

ABSTRACT

Assessment of Prenatal Exposure to Mercury using Placenta: Implications for Maternal Fish Consumption in the Caribbean

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During pregnancy a fetus may be exposed to various essential and toxic elements as a result of maternal dietary practices. In this thesis, the human placenta was selected as a biomarker to investigate prenatal exposure to these elements. The objective of this research was to investigate the impact of maternal fish intake on placental mercury concentrations for participants from three different populations.

Ethical approval was granted to collect placenta samples from participants at the University Hospital of the West Indies (UHWI)-Jamaica, during November 2012 and Mandeville Regional hospital (MRH)-Jamaica, during July 2014 and the Mount Hope Women's Hospital (MHWH) in Trinidad & Tobago during June 2015. The participants were interviewed on their fish intake and other possible sources of mercury exposure. Maternal residence and neonatal anthropometric data were also recorded. Several analytical techniques were used to determine elements concentration in the placenta.

The mean placental mercury concentrations in Jamaica and Trinidad & Tobago were 0.57 ± 0.5 µg/kg and 1.2 ± 1.0 µg/kg, respectively. The most significant factor for mercury exposure was mainly due to the types of fish consumed by participants in both countries. Participants in Trinidad & Tobago regularly ate large pelagic fish, while those in Jamaica regularly ate reef finfish. It was also found that higher placenta mercury concentrations were recorded for pregnant women living in areas with high soil mercury concentrations.

The results from this study showed an influence of maternal fish intake preferences on prenatal mercury exposure and thus a recommendation for a fish consumption advisory for pregnant women is necessary for public health purposes.

Keywords: Phylicia Ricketts; placenta; mercury.