

胎盤與臍帶血汞濃度之相關研究

Determination of mercury concentrations in placenta and cord blood of mother and their newborns

中文摘要

胎兒在子宮內發育的期間，被認為是人一生當中對汞的感受性最強的時候，因此孕婦懷孕期間汞的暴露，可能會導致胎兒神經、腎、腦部傷害，也會造成胎兒神經發育遲緩。台灣是一個魚類食用量相當高的國家，台灣的孕婦是否因此在體內累積較多的汞，至今仍無詳細資料。因此，本研究主要目的為探討國內孕婦體內血汞、臍帶血汞以及胎盤汞的濃度及影響因子，進而提供民眾遠離汞危害之參考。本篇研究對象為在台北市某醫學中心生產之 65 位孕婦。於孕婦生產前四個月內進行問卷及同意書填寫，並在生產時取得母親血液、臍帶血液以及胎盤樣本；所有樣本經過濕式消化後，使用冷蒸氣原子吸收光譜儀（Hiranuma HG-310）進行汞濃度分析。

研究結果發現：1.本研究中的 65 位都會區孕婦血汞、臍帶血汞及胎盤汞濃度分別為 9.08 ± 0.40 、 $10.03 \pm 0.55 \mu\text{g/L}$ 及 $19.24 \pm 1.75\text{ng/g}$ ，與各國文獻比較之下，有偏高的趨勢。2.U.S.EPA 認為血汞濃度超過 $5.8 \mu\text{g/L}$ 將有可能對胎兒健康產生危害，而本研究有 89% 的孕婦血汞濃度高於 $5.8 \mu\text{g/L}$ 。3.「懷孕期間應注意魚類攝取」的相關資訊並未有效的傳遞給孕婦，從問卷及危害指標的計算上皆可看出多數孕婦仍會因魚類的營養價值而在懷孕期間增加魚類的攝取。4.本研究對象懷孕前平均汞危害指標為 0.69 ± 0.12 ，懷孕期間平均汞危害指標為 0.87 ± 0.17 ；無論在懷孕前或懷孕期間皆有超過 20% 之孕婦汞危害指標大於 1。

由本研究結果可看出台灣都會區之孕婦體內汞濃度有過高之虞，因此建議相關單位對台灣地區育齡婦女血中總汞進行大規模調查，以減少其對婦女及胎兒之潛在危害。

英文摘要

It has been recognized that fetus is most accessible to mercury during development. Exposure to mercury during development might lead to damage to neuronal, kidney and brain of fetus, as well as growth retardation. Until present time, there's no information regarding to the mercury concentration accumulation in pregnant women in Taiwan, a high fish-consuming country. In order to clarify the issue, the specific aim of this study is to investigate the mercury concentration in blood of pregnant women, umbilical cord blood, placenta and related factors. Furthermore, we can provide a reference of mercury risk for the public to keep away from the possible damages.

The subjects in this study are sixty five pregnant women in a medical center in Taipei city. We performed questionnaire and agreement before the first 16 weeks of pregnancy and collected the blood samples from these mothers and umbilical cord blood and placenta after their delivery. All the blood samples were wet-digested and mercury concentrations were analyzed using cold-vapor atomic absorption spectrophotometry.

We found that (1) the mercury concentration in blood samples from these mothers and umbilical cord blood and placenta are 9.08 ± 0.40 , $10.03 \pm 0.55 \mu\text{g/L}$ and $19.24 \pm 1.75 \text{ng/g}$ respectively, which are higher in comparing to the present references. (2) 89% of the blood mercury concentration in the mothers is higher than $5.8 \mu\text{g/L}$, which is the recommend concentration of U.S. EPA. (3) According to the questionnaire and hazard index (Exposure Dose/Reference Dose) , the message of “To be careful to the fish consumption during pregnancy” is not efficiently delivered to the pregnant women. The pregnant women still increase the consumption of fish due to the nutrients needs. (4) The hazard index before pregnancy is 0.69 ± 0.12 and 0.87 ± 0.17 during pregnancy. There are 20% of the pregnant women showed the hazard index over than 1 before and during pregnancy.

Our data shows that it is needed to be concerned that the higher mercury concentration in pregnant women in Taipei city. Therefore, it is recommended that government should carry on a large scale survey to the mercury concentration in blood of pregnant women in Taiwan in order to diminish the possible damages to the mothers and fetus.

Keywords: pregnant women, blood, placenta, mercury concentration, hazard index