

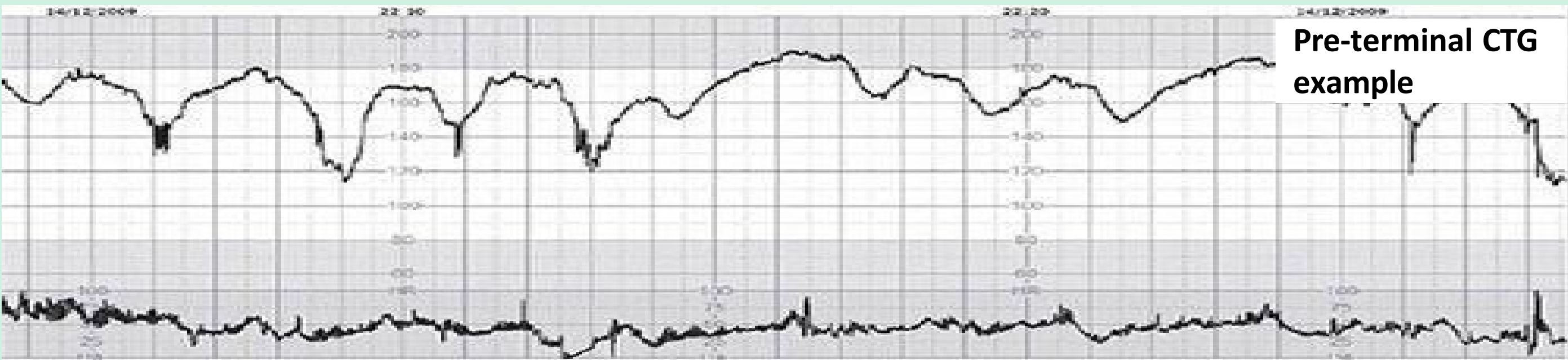
Diabetic Ketoacidosis in Pregnancy Presenting with Acute Concerns About Fetal Wellbeing

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INTRODUCTION

- Diabetic ketoacidosis (DKA) is a serious complication of diabetes usually characterised by hyperglycaemia, metabolic acidosis and ketosis.
- It occurs most commonly in type 1 diabetes (T1DM) but can occur in type 2 and gestational diabetes (GDM).
- Typical clinical features include nausea, vomiting and abdominal pain, with altered mental state, dehydration and shock if untreated.
- Incidence in pregnancy is 0.5– 3%, often occurring in the third trimester.
- DKA carries significant risk of both maternal and fetal morbidity and mortality.



CASE PRESENTATION

A 23-year-old nulliparous woman with T1DM presented at 38+2 weeks of pregnancy with a history of ruptured membranes and uterine contractions.

Admission CTG showed deep, broad fetal heart decelerations with loss of variability. A decision was made for immediate Caesarean section and delivery was undertaken promptly under general anaesthesia.

At delivery, the infant was pale and floppy with no respiratory effort and immediate resuscitation was commenced.

The maternal blood sugar was noted to be 18 and blood ketone level found to be 5.6. Arterial blood gas revealed a metabolic acidosis with pH of 7.17, base deficit of 15 and bicarbonate of 13, confirming a diagnosis of DKA. The patient was transferred to ITU for further management and made a rapid recovery.

Cord blood gas on the infant revealed a profound metabolic acidosis with pH of <6.8, lactate of 17.1 and incalculable base deficit. The infant was placed on CPAP and treated with fluids and antibiotics. The metabolic acidosis resolved completely by four hours of age and CPAP was successfully discontinued at five hours.

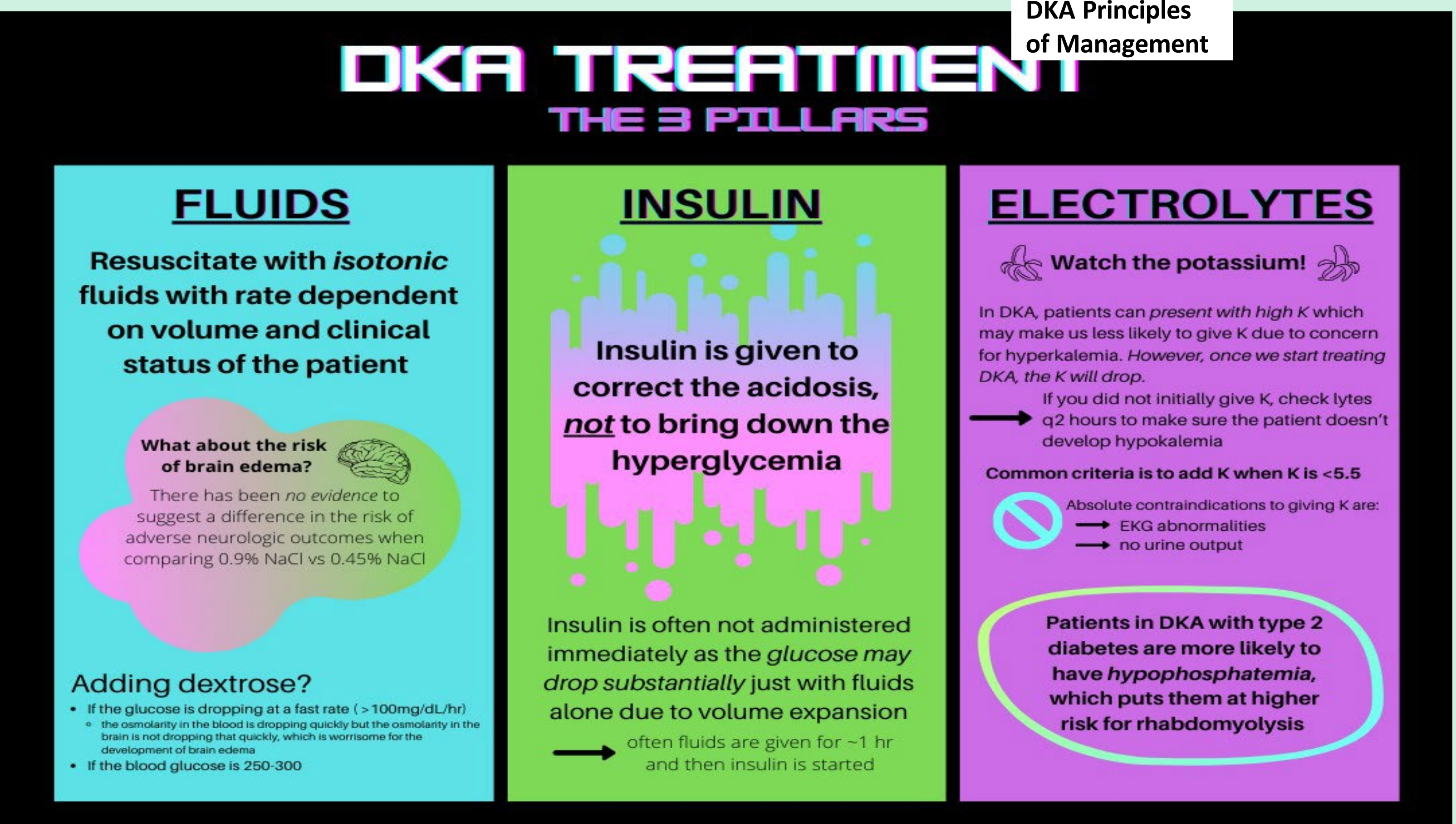
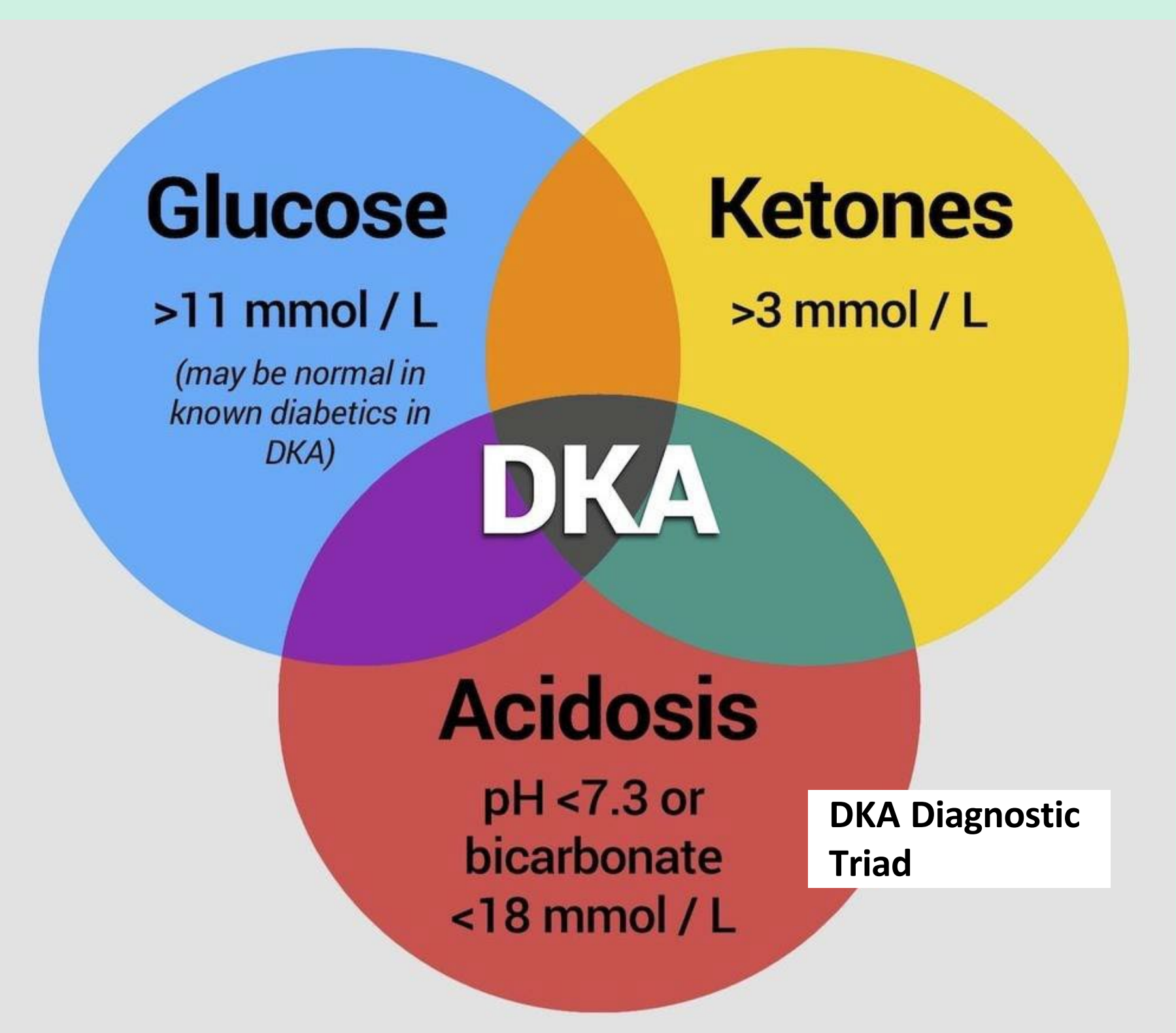
DISCUSSION

The increased risk of DKA in pregnancy is largely due to the normal physiological adaptations of pregnancy which allow for adequate delivery of glucose to the fetus and placenta.

- Insulin resistance occurs due to higher levels of oestrogen, progesterone, cortisol and placental lactogen.¹
- Increased lipolysis to allow for increased carbohydrate availability to the fetus.²
- Increasing progesterone levels cause an increase in minute ventilation, whilst TLC is reduced as pregnancy progresses. This causes a respiratory alkalosis which is compensated for with renal excretion of bicarbonate, thus reducing buffering capacity during an acute acidotic state.
- Hyperglycaemia is potentiated by decreased gastric motility caused by increased progesterone.

DKA may occur in the presence of precipitating factors, most commonly infection, use of steroid medication in the context of potential premature delivery and medication errors.³ It can present diagnostic challenges in pregnancy as it tends to occur at lower blood sugar levels or even in the presence of euglycaemia.³ This is thought to be largely due to haemodilution, increased placental glucose transportation and increased glomerular filtration rate leading to osmotic diuresis.⁴

DIAGNOSIS & MANAGEMENT



Prompt recognition and initiation of management is essential to avoid adverse outcome. Fetal distress and hypoxia are common features and worsen as DKA continues. There is significant risk of fetal demise, reported to be as high as 36%.⁶ Maternal mortality and morbidity is thought to be equivalent to DKA in the non-pregnant population.

Management should involve immediate IV fluids, with prompt initiation of fixed rate insulin infusion and treatment of precipitating factors. There should be involvement of medical/endocrinology and HDU/ITU teams.⁵ Emergency caesarian section may be considered on a case-by-case basis.

CONCLUSION

- There is an increased risk of DKA in pregnancy due to physiological changes pre-disposing to a hyperglycaemic and ketotic state.
- DKA in pregnancy can carry risk of significant adverse outcomes for both mother and fetus.
- Prompt diagnosis is essential to enable swift initiation of treatment.
- Practitioners should have high clinical suspicion of DKA in all unwell pregnant women, particularly if they have known diabetes.
- DKA should be considered at lower blood glucose levels and in absence of common symptoms in pregnancy.
- Management should include obstetric, medical and HDU/ITU teams

Fetal distress may be the only presenting feature of DKA in pregnancy.

It is an important differential diagnosis in acute fetal distress and clinicians should maintain a high index of suspicion, even in the absence of characteristic maternal features.

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