Hair mercury levels and prenatal depression among pregnant women in multi-ethnic Suriname: preliminary results from the CCREOH- MekiTamara study

A.R. Gokoel1,2, C.W.R. Zijlmans1,2,3, M.S. MacDonald-Ottevanger1, M.Y. Lichtveld3, E.W. Harville3.

1Research Center Academic Hospital Paramaribo, Paramaribo, Suriname, 2Faculty of Medical Sciences, Anton de Kom University of Suriname, Paramaribo, Suriname, 3Tulane University School of Public Health and Tropical Medicine, New Orleans, USA

Background: Pregnant women that are exposed to high levels of mercury may have an increased risk of adverse mental health conditions including post-partum depression. Mercury use for artisanal gold mining purposes in the interior of Suriname is alarming. The Caribbean Consortium for Research in Environmental and Occupational Health (CCREOH)-MekiTamara study assesses the influence of chemical and non-chemical stressors on 1000 mother/child dyads. This study aims to determine the association of mercury exposure and depression in Surinamese pregnant women.

Method: Data of 337 pregnant women from the CCREOH program were analysed to assess probable prenatal depression using the standardized Edinburgh Postnatal Depression Scale (EPDS cut off ≥12). Total mercury in hair was measured using cold-vapor atomic absorption spectrometry (USEPA action level ≥ 1.1 ug/g indicated elevated mercury levels). The association between hair mercury levels and depression was examined using logistic regression analyses, adjusted for demographic factors.

Results: 92 women (27.3%) had elevated total mercury hair levels that exceeded the USEPA action level, 24.8% of this sub-cohort had probable depression; no significant association was observed between elevated mercury levels and probable depression. 25.9% of women with elevated mercury levels had probable depression versus 24.3% without elevated mercury levels. Bivariate analyses indicated women 35 years or older had 3.06 the odds of elevated mercury levels (p=0.003) compared to women 20-34 years. Women with elevated mercury levels were more often lower educated (OR 2.50, p<0.001) and were living in the interior of Suriname (OR 5.97, p=0.01), ethnicity and income were not associated.

Conclusion: One out of 4 pregnant Surinamese women in the CCREOH sub-cohort had elevated hair mercury levels. Older women, women with lower education and those living in areas of high exposure were at higher risk. Hair mercury levels did not show a significant association with depression.

Funding: This work is supported by the NIH Fogarty International Center (grant numbers U01TW010087 and U2RTW010104).