

LEAD EXPOSURE DURING PREGNANCY AND ITS EFFECT ON FETAL AND NEONATAL PERIOD

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ABSTRACT

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Lead exposure during pregnancy is a critical public health issue. Major sources include water, food, air, dust, and soil, with placental and breast milk transmission affecting the fetus and newborn. Lead accumulates in the body, making even small exposures relevant over time.

We studied maternal blood lead levels and their impact on fetal and neonatal outcomes. While no strong correlation was found with anthropometric data, Apgar scores—particularly at 1 minute—were significantly affected. Girls born before 37 weeks were more sensitive, suggesting sex-specific vulnerability to prenatal lead exposure.

We also assessed fetal blood ferritin levels, finding an inverse relationship between ferritin and maternal lead exposure in females, which correlated with lower Apgar scores. This highlights iron's role in the toxicodynamics of chronic lead exposure.

Hematologic indices in NICU patients (RBC, HGB, MCV, MCH, MCHC, MPV) showed a significant correlation between maternal lead and MCHC. The mean blood lead level (5.23 µg/dL) slightly exceeded CDC's threshold. A relationship with intrauterine growth retardation was also found, possibly due to placental dysfunction.

Practical Recommendations:

- 1) Begin monitoring lead and iron levels during preconception.
- 2) Study placental health during pregnancy.
- 3) Account for fetal sex and gestational age in clinical risk assessment.
- 4) Use delayed cord clamping in exposed infants.
- 5) Monitor blood indices in neonates born to mothers with ≥ 5 µg/dL lead.

References

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2. Smith J, et al. Lead and Neonatal Ferritin Levels. J. Neonatal Health, 2022.

