
Proceedings of Paediatric SARS

Paediatric SARS Seminar held on 20 April 2003 at the Hospital Authority, being organised by the Hong Kong College of Paediatricians and Princess Margaret Hospital (PMH)

1. The Princess Margaret Hospital Paediatric SARS Experience

MC CHIU

2. Clinical Features, Diagnosis, Treatment and Short-term Outcome of Severe Acute Respiratory Syndrome (SARS) in Children

CW LEUNG

3. Neonatal Aspect of SARS

CC SHEK

4. Infection Control and Staff Protection

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The Princess Margaret Hospital Paediatric SARS Experience

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From 29 March 2003, Princess Margaret Hospital (PMH) being designated as the only SARS hospital, had to admit all SARS patients of Hong Kong, and the Department of Paediatrics & Adolescent Medicine was responsible for managing all suspected SARS/SARS patients below 18 years of age. This lasted for 10 days, during which a total of 110 patients below 18 were admitted. Afterwards, PMH continued to manage such patients with other hospitals together.

Preparation of the Mission

Wards

It came with a very short notice. Within 48 hours we had to start admitting all SARS children and adolescents. On the one hand, more than a hundred patients, including NICU, SCBU, PICU and long term ventilator care patients had to be transferred to other hospitals or discharged, while on the other hand, we had to prepare wards to admit SARS patients.

At the beginning, it was not easy to estimate the number of beds required. But since the infection had spread to the community, there wasn't good reason to presume children would be exempted from being infected. From Census 2002, 19.9% of the total population are below 18 years of age. Thus, the number of beds required might constitute 20% of the total beds as an estimate.

In the initial phase, 5 wards of 108 beds were opened, one ward for PICU/NICU, one for SARS children below 8 years old, one for 8-17 years old SARS boys, one for 8-17 years old SARS girls, and one for suspected SARS patients. The guiding principles in the preparation were that these wards should abide to infection control recommendations in that they had to be spacious, and the bed number in each ward had to be kept to a minimum, and that there should be adequate staffing ratio especially in PICU. Staff safety was the number one concern in the whole exercise.

Staff

Doctors and nurses of the Department were called for in fighting the battle, and were trained in infection control in protecting themselves. Medical staff was divided into 2 teams, a SARS team and a non-SARS team taking care of general/renal/SOPD duties. The two teams were totally separated in duties including on-call. Such measure was to minimize the risk of cross infection. For the SARS team, there were altogether 16 medical officers led by 5 consultants and 6 senior medical officers; and for the non-SARS team, 8 medical officers were led by 1 consultant and 2 senior medical officers. It was fortunate that there a few volunteers joining the Department to strengthen our force to fight the battle.

The Exercise

Patients were admitted according to the guidelines drawn up for all accident & emergency departments, which were applicable for both adults and children (Figures 1 & 2).

From 29/3 to 16/4, there were altogether 745 admissions for the whole hospital, of which 133 were below 18 years old (17.9%). The ratio of Medical: Paediatric admissions was 4.6:1. Most admissions occurred in the first 10 days which cumulated to 123 at 12.3 per day (Figure 3). The % of admission according to age groups quite correlated with the % population at a slightly lower percentage (Table 1). Clinical SARS was diagnosed according to the criteria of fever, Chest X-ray of pneumonia/acute respiratory distress syndrome, close contact, failure to respond to antibiotics, and relevant symptoms (Table 2). Following those criteria, 43 patients were diagnosed as clinical SARS, with 74.4% of 10-17 years of age among the group below 18 (Table 3). The treatment regimen was also standardised using ribavirin, prednisolone and pulse methylprednisolone with a stepwise approach according to severity and clinical response. As no visiting policy had to be strictly adhered to, there were psychosocial issues for patients staying in hospital. Informing parents at fixed time each day helped communicate medical conditions to alleviate anxieties and worries of parents.

Results

Patients

Of the 43 clinical SARS patients, 5 required PICU care having 2 put on BiPAP and 1 intubated. By 19/4, there was

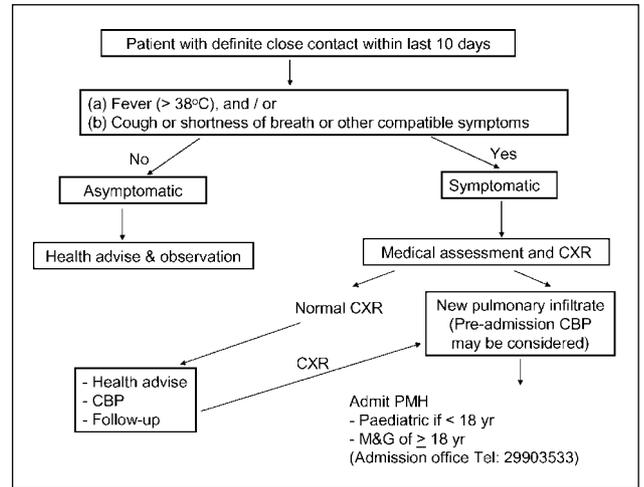


Figure 1 A&E management flowchart (for definite contact).

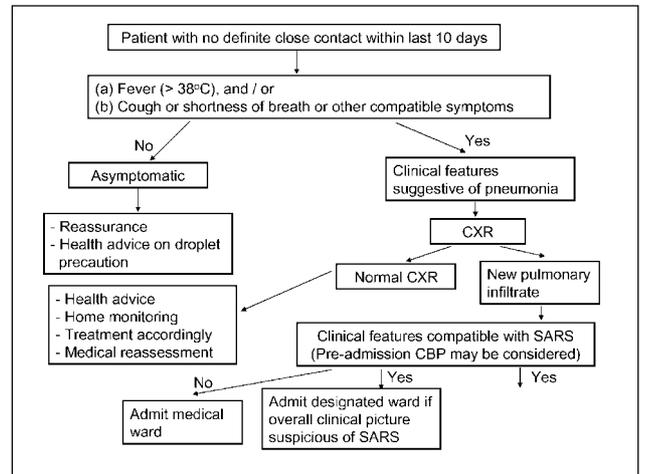


Figure 2 A&E management flowchart (for no definite contact).

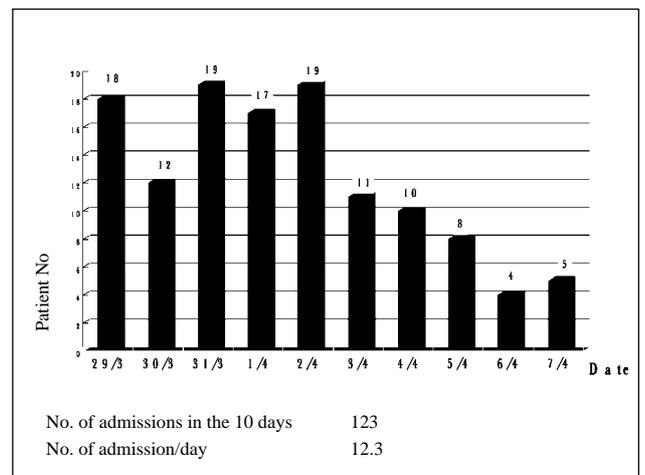


Figure 3 Paediatric admissions 29/3-7/4.

no mortality. In addition there were 3 babies born from SARS mothers. All were premature babies having Caesarean section deliveries at 28, 26, 32 weeks gestation, and requiring NICU care. Eighty-three patients had been discharged, including 13 SARS and 70 non-SARs by 19/4.

Table 1 Admission according to age groups

Age (yr)	No.	% admission	% population*
0-4*	33	4.4	4.0
5-9	39	5.2	5.8
10-14	39	5.2	6.4
15-17	22	3.0	3.8
Total	133	17.8	20.0

*3 premature babies born from SARS mothers

Table 2 Clinical SARS in children and adolescent

Age (yr)	SARS		Paed. admissions	
	No.	%	No.	%
0-4	3	7.0	33	24.8
5-9	8	18.6	39	29.3
10-14	19	44.2	39	29.3
15-17	13	30.2	22	16.6
Total	43	100	133	100

No. of clinical/confirmed SARS: 43

No. of babies born from SARS mothers: 3

Table 3 Results-patients outcome

Patients: (Till 19/4)	
No. of clinical SARS	43
No. of babies from SARS mothers	3
No. of patients requiring PICU care	6
requiring intubation	(1)
requiring BiPaP	(2)
No. of patients requiring NICU care	3
No. of death	0

Staff

There were no medical staff nor supporting staff infected, however 2 nurses came down with the disease. They probably had contracted the disease during at the start of the exercise when a large number of SARS patients were admitted. The infection rate was much lower compared than the adult counterpart especially with ICU. This might be related to fewer critical cases, lower infectivity in children and fewer patients we had compared with adults.

Follow on Actions

SARS patients need to be followed up for any sequelae, such as pulmonary function dysfunction. Psycho-social problems had to be looked into especially for those families who had parents who died of the infection. Special features of SARS in children were to be identified. Non-SARS patients were also followed up for any missing cases, studying infectivity.

Summary

The whole exercise was a very special and unusual experience. Having to evacuate patients within a short period of time to admit a highly infectious disease was an unprecedented move in the medical history in Hong Kong. There were many lessons learnt from the exercise, which included risk management in fighting a highly infectious disease. Good planning and preparation are important, and training in infection control essential for staff. Full protection in ICU is important and staff performing high risk procedure like intubation need to be well protected. To have a separate SARS team of staff helped minimise the risk of cross-infection. Though universal precautions need to be established in all areas, it is considered important to protect high-risk patients including those immunocompromised, debilitated patients and pregnant mothers from the infection.