoV infection, a 4-fold rise in paired titre is more important<sup>6</sup>.

While a number of biochemical and haematological findings have been described in SARS, they cannot be relied on to diagnose SARS in elders, and can also be found in illnesses other than SARS in elders. Thus, lymphopenia can be an indicator of malnutrition, and is also found in other infection like tuberculosis (e.g. Case 4<sup>7</sup>), and may be drug-induced (e.g. clopidogrel<sup>3</sup>). A raised LDH can be secondary to other causes, e.g. myocardial infarction or megaloblastic anaemia. Hyponatraemia can be a result of diuretics, poor intake or SIADH due to lung diseases. Reliance on these non-specific haematological and biochemical findings may lead to overdiagnosis of SARS<sup>3</sup>.

#### 4. Radiological findings

While radiological evidence of new lung infiltrates is one of the criteria in the SARS definition, interpretations of chest X-rays in frail elders may be affected by the substandard quality of X-ray film taken because of their inability to maintain proper posture because of disabilities and skeletal deformities and contractures. Moreover, pre-existing background X-ray abnormalities due to chronic lung problem like old tuberculosis, chronic bronchitis, pneumoconiosis bronchiectasis may add on the difficulty in detecting recent change arising from acute infection like SARS<sup>3</sup>.

#### 5. The "long incubation period"

The incubation period of an infection, defined as the number of days between exposure and the onset of symptoms, is quoted as between 2 to 10 days for SARS. However, both the exposure and onset of symptoms are not clear cut in frail elders. Because of their dependence on close personal and nursing care, frail elders tend to have multiple exposures, and depending on whether the first or the last exposure is used in the calculation of incubation period may be over or under estimated<sup>8</sup>. Similarly because of the non-specific geriatric presentation and the lack of a fever response, the onset of detection by a clinician may be later than the onset of symptoms ("undetected"), so that the calculated apparent incubation period (using the onset of detection) appears longer than usual<sup>3-4</sup>. One study of an outbreak of SARS reported an apparently lengthened incubation period of 14 to 21 days<sup>3</sup>. In this cohort, 48% were believed to present at phase II of disease at the outset with the first phase of acute viraemia masked.

This "long incubation period" in frail elders with SARS has several clinical implications<sup>8</sup>. First, the length of an incubation period is characteristic of a particular infection, and is often used to support the diagnosis of that infection. Thus, a long incubation period, say of 14 days, should not lead one to doubt the diagnosis of SARS in a frail elder, and on the contrary, may be characteristic of SARS in frail elders. Second, in contact tracing a possible source of SARS for a frail elder should not be ignored simply because the exposure occurs more than 10 days (e.g. 14 days) from the onset of detection of SARS in a frail elder. Third, in an outbreak, elders with SARS contact may have to be kept under surveillance for a period longer than 10 days. Fourth, it has implications for infection control measures during high-risk nursing and personal

care for these frail elders. Finally, this long incubation period also calls for an adequate period of careful observation of hospitalized elders at risk of SARS, and when such patients are moved to a different setting (e.g. acute hospital to rehabilitation hospital, or hospital to aged home), close communication between the staff about SARS contact is essential, otherwise outbreaks may occur in the transferred hospital or aged home. Finally, infection of a health care worker after exposure to an elder with SARS before the onset of detection of SARS in that elder may lead to the apparent misinterpretation of "infection during incubation period."

#### Management of SARS in Elders

There have been much discussion among the professionals and the public on the treatment strategies of this relatively newly discovered SARS. While scientific evaluation of these treatment strategies are awaited, we would like to point out the challenges in managing SARS in old age. Adverse drug reactions in old age are common. Thus elders are more vulnerable to the adverse side effects of ribavirin and steroid commonly used to treat SARS. One study<sup>3</sup> has shown the following frequency of side-effects of treatment: reduced appetite (22.7%), drop in haemoglobin over 2g/dL (36.4%), impaired liver function (31.8%), impaired renal function (27.3%), confusion (13.6%), hyperglycaemia (31.8%), hypokalaemia (47.8%), and secondary bacterial infection (18.2%). Another study<sup>4</sup> reports nosocomial infection complicating treatment in 47% of cases. New drugs are often not well tested in elders and history is filled with lessons of serious adverse drug reactions when using new drugs in old age. The benefit to risk ratio of any given intervention may be quite different in frail elders with significant co-morbidities when compared to younger adults.

Elderly people are heterogeneous, forming a continuum from fit elders to frail elders. So, an individualized approach is required in treating an elder with SARS, balancing the risk benefit ratio and appropriate to her condition and course of illness. An acute illness in an elder often results in reduced functional ability, so that a rehabilitative approach is important in returning them to the community. For frail moribund elders with SARS, the palliative needs of the elder and his family should be attended to, and this can be challenging when there are barriers imposed by infection control.

The mortality rates of SARS in elders reported

in various local studies are 53% for patients aged over 61 (vs. 8% for those aged below 60<sup>7</sup>), 58.8% for patients aged 61-80<sup>4</sup>, 67-75% for patients aged over 65<sup>3</sup>, 75% for patients aged over 80<sup>3,4</sup>. The high mortality reported in elders with SARS can be attributed to late presentation, delayed detection and diagnosis, comorbid conditions, complications from treatment<sup>3,7</sup>.

### **Prevention of SARS in Elders**

Prevention of SARS depends on breaking the chain from exposure to infection, and thus both prevention of exposure and early detection of infection of SARS in elders are important to minimizing spread of SARS in elders.

#### *1. Attention to adverse social circumstances*

While promotion of public hygiene is high on the agenda as an important measure to prevent cross-infection, some elders may be affected by adverse social circumstances like living alone, inaccessible to mass media, inadequate social network and handicapped by disabilities. They need to be adequately helped by mobilization of social resources.

#### *2. Avoid inappropriate hospitalization*

Frail elders are prone to exposure to SARS because of their frequent need for hospital and medical service, and their need for close personal and nursing care by health care workers. As 72% of SARS cases in residents of aged homes are hospital acquired<sup>5</sup>, unnecessary and inappropriate hospitalizations should be avoided, and their medical needs met by community and out-reach care as far as possible.

#### *3. Infection control - Protecting both staff and patient*

Since SARS is transmitted by droplet spread, and of special relevance to hospitalized elders and residents of aged homes is that infection can be transmitted through contaminated respiratory and oropharyngeal secretions and faecal excreta. It is therefore important to promote on the awareness and compliance of health care workers and aged home staff in maintaining proper hygiene (esp. hand washing) and taking precautions in nursing procedures to prevent infection, such as changing feeding tubes, urinary catheter, and napkins, and in sputum suction. Nebulizers are best avoided and replaced by alternatives. Patients should also be adequately protected by observation of personal hygiene of both staff and patients, as well as early

detection of staff with symptoms of SARS and their removal from patient contact.

#### *4. Surveillance*

Since frail elderly residents of aged homes may have SARS under-diagnosed, contact tracing using the strict SARS definition have its limitations. Thus, we have to be alert to probability of SARS in elders recently discharged from hospitals, monitor for any change in physical and functional state of residents, alert to clustering of any illnesses in space and time for residents, staff, visitors and outreach workers of a particular aged home, and this may mean careful recording of all those who fall sick (who, when, where) and watch out for clustering and links. This will mean close collaboration and communication among visiting medical officers, out-reach community geriatricians, community nurses, and acute and rehabilitation hospital staff.

#### *5. Model of Hospital Services in the Prevention of SARS*

Since an elderly SARS may present with the geriatric syndromes, early detection of SARS can be enhanced by input from geriatricians for elderly patients presenting acutely with confusion, falls, incontinence, poor mobility, poor feeding, or with background of such chronic problems and for those residing in aged homes (indicating a degree of physical or mental frailty).

In order to minimize the risk of cross infection of SARS, it is important to reduce unnecessary inter-hospital transfer. Geriatricians can have a useful role in acute hospitals in facilitating direct discharge of elderly patients to the community with support from geriatric day hospital or community geriatric assessment service.

When patients need to be transferred from acute to extended care hospitals for rehabilitation, close communication between acute and extended care hospitals about SARS contact is essential. Geriatric wards are at risk of SARS contact whether in acute or extended care settings, and thus public hygiene and infection control measures should be strictly observed.

Residents of aged homes planned for discharge from hospitals back to aged homes should be assessed by geriatricians regarding risk of SARS, history of SARS contact, functional status, and suitability of return to her aged home, and any further follow-up surveillance communicated to out-reach community geriatric assessment service.

### **Impact of Undiagnosed SARS in Elders**

Undiagnosed SARS can result in outbreak among health care workers and patients within hospital and aged homes<sup>1, 3, 4</sup>, and this may lead to further outbreaks in community. An example of similar outbreak involving unrecognized tuberculosis in a nursing home in the United States has been revealed by molecular and epidemiological links<sup>10</sup>. We would do well to heed the advice of Sodhy in 1978 when he warned of the reemergence of tuberculosis in the older and the underprivileged after initial triumph in controlling its infectious spread, "Because of the transmissible nature of tuberculosis, no one is safe until all are safe; and until all are safe, the disease remains a blot on the conscience of the world community."

### **Role of Geriatricians**

Geriatricians can play their role in combating SARS whether in acute, rehabilitation or community settings, diagnosing SARS despite of atypical presentation and multiple pathologies in old age, avoiding iatrogenesis in the midst of therapeutic uncertainties, attending to individual variations and needs of an elderly person by adopting a holistic approach rather than just focusing on attacking the pathogen and correcting the pathogenesis, rehabilitating elders with functional consequences, providing palliative care for moribund frail elders, as well as adopting preventive measures in aged homes to minimize further spread within the community.

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