The influence of intrauterine growth restriction and brain sparing effect on neonatal lactate

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BACKGROUND

- Intrauterine growth restriction (IUGR) is defined as an estimated fetal weight (EFW) measurement that is < 10%ile or an abdominal circumference (AC) measurement that is < 3%ile for the corresponding fetal gestational age (GA).
- Elevated neonatal lactate levels are associated with poor outcomes (see “Concept” section).
- However, it is known that how postnatal lactate levels are influenced by intrauterine growth restriction with brain sparing physiology, a state which is achieved in the setting of chronic hypoxia and catabolism.

METHODS

- Retrospective cohort study
- Primary outcome: first lactate level drawn within 24 hours of life, lactate ≥2 mmol/L deemed clinically relevant

OBJECTIVE

To compare neonatal lactate, as a marker of catabolism and chronic hypoxia, in infants with intrauterine growth restriction and brain sparing effect (IUGR+BS) to gestational age (GA) matched controls

CONCEPT

Elevated neonatal lactate is associated with poor neonatal outcomes.

RESULTS

- Median lactate level (P=0.001)
  - Control vs. Normal: IUGR (1.6 ± 1.8 mmol/L)
  - Elevated lactate levels were more frequent in IUGR+BS cohort
    - Baseline: 42.9% vs. 5.4% (P=0.001)
    - 6 hours: 39.2% vs. 3.7% (P=0.003)

- Both cohorts showed similar GA at delivery (28 weeks, P=0.4)
- No difference was seen in:
  - Fetal Factors: 5 minute APGAR <7, immediate ventilation, assisted ventilation > 6 hours, and sepsis categories
  - Maternal Factors: Diabetes, abruption, steroid administration

CONCLUSION

Elevated neonatal lactate in infants who were IUGR+BS supports the hypothesis that brain sparing is a marker for more severe uteroplacental insufficiency in IUGR fetuses and associated adverse outcomes not explained by variations in obstetric influences.