Infection control for SARS in a tertiary neonatal centre

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Infection control for SARS in the neonatal intensive care unit

The Severe Acute Respiratory Syndrome (SARS) is a newly discovered infectious disease caused by a novel coronavirus.[1 2] The virus is believed to be transmitted by droplets and close interpersonal contacts.[3] As no neonatal clinician has any experience in looking after infants born to SARS mothers, stringent infection control measures should be employed to safeguard the wellbeing of the workforce and to avoid nosocomial spread of the disease within the neonatal unit. We summarise here the neonatal infection control policy developed during the recent SARS outbreak at the Prince of Wales Hospital, Hong Kong.

INFECTION CONTROL MEASURES AND TRIAGE POLICY

Triage policy

Before any infants can be admitted into the neonatal unit (NNU), relevant information on maternal history of recent travel and contact with SARS or other forms of acute respiratory illness is checked by the admitting nurse using a specially designed checklist. A proper triage and cohorting policy is essential to separate potentially infected newborns from "clean" infants. The policy creates risk stratified cohorts based on three important considerations: (a) mother diagnosed to have probable SARS[4]; (b) mother with contact history of SARS; and (c) mother with constitutional and respiratory symptoms suggestive of SARS.

Thus, at least four separate areas in the NNU are required to accommodate these major categories (including the pre-existing clean cohort) of infants. However, due to a shortage of isolation facilities in most NNUs, there would likely be mixing of infants requiring intensive care with those who need lower levels of care within the same patient cohort area.

Staff precautions

As the NNU is an acute admission ward, the use of personal protective equipment (PPE) is advocated for all ward areas. Separate locations in the NNU are designated for putting on and removing the PPE in order to minimise contamination of the clean protective equipment. On entering the unit, all healthcare workers and visitors must strictly follow the steps in sequence for putting on the PPE:

(1) shoe covers
(2) hand washing
(3) N95 respirator mask
(4) goggle or visor
(5) cap
(6) waterproof gown
(7) hand rubbing with waterless alcohol antiseptic agent
(8) latex gloves.

Similarly, on leaving the ward area, healthcare workers are advised to strictly follow the steps for removing the PPE:

(1) cap
(2) gown
(3) shoe covers
(4) gloves
(5) hand washing
(6) goggle or visor
(7) N95 respirator
(8) hand rubbing with antiseptic agent
(9) put on a new surgical mask before leaving the ward.

"Police nurses" are stationed at the changing areas at all times to ensure proper gowning and removal of PPE. Changing of PPE is required when moving to and from the clean areas, SARS areas, and labour ward. In addition, non-essential inanimate objects including pens, keys, and other personal items are collected at the ward entrance. Essential equipment such as hospital pagers are put inside a small plastic bag and clipped onto the protective gown before entering the SARS areas. Staff must change gloves and wash or alcohol rub hands after contact with each patient.

Nursing high risk infants

All high risk newborns are nursed inside incubators. Infants requiring intermittent positive pressure ventilation or nasal continuous positive airway pressure (CPAP) support are further sheltered inside a headbox. A negative pressure is created within the headbox by connecting a large suction tube to its interior. Thus, opening the porthole of the incubator will suck in air from the environment rather than pushing air out towards the healthcare workers. A high efficiency bacterial/viral filter is fitted onto the resuscitation bag for manual ventilation, and also incorporated into the exhalation arm of the ventilator circuit. All exhaled gases from the conventional ventilator are sucked into and disposed via the wall suction outlet. Further, a plastic bag is wrapped around the water trap of the ventilator circuit before emptying the contents. Routine endotracheal suction is performed via a closed suction circuit. The secretions are collected in a suction container that is partially filled with disinfectant. A face shield, in addition to regular PPE, is recommended for performing high risk procedures such as tracheal intubation, attending delivery, and the collection of potentially contaminated specimens. The use of nebulisers, high flow oxygen masks, and CPAP are strictly prohibited outside the incubator or in the open ward.

At the beginning of the outbreak in early March, we did not have any guidelines for neonates on how to deal with the situation. We hope that this summary is useful in helping other NNUs to formulate their own infection control measures to fight against this contagious and deadly disease.

EDITOR'S NOTE

Because this subject is highly topical, delay in publication would significantly undermine its value. We have therefore taken the unusual step (for *Archives of Disease in Childhood*) of publishing this short version of the paper as quickly as is practical online, while placing the longer peer reviewed original version, which has a number of useful illustrations in the September issue of the journal.

The full version will appear in *Arch Dis Child Fetal Neonatal Ed* 2003;**88**:Sept.

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3 **Lee N**, Hui D, Wu A, *et al*. A major outbreak of severe acute respiratory syndrome in Hong Kong. *N Engl J Med* 2003;**348**:1986–94.

4 **World Health Organization**: www.who.int/csr/sars/country/2003_05_27/en. Accessed 28 May, 2003.