



# From the frontline of COVID-19 – How prepared are we as obstetricians: a commentary

MSQ Chua,<sup>a</sup> JCS Lee,<sup>b</sup> S Sulaiman,<sup>a</sup> HK Tan<sup>c</sup>

<sup>a</sup> Department of Obstetrics and Gynaecology, KK Women's and Children's Hospital, Singapore City, Singapore <sup>b</sup> Department of Urogynaecology, KK Women's and Children's Hospital, Singapore City, Singapore <sup>c</sup> Division of Obstetrics and Gynaecology, KK Women's and Children's Hospital, Singapore City, Singapore

*Correspondence:* MSQ Chua, Department of Obstetrics and Gynaecology, KK Women's and Children's Hospital, 100 Bukit Timah Road, Singapore City 229899, Singapore. Email: monica.chua@mohh.com.sg

Accepted 2 March 2020.

Please cite this paper as: Chua MSQ, Lee JCS, Sulaiman S, Tan HK. From the frontline of COVID-19 – How prepared are we as obstetricians: a commentary. BJOG 2020; <https://doi.org/10.1111/1471-0528.16192>.

The World Health Organization (WHO) has declared the outbreak of novel coronavirus (2019-nCoV)—now known as Coronavirus Disease (COVID-19)<sup>1</sup>—a global health emergency. Singapore currently stands as the country with the highest number of reported cases of COVID-19 outside of China,<sup>2</sup> excluding patients on a cruise ship offshore of Japan.

It has been a week since the Ministry of Health of Singapore declared an increased alert level to DORSCON Orange using its Disease Outbreak Response System Condition (DORSCON) framework. This indicates that COVID-19 is considered a severe disease which spreads easily from person to person but which has not spread widely in Singapore and is presently being contained. This escalation in framework results in moderate disruption of daily lives through quarantine, temperature screening, and hospital visitor restriction measures.<sup>3</sup>

As such, it is important for us, as obstetricians, to be vigilant and take precautionary measures as frontline healthcare workers. Currently, little is known about COVID-19 but there are valuable lessons to be learned from studies of human coronaviruses (HCoV) and the outbreak of Severe Acute Respiratory Syndrome coronavirus (SARS-CoV) in 2003, to help guide obstetrical management during this current disease outbreak.

In 2009, The Society of Obstetrics and Gynaecologists of Canada (SOGC) published its guidelines for the management of obstetric patients with suspected or probable SARS,<sup>4</sup> after gathering information and studies from the outbreak of SARS back in 2003.

This paper reviews the current literature and SOGC guidelines and shares the clinical practice recommendations and precautions taken by frontline obstetricians and healthcare workers at KK Women's and Children's Hospital (KKH), the largest maternity hospital in Singapore.

## General recommendations

- 1 All pregnant patients who present to the hospital should be assessed and screened for symptoms and risk factors for COVID-19 (e.g. recent travel history, exposure or close contact with recent travellers, fever, upper or lower respiratory tract symptoms).
- 2 Staff working in the triage areas should wear a protective N95 mask and be strictly compliant with hand hygiene.
- 3 On presentation to the triage areas, pregnant patients who meet the screening criteria should be placed in a negative pressure isolation room. The criteria for isolation in a KKH Delivery Suite are as follows:
  - i Travel to OR residence within the last 14 days in China
  - ii History of contact with a healthcare facility in China OR
    - a History of close contact with a confirmed case of COVID-19 within 14 days before onset of illness OR
    - b Person accompanying patient has been to China within the last 14 days OR
    - c Has had frequent or close contact with recent travellers from China (travel history in the last 14 days)
  - iii Fulfils pneumonia criteria regardless of travel/contact history
- 4 Negative pressure isolation rooms should be set up for safe labour and delivery.
- 5 Isolated patients should only be cared for by a dedicated team of doctors and nurses who only care for patients meeting these strict triaging criteria and not care for other low-risk patients.
- 6 Staff who are caring for suspected or confirmed cases of COVID-19 patients should be closely monitored for fever or other signs of infection and should not be

working in the presence of any COVID-19 symptoms. Common symptoms at onset of illness include fever, dry cough, myalgia, fatigue, dyspnoea, and anorexia.<sup>5</sup>

- 7 All staff should wear full personal protective equipment (PPE) before entry to the isolation rooms. This includes a disposable gown, N95 mask, gloves, and eye protection.
- 8 For COVID-19 nasopharyngeal swab specimen collection, all staff should wear a powered air-purifying respirator (PAPR).
- 9 All healthcare workers should be trained and fitted appropriately for N95 masks and PAPR.

## Antepartum pneumonia

Physiological alterations in pulmonary function during pregnancy increases the susceptibility to and severity of pneumonia.<sup>6</sup> Earlier studies have shown that antepartum pneumonia is associated with a high perinatal mortality rate, thus aggressive treatment is required, including supportive measures with hydration, oxygen therapy, and chest physiotherapy.

Ng et al.<sup>7</sup> conducted a pathophysiological evaluation of the placentas of mothers who were infected with SARS. Results from this study revealed changes in placentas that are most likely related to disruption in the maternal placental blood flow during hypoxic episodes of the acute stages of their illness. As such, one of the main aims of management of antepartum pneumonia is prevention and correction of maternal hypoxia.

Currently, there is no proven anti-viral treatment available for COVID-19 patients, although anti-retroviral drugs are being therapeutically trialled on patients with severe symptoms.<sup>8</sup> When proposing new and novel treatments, pregnant patients should be thoroughly counselled on the potential adverse effects for the patient herself as well as the teratogenic effects on her fetus.

### Recommendations

- 1 Supplemental oxygen to maintain oxygen saturations above 95%.
- 2 Consider delivery of fetus to improve maternal oxygenation.
- 3 If requiring mechanical ventilation, pregnant patients to be maintained on left lateral position to maximize uterine blood flow.
- 4 Consider empirical antibiotics to prevent secondary bacterial infections.
- 5 Close and vigilant monitoring and timely interventions to minimise maternal hypoxia.

## Labour and delivery

A recent study conducted by Chen et al.<sup>9</sup> showed no evidence of intrauterine infection of COVID-19 caused by vertical transmission from mothers who developed COVID-19

pneumonia in their third trimesters. However, all nine cases studied were delivered via caesarean section and the authors were unable to analyse whether COVID-19 could be transmitted via vaginal delivery, as no vaginal mucosa samples were taken. Previous studies have shown the possibility of materno-fetal transmission of human coronavirus (HCoV)<sup>10</sup> with evidence of the virus not only in maternal respiratory swabs but also in vaginal swabs. As such, we should aim to reduce the exposure of newborns to all maternal bodily fluids.

### Peripartum recommendations

- 1 Consider performing nasopharyngeal suction before the baby's first breath.<sup>11</sup>
- 2 No delayed cord clamping of umbilical cord so as to facilitate thorough cleansing of baby to remove maternal blood and amniotic fluid as soon as possible after birth.

### Postpartum recommendations

- 1 Infected or suspect mothers should refrain from breastfeeding until they have fully recovered or have been confirmed not to have COVID-19.
- 2 Mothers and newborns are to be isolated separately to prevent neonatal transmission until the mother has fully recovered or has been confirmed not to have COVID-19.
- 3 Workflow needs to be established to coordinate care between obstetricians, neonatologists, midwives and nurses to ensure safety of mother and baby.

The potential need to separate mothers with or suspected to have COVID-19 from their newborns, and therefore unable to breastfeed, may impede early bonding as well as establishment of lactation. These factors will inevitably cause additional stress for mothers in the postpartum period. In addition to caring for their physical wellbeing, medical teams should also pay more attention to the mental wellness of these mothers, providing the appropriate concern and support when needed.

## Reflections of frontline obstetricians

In response to the COVID-19 outbreak, the Division of Obstetrics and Gynaecology at KKH have established isolation (ISO) teams consisting of dedicated teams of doctors and nurses assigned to care for patients who fit the criteria for isolation at screening. This team is supported by an on call 'clean' team for updates, senior obstetricians, and also the KKH on-site Infectious Disease physicians for advice at all hours of the day.

As doctors assigned to this team, we ourselves are 'isolated' during our daily 12-hourly shifts to minimise contact with other patients and colleagues, with the aim to reduce the risk of exposure and potential transmission. The following outlines some impacts of isolation on different aspects of our lives.

As we aim to restrict movements to minimise contact and transmission, doctors in isolation become reliant on

others—from practical things such as food and drink for sustenance, to topping up of PPE and medical equipment in the isolation rooms. This comes with a sense of helplessness and guilt for having to trouble colleagues who are themselves busy during this period of stretched medical manpower. Conversely, during our lull periods, we are not able to assist our colleagues with their work to avoid contamination of ‘clean’ patients.

As our knowledge of COVID-19 increases, hospital recommendations on infection control, COVID-19 screening, and isolation change rapidly in accordance with the latest evidence. As frontline doctors, we need to keep our fingers on the pulse of the latest recommendations to keep our patients, and ourselves, safe.

These extended working hours also inevitably mean less time for usual activities outside of work such as family, friends, and general wellbeing. Although we keep ourselves busy during our shifts, the prolonged duration of isolation increases stress levels, restlessness, and physical inactivity as we are confined to a small physical area. Lack of exercise affects both our physical and mental health;<sup>12</sup> exercise has been shown to reduce anxiety, depression, and negative mood and to improve self-esteem and cognitive function, all characteristics important for maintaining resilience during this disease outbreak.

We were informed only a few hours after the declaration of DORSCON Orange in Singapore that we would be part of the first ISO team. This has been followed by feelings of anxiety and stress as we face many uncertainties, and the growing fear that with the rising number of cases of COVID-19, each patient we see presents a greater risk to our personal health and that of the people around us. But there is the relief that comes with each negative swab result as we continue our duties as the ISO team for this uncertain but seemingly dangerous infection.

Our families and the Singapore general public have been incredibly supportive during this difficult period, with volunteers providing travel services and corporations providing free food to healthcare workers. Our gratitude is unspoken; we keep our distance in the hope of keeping them safe.

We are certainly not alone in these thoughts and plan to study formally the wellbeing of our colleagues who serve on current and future ISO teams. Meanwhile, it is imperative to remind all healthcare workers of the importance of self-protection, hand hygiene, and self-care as we continue in our mission to care for patients who are at the heart of all that we do.

### Disclosure of interests

None. There was no financial support. Completed disclosure of interest forms are available to view online as supporting information.

### Contribution to authorship

MSQC: Preparation, manuscript original writing. JCSL, SS, and HKT: Conceptualisation, supervision, manuscript review, and edit.

### Details of ethics approval

No ethics approval applicable for this commentary.

### Funding

There was no financial support for this commentary.

### Acknowledgements

The authors would like to acknowledge the valuable input from Dr Ni Ni Soe, staff registrar and fellow isolation team member, Department of Obstetrics and Gynaecology, KK Women’s and Children’s Hospital. ■

### References

- 1 WHO. *Director-General’s remarks at the media briefing on 2019-nCoV on 11 February 2020* [Internet]. Who.int.; 2020. [https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020]. Accessed 15 February 2020.
- 2 WHO. *Coronavirus disease 2019 (COVID-19) Situation Report – 25* [Internet]. WHO; 2020. [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200214-sitrep-25-covid-19.pdf?sfvrsn=61dda7d\_2]. Accessed 15 February 2020.
- 3 MOH. *Being Prepared for a Pandemic* [Internet]. Moh.gov.sg. 2020. [https://www.moh.gov.sg/diseases-updates/being-prepared-for-a-pandemic]. Accessed 15 February 2020.
- 4 Maxwell C, McGeer A, Young Tai K, Sermer M, Farine D, Basso M, et al. Management guidelines for obstetric patients and neonates born to mothers with suspected or probable severe acute respiratory syndrome (SARS). *Int J Gynecol Obstet* 2009;107:82–6.
- 5 Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. *JAMA* 2020. [Epub ahead of print]. https://doi.org/10.1001/jama.2020.1585
- 6 Weinberger S, Weiss S, Cohen W, Weiss J, Johnson T. Pregnancy and the lung. *Am Rev Respir Dis* 1980;121:559–81.
- 7 Ng W, Wong S, Lam A, Mak Y, Yao H, Lee K, et al. The placentas of patients with severe acute respiratory syndrome: a pathophysiological evaluation. *Pathology* 2006;38:210–8.
- 8 Boseley S *China trials anti-HIV drug on coronavirus patients* [Internet]. The Guardian. 2020. [https://www.theguardian.com/world/2020/feb/07/china-trials-anti-hiv-drug-coronavirus-patients]. Accessed 15 February 2020.
- 9 Chen H, Guo J, Wang C, Luo F, Yu X, Zhang W, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. *Lancet* 2020;395:809–15.
- 10 Gagneur A, Dirson E, Audebert S, Vallet S, Quillien M, Baron R, et al. Vertical transmission of human coronavirus. Prospective pilot study. *Pathol Biol (Paris)* 2007;55:525–30.
- 11 Wong S, Chow K, Leung T, Ng W, Ng T, Shek C, et al. Pregnancy and perinatal outcomes of women with severe acute respiratory syndrome. *Am J Obstet Gynecol* 2004;191:292–7.
- 12 Sharma A, Madaan V, Petty F. Exercise for mental health. *Prim Care Companion J Clin Psychiatry* 2006;08:106.