

Mercury Exposure: Impact on Birth Outcomes in Suriname

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Background

Small-scale gold-mining operations in Suriname use mercury (Hg) for gold extraction. Exposure during pregnancy can negatively influence birth outcomes and neurodevelopment. The Caribbean Consortium for Research in Environmental and Occupational Health is assessing exposure to metals in 1000 mother/child dyads. This study evaluates the association between Hg exposure in pregnant women and birth outcomes.

Methods

Hair samples were analysed for total Hg and associated with birth outcomes collected from parturition books and clinical records. Adverse birth outcomes included stillbirths, congenital anomalies, low APGAR score at 5 minutes (<7), low birth weight (<2500g), and preterm birth (<37 weeks). Logistic regression analysis was used to determine the association between hair Hg levels (high Hg was defined as exceeding the 1.1 µg/g USEPA action level) and adverse birth outcomes.

Results

Preliminary data showed a median [Hg] in hair of 246 women was 0.64 µg/g (range < LOD-6.86 µg/g; IQR 0.39-1.07), 60 women (24.4%) exceeded 1.1 µg/g. In multivariable logistic regression analysis women with lower secondary education or less had a high [Hg] compared to women with higher secondary education and up (OR 2.84; 95%CI 1.50-5.39; p=0.001). Women of Asian descent had an [Hg] comparable to those of African descent (p=0.096). Overall 24.1% of women had adverse birth outcomes, 28.3% in women with high [Hg] vs. 25.3% with low [Hg] (p=0.638).

Conclusion

One out of 4 pregnant women in Suriname had hair Hg concentrations that exceeded the USEPA action level. Adverse birth outcomes were not influenced by high Hg levels. Remarkably, lower educated women showed high Hg levels, warranting further investigation. This dataset was mainly limited to women from Suriname's coastal area. Including more women from the interior, who are expected to be more severely exposed, may alter the effect of Hg on birth outcomes.

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