Correspondence

Re: Novel Coronavirus COVID-19 in late pregnancy: Outcomes of first nine cases in an inner city London hospital

We would like to share our experience of nine laboratory-proven COVID-19 mothers delivered at a London inner-city hospital between 7th of March and 22nd April 2020. In all cases, positive diagnosis was based on real time reverse transcriptase polymerase chain reaction (RT-PCR) of maternal nasopharyngeal swabs.

The median age and gestation at delivery were 31 years (range 18–39) and 39 weeks (range 27–39) respectively and two of the nine women were delivered by emergency caesarean section (CS) for COVID-19 pneumonia and deteriorating maternal respiratory function. Of the remaining seven, one mother had a normal vaginal delivery, six underwent elective CS for obstetric indications while an emergency CS was performed in one woman for suboptimal cardiotocography (Table 1). Seven of our nine women (78%) had mild to moderate prodromal symptoms not requiring admission (such as fever, cough, myalgia, sore throat, anosmia): these women were only screened due to a high index of suspicion rather than severity of complaints. The infants were immediately isolated from the mothers at birth and had RT-PCR for SARS-CoV-2 nucleic acid nasopharyngeal swabs performed. Only one of the nine babies was subsequently confirmed as COVID-19 positive (patient 1) based on nasopharyngeal RT-PCR.

We would like to focus on the first two mothers who were delivered by emergency CS due to inability to maintain oxygen saturation and to highlight the accompanying lymphopenia that were previously described in the cases reported by Sutton et al. [1] and Zeng et al. [2].

Patient 1: A 33 year old woman with diet controlled gestational diabetes mellitus was admitted at 39 weeks gestation with flu-like symptoms and productive cough. A provisional diagnosis of pneumonia was made but she developed chest pain and became tachyypnoeic. Chest X-ray revealed right basal consolidation and lymphopenia was noted (0.92 × 10^9/L; normal: 1.2–3.6). Maternal nasopharyngeal swabs were positive for SARS-CoV-2 RT-PCR and she underwent an emergency CS for sudden deterioration of respiratory function, requiring 15 L/min of oxygen to maintain saturation of >95%. A live infant 4.165 kgs was delivered with Apgar scores of 5 minute and 9 minute and was immediately separated from the mother. Following delivery, the patient continued to desaturate (80–85%) on 100% of oxygen and was transferred to a tertiary centre for extracorporeal membrane oxygenation (ECMO). The baby, subsequently confirmed as COVID-19 positive, developed pyrexia and exhibited signs of pneumonia on the sixth day but settled with benzylpenicillin and gentamicin.

Patient 2: A 29 year old lady was admitted at 27 weeks gestation with myalgia, cough, pyrexia >38.4°C and dyspnoea. SARS-CoV-2 was diagnosed on basis of nasopharyngeal RT-PCR and chest X-ray showed basal consolidation (Fig. 1). She was commenced on intravenous clarithromycin and cefuroxime but became tachypnoeic and was unable to maintain oxygen saturation. Lymphopenia (1.05 × 10^9/L; normal: 1.2–3.6) was noted and an emergency CS was performed for deteriorating maternal respiratory function. She required mechanical ventilation for four days post-delivery before being “stepped down”. The baby weighing 1.2 kgs with Apgars of 2 minute and 6 and 5 minutes and required intubation because of prematurity. The baby was negative for nasopharyngeal, amniotic fluid and placental swabs RT-PCR for SARS-CoV-2 and was weaned off ventilation after 10 days.

Table 1 shows that maternal symptoms can be variable and of interest is that cough (8/9) and anosmia (7/9) appear to be the commonest presentations in this small series. We had initially followed advice from Chinese literature which recommended isolation of the infected woman and her baby for 14 days [2]. However, given the limited data and considering the potential detrimental effects on feeding and bonding, the Royal Colleges of Midwifery and Obstetricians and Gynaecologists have now jointly issued a guideline [3] that COVID-19 women and their healthy babies should be kept together in the postpartum period. Similarly, breast milk of affected mothers [4] has tested negative for COVID-19 and current evidence suggest that breast feeding is not contraindicated [3].

The most recent systemic review of six studies involving 48 delivered women indicates low likelihood of vertical transmission [5], although transplacental maternal-fetal transmission

![Fig. 1. Chest X-ray of patient 2 showing lower lobe patchy consolidation consistent with (COVID) pneumonia.](https://www.elsevier.com/locate/ejogrb)
Table 1
Showing maternal and fetal outcomes (n = 9).

| Patient | Age (yrs) | Parity | CXR | Gestation (wks) | Mode of delivery | Indication | PMH | Fever | Cough | Myalgia and joint pains | Runny nose | Sore throat | Lethargy | Dyspnoea | Anosmia | Fetal weight (g) | Fetal COVID status | Fetal outcome |
|---------|-----------|--------|-----|-----------------|------------------|-------------|-----|-------|-------|------------------------|------------|-------------|----------|-----------|---------|-----------------|------------------|--------------|
| 1       | 36        | 2 + 0  | Consolidation | 38     | Em CS           | Maternal pneumonia and respiratory distress | Gestational diabetes | Y    | Y     | N     | N                   | Y          | Y           | Y        | Y         | N       | 4165            | Positive         | Fetal pneumonia day 6 but recovered well Apgars 5, 9 Ventilated for 10 days | Fetal outcome |
| 2       | 29        | 2 + 1  | Consolidation | 27     | Em CS           | Maternal pneumonia and respiratory distress | None | Y    | Y     | N     | N                   | N          | N           | Y        | Y         | N       | 1200            | Negative         | Apgars 2, 6 Observation only due to poor feeding | Fetal outcome |
| 3       | 31        | 2 + 3  | Normal     | 35     | Em CS           | Pathological CTG not in labour | None | Y    | Y     | Y     | N                   | Y          | Y           | Y        | Y         | N       | 2700            | Negative         | Well Apgars 8, 9 | Fetal outcome |
| 4       | 31        | 0 + 1  | Consolidation | 39     | El CS           | Breech | Asthma | Y    | N     | N     | N                   | Y          | N           | N        | Y         | N       | 3370            | Negative         | Fetal outcome |
| 5       | 22        | 1 + 0  | Consolidation | 38     | NVD N/A        | None | None | N    | Y     | Y     | N                   | N          | N           | Y        | N         | Y       | 4300            | Negative         | Apgars 8, 9 | Fetal outcome |
| 6       | 39        | 4 + 1  | Not done   | 37     | El CS           | 3 previous CS | Insulin dependent diabetes hypertension | N    | Y     | N     | N                   | Y          | N           | Y        | N         | Y       | 2500            | Negative         | Well Apgars 8, 9 | Fetal outcome |
| 7       | 18        | 1 + 0  | Not done   | 39     | El CS           | Previous CS and maternal request | None | N    | Y     | Y     | N                   | N          | N           | N        | Y         | Y       | 3060            | Negative         | Well Apgars 8, 9 | Fetal outcome |
| 8       | 38        | 3 + 1  | Not done   | 39     | El CS           | 3 previous CS | None | N    | Y     | Y     | N                   | Y          | Y           | Y        | Y         | Y       | 3540            | Negative         | Well Apgars 8, 9 | Fetal outcome |
| 9       | 34        | 0 + 0  | Not done   | 39     | El CS           | Maternal request | None | N    | Y     | Y     | N                   | N          | Y           | N        | Y         | Y       | 3560            | Negative         | Well Apgars 8, 9 | Fetal outcome |
have been reported [1,2] including in our first case (where mother and baby were immediately separated and membranes had remained intact until CS). We can postulate that there may be a relationship between vertical transmission with maternal viral load as this was our most respiratory-compromised patient.

The same systemic review [5] noted that 96% of COVID-19 women were delivered by CS; however, we suspect that these were likely to be elective procedures for obstetric indications, like the last four women in our series, where COVID-19 had been detected several weeks prior to delivery in relatively stable patients.

We end this letter by reminding clinicians that many pregnant women with COVID-19 present with mild or even no symptoms. In the United Kingdom, we currently do not have the capacity or funds to screen all pregnant women as recommended by Sutton et al. [1] but any recent onset of cough and anosmia warrants a high level of suspicion for screening.

**Declaration of Competing Interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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