

PHENYLKETONURIA IN PREGNANCY

Adam Jakes, Patty Nguyen, Robin Lachmann,
Matt Cauldwell, Ingrid Watt-Coote

Phenylketonuria (PKU) – *autosomal recessive, ~1:10,000 births*

- Rare metabolic disorder characterised by the inability to utilise the essential amino acid phenylalanine (Phe).
- If untreated, it can lead to intellectual disability, seizures, and mental health disorders.
- Treatment is with a low-protein diet in conjunction with Phe-free protein substitutes.

Pregnancy risks if poorly controlled:

- *Intrauterine growth restriction*
- *Congenital heart defects (up to 10%)*
- *Microcephaly and facial dysmorphism*
- *Development delay (motor)*

CASE REPORT

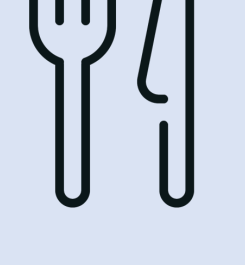
- 28-year-old woman with phenylketonuria presented in her first pregnancy.
- Unrestricted protein diet prior to pregnancy, with booking Phe level of 708umol/L.
- Blood spot Phe levels were measured three times a week and monitored by her specialist metabolic team.
- Sapropterin was started at 11 weeks but stopped after genetic testing predicted a phenotype unresponsive to Sapropterin.
- Pregnancy-related nausea impacted her ability to consume adequate calories, in turn affecting her Phe levels.
- Her Phe tolerance increased in the 2nd trimester requiring 4g protein supplementation, further increasing to >10g by the 3rd trimester.
- Serial growth scans (28 and 36 weeks) and fetal echocardiogram were normal.
- Anaesthetic review recommended avoidance of large doses of propofol if a general anaesthetic is required due to susceptibility to propofol infusion syndrome.

Phe levels <360 µmol/L = No harmful effect on the fetus.

Phe levels:

Pre-pregnancy: 708umol/L
1st trimester: 407umol/L
2nd trimester: 205umol/L
3rd trimester: 159umol/L

ANTENATAL CARE

-  Dried blood spot Phe level testing x3/week
- Target range during pregnancy is 100-250 µmol/L
-  Early antiemetic prescribing for nausea/vomiting
-  Fetal echocardiogram and serial growth scans
-  Anaesthetic review
-  Higher dietary protein requirement in 3rd trimester

INTRAPARTUM CARE

- Care determined by obstetric risk factors
- Can use midwifery-led unit if eligible.
- PKU alone is not an indication for continuous electronic fetal monitoring.
- Avoid large doses of propofol (if GA)

POSTPARTUM CARE

- Breastfeeding is safe
- Neonatal heel pick test (day 5)



CONCLUSIONS

A multidisciplinary team approach including obstetric medicine, midwives, inherited metabolic disease doctors and metabolic dietitians is required when supporting women with phenylketonuria in pregnancy.

Sapropterin (tetrahydrobiopterin), a cofactor of enzymes used in the degradation of phenylalanine, appears safe in pregnancy, but data is limited.