

Tachypnoea and COVID-19: Cause and effect?

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Introduction

COVID-19 is a multisystem disorder that usually manifests as respiratory symptoms. However, it is important to be aware that metabolic derangement can also occur, especially in the susceptible pregnant population. COVID-19 infection has also been shown to precipitate ketoacidosis in patients without diabetes which can cause symptoms usually seen in a patient with deteriorating respiratory function [1].

Case Presentation

- A 29-year-old (G3P2) attended hospital at 37 weeks gestation with breathlessness, lethargy, nausea, reduced appetite and fever having returned a positive COVID-19 PCR test 6 days earlier. Physical examination confirmed tachypnoea (>25) with normal lung fields on chest x-ray. An ABG on air showed compensated metabolic acidosis (Table 1) with a raised anion gap (18mmol/L).
- There was no evidence of foetal compromise, however obstetric concerns regarding her respiratory rate in the presence of COVID-19 led to discussion about expediting delivery.
- This was complicated by treatment dose dalteparin being given in A+E due to the initial concerns of a PE before point of care tests revealed ketonaemia (5mmol/L) and ketonuria.
- With a new diagnosis of euglycaemic starvation ketoacidosis, the dalteparin was stopped and treatment commenced with IV 10% glucose (100ml/hr).
- Twenty four hours later, her observations normalised with an improvement in her ABG result (Table 1) and resolution of ketonaemia.
- An uneventful caesarean delivery was performed 48 hours after admission under spinal anaesthesia.

	pH	PaO_2	$PaCO_2$	Lactate	HCO_3^-	BE	Glucose
At presentation	7.35	12	2.2	0.6	14	-17	5.4
After treatment	7.36	13	3.9	0.7	19	-7	7.8

Table 1: ABG results at presentation and following treatment with IV 10% glucose.

Discussion

- This case demonstrates the importance of recognising that COVID-19 can manifest symptoms outside of the respiratory tract. Despite a positive diagnosis of the virus, the presenting features were due to metabolic derangement caused by starvation and vomiting.
- The hypermetabolic state of pregnancy predisposes to severe metabolic disturbance due to insulin resistance as a result of placentally-derived catabolic hormones in addition to reduced renal buffering capacity [2]. The stress response caused by infection would aggravate the presentation further.
- If immediate delivery was required, general anaesthesia (GA) was the only option as treatment dose dalteparin was given <24hrs earlier precluding a neuraxial block. A GA may have worsened the metabolic derangement due to the difficulty, when under anaesthesia, to replicate the patient's own respiratory compensation for the severe acidaemia.

References

1. Pikovsky M, Tan MY, Ahmed A,et al. Euglycaemic ketoacidosis in pregnant women with COVID-19: two case reports. BMC Pregnancy Childbirth. 2021 Jun 16;21(1):427.
2. van Amesfoort JE, Werter DE, Painter RC, et al. Severe metabolic ketoacidosis as a primary manifestation of SARS-CoV-2 infection in non-diabetic pregnancy. BMJ Case Reports CP 2021;14:e241745