A case of starvation ketoacidosis in pregnancy

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Starvation ketosis is a rare cause of life-threatening **metabolic acidosis** in late pregnancy.

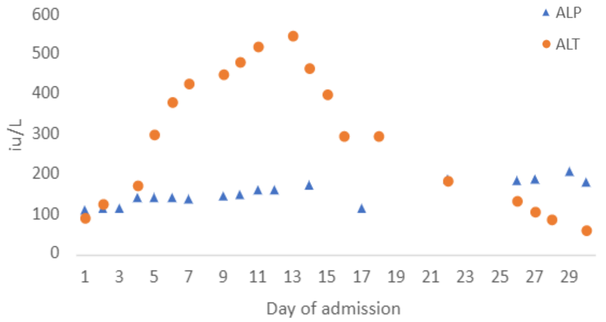
We report the case of a woman who developed ketoacidosis secondary to **prolonged vomiting & starvation.**

Preoperative optimisation of high anion-gap metabolic acidosis may include**:** discussion with intensive care, fluid resuscitation with **IV glucose** & **bicarbonate**.

Case report

- 40-year-old primiparous woman, admitted at 32/40 gestation with right upper quadrant pain, bloody, bilious vomiting, anorexia and dehydration.
- Initial investigations: elevated liver enzymes, blood ketones 4, base deficit -8.3, raised lipase (252).
- Her liver function deteriorated over the following ten days (Figure 1).

Figure 1: Liver function trend during admission



- Non-invasive liver screen, abdominal ultrasound and MRCP were unremarkable. Her anorexia worsened, she developed refeeding syndrome and received IV electrolyte replacement.
- Morphine PCA was commenced by the acute pain team to manage her abdominal pain.

Table 1: Perioperative VBG analysis

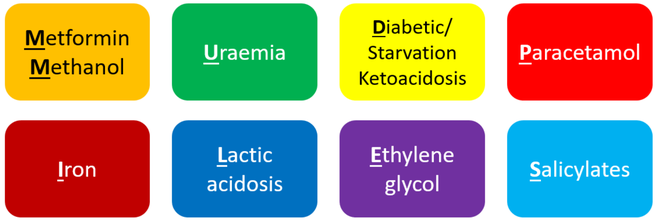
	16:33 (Pre-delivery)	**17:53** (Recovery)	**23:00**
pH	**7.31**	**7.29**	7.34
PCO2 (kPa)	2.8	4.8	5.1
PO2 (kPa)	7.4	2.5	6
Lactate (mmol/L)	0.8	2.1	0.9
BE (mmol/L)	**-13.7**		-4.8
HCO3 (mmol/L)	**14**		20.8
Na (mmol/L)	132	130	132
K (mmol/L)	3.9	3.8	3.1
Cl (mmol/L)	106	105	102
Anion gap	**16.5**		13.7

- She remained an in-patient until decision to deliver at 36/40.
- Preoperative blood gas showed **metabolic acidosis with a raised anion gap** (Table 1). Blood ketones were **5.2**.
- An Intensivist advised fluid resuscitation with **10% glucose** and **1.26% bicarbonate**.
- Emergency caesarean section was performed under spinal anaesthesia.
- Estimated blood loss was 600ml and a live infant was delivered in good condition.
- Metabolic derangement and ketosis improved rapidly after delivery (Table 1).
- The patient was discharged home 48 hours later.

Discussion

Starvation is a cause of liver enzyme derangement. Other differential diagnoses were: dehydration, acute fatty liver of pregnancy, pancreatitis and atypical HELLP syndrome. The blood gas pre-delivery showed **compensated anion gap metabolic acidosis**, likely secondary to **starvation ketosis** (Table 1, Figure 2). Physiological acid-base changes that occur during pregnancy reduce the body's buffer capacity. Vomiting in this context can exacerbate acid-base disturbances, whilst fasting depletes hepatic glycogen stores and accelerates lipolysis, leading to ketone body generation and thus acidosis.

Figure 2: Causes of high anion gap metabolic acidosis (MUD PILES): *accumulation of organic acids or impaired proton excretion*



Regardless of aetiology, untreated severe metabolic acidosis in pregnancy causes fetal acidaemia & hypoxaemia, with sequelae of prematurity, impaired neurodevelopment, and intrauterine death. Early recognition of starvation ketosis and prompt treatment with IV glucose may prevent the development of severe acidosis and requirement for IV bicarbonate, early delivery and admission to ICU.

References

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- Hui L, Shuying L. Acute starvation ketoacidosis in pregnancy with severe hypertriglyceridemia: A case report. *Medicine (Baltimore)*. 2018;**97**(19):e0609.