

Delivery Planning in an Intubated Patient with Respiratory Failure: A Case Study

Dr Magdalena Walc, MBBS, Flinders Medical Centre, South Australia

INTRODUCTION:

Hypoxic respiratory failure affects up to 1 in 500 pregnancies. The physiological changes in pregnancy add significant complexity in managing these patients. Evidence and clear guidelines are lacking regarding indications for delivery, and fetal monitoring.

AIMS:

Consider the complexity of hypoxic respiratory failure in a pregnant patient and the dilemma of timing of delivery.

CASE DETAILS:

A G1P0 at 29+4 weeks presented to a rural hospital with a 1-week history of respiratory illness. She had a normal BMI, a history of mild asthma and cannabis use.

She was treated with IV Ceftriaxone and Azithromycin. On day 2 of admission, she further deteriorated, leading to a transfer to a major tertiary hospital ICU. She tested positive for Influenza A.

She was initially saturating 90% on 6L 100% oxygen, respiratory rate (RR) 33. She further decompensated with saturations to 82%, RR 44. Within an hour of arrival at the ICU, she was intubated.

She was commenced on Azithromycin, Tazocin, Vancomycin and Oseltamivir. Celestone loading was given. Frusemide was utilised.

A chest X-ray demonstrated consolidation with patchy opacities concerning for secondary bacterial infection with possible lung abscesses (image 1). WCC 7 with CRP 202. A growth ultrasound showed an EFW 1.5kg (46%). CTG was normal (image 2)

She was deemed to be in hypoxic respiratory failure in the setting of Influenza A, with superimposed bacterial pneumonia and an element of fluid overload.

Due to the stabilisation of her clinical state post-intubation, the decision to hold off delivery and gain gestation was made. CTGs undertaken twice daily remained normal.

On day 5 of intubation, extubating was considered. Throughout the day she had increased oxygen requirement, and the plan was abandoned.

After 7 days of intubation, she was successfully extubated and placed onto high-flow. She was re-intubated later that day due to poor saturations. She received a Celestone booster and was commenced on magnesium sulphate in preparation of possible delivery.

Image 1: Chest X-ray on presentation

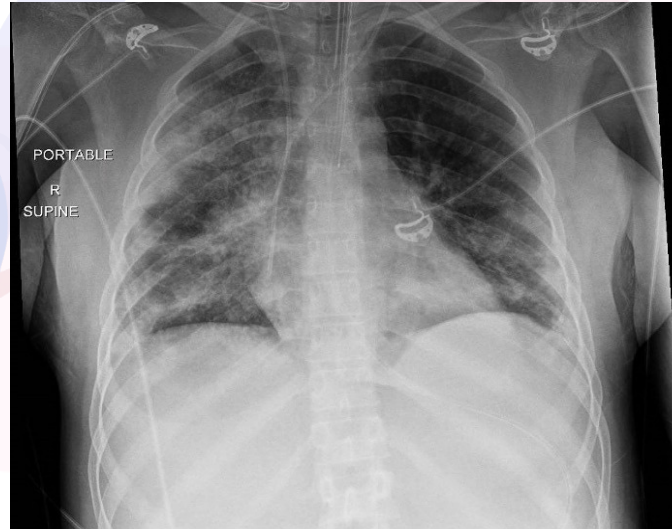


Image 2: CTG on presentation to tertiary hospital

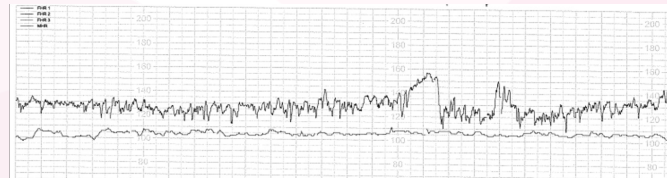


Image 3: CTG 1 day prior to delivery. First concerns of abnormality on CTG. Patient on magnesium sulphate

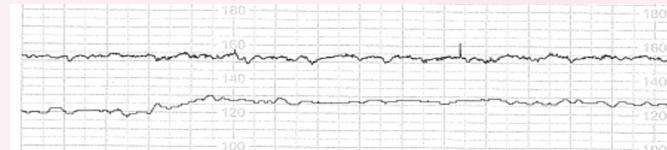
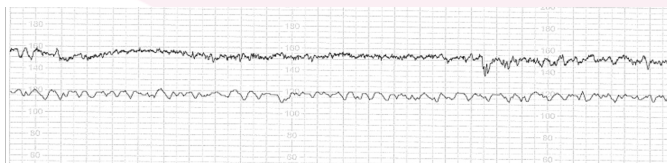


Image 4: CTG the morning of delivery



Bedside US showed an AFI 16, with normal dopplers, but minimal movements seen. The CTG showed absent to reduced variability, no decelerations, and no accelerations (image 3).

A multi-dispersary discussion occurred, with the decision was made to progress with delivery. A caesarean was performed the next day at 31 weeks gestation.

RESULTS:

She made a gradual improvement in oxygenation post-delivery and was successfully extubated on day 3 post-operatively. She was discharged on day 9 postnatal with full recovery.

Baby at birth showed poor respiratory effort with pneumoperitoneum and bilateral pneumothoraxes. On day 3 baby underwent ileostomy due to a spontaneous perforation in the distal ileum. This was re-anastomosed at 3 months of age.

DISCUSSION:

The management of an intubated pregnant patient with acute respiratory failure is a tricky task. No guidelines exist, and literature is lacking to help guide decision-making (mainly case studies, and the majority regarding Covid-19). With the complexity of each case – a one-size-fits-all rule – is difficult to establish.

A crucial question is about delivery timing. The physiologic adaptations at delivery - maximisation of cardiac output, autotransfusion of up to 500 mL, catecholaminergic surge, release of inflammatory mediators and considerable fluid shifts – can exacerbate illness. Dysregulated of the inflammatory cascade, endothelial dysfunction, pulmonary oedema, myocardial oedema, and cardiac dysfunction can occur. Thus the timing of delivery needs to ideally be delayed until stability, unless the pregnancy has reached full term, fetal status is non-reassuring, or maternal status is so that the benefits outweigh the risks¹.

Some resources recommend birth if acute deterioration in maternal or fetal status occurs despite the initiation of appropriate interventions². The consensus appears to be that delivery should be highly considered if 32 to 34 weeks gestation has been reached. Swedish guidelines recommend delivery within 24 hours in cases where the mother requires more than 5L of oxygen².

A recurrent theme is the importance of a multidisciplinary team – the obstetric, neonatal and interventionist, at a minimum, meeting regularly to decide when the risks outweigh the benefits of prolonging pregnancy.

There is no consensus if intermittent, or continuous is the best practice, for an ICU patient³. Regarded by some as the 'fifth vital sign', changes can signify worsening illness in the mum.

1. Schnettler, W.T., Ahwel, Y.A., Sugag, A. (2020). 'Severe acute respiratory distress syndrome in COVID-19-infected pregnancy: Obstetric and intensive care considerations', AIOG MFM, 2(3)
2. Troiano, N.H., Richter, A. and King, C. (2022). Acute Respiratory Failure and Mechanical Ventilation in Women With COVID-19 During Pregnancy. Journal of Perinatal & Neonatal Nursing, 36(1), pp.27–36.
3. Zieleskiewicz, L., Chantray, A., Duclos, G., Bourgoin, A., Mignon, A., Deneux-Tharaux, C. and Leone, M. (2016). Intensive care and pregnancy: Epidemiology and general principles of management of obstetrics ICU patients during pregnancy. Anaesthesia Critical Care & Pain Medicine, 35, pp.S51–S57