

摘要

二手菸含有四千餘種的成分，其中包括三十種金屬元素例如砷、鋁、銅、鐵、鋅、鎘、鉻、鉛、鎳、硒等，過去相關文獻得知孕婦在懷孕期間暴露到二手菸，這些金屬會透過胎盤對其胎兒之發育有不同程度健康之影響。

衛生署自民國 86 年 3 月 19 日正式公佈菸害防治法，國內男性勞工吸菸率一直維持 50%，其中職場亦是暴露二手菸之主要場所，因此暴露二手菸對懷孕婦女及其新生兒之健康效應尤其重要，然而目前台灣地區暴露二手菸中重金屬對其健康影響之研究較少。故本研究之目的是測量孕婦暴露二手菸其血液、胎兒臍帶血及胎盤中鉛與鎘之含量，並探討各檢體鉛與鎘之濃度與新生兒健康指標之相關性。總共收集中部某婦產科醫院共計 137 名孕婦，自產檢期間收集問卷並在其生產時收集其血液、新生兒臍帶血和胎盤。各檢體中鉛與鎘以石墨式原子吸收光譜儀 (GF-AAS) 分析，所有檢體的測量均在嚴格的品質控制下執行，結果顯示孕婦血液與胎兒臍帶血鉛具統計之相關性 ($r=0.644$) 且胎盤鉛與臍血鉛亦有統計相關性 ($r=0.407$)，表示孕婦血鉛會透過胎盤傳輸到胎兒；且孕婦血中鎘與胎盤鎘亦有高度相關，而臍血鎘與胎盤鎘則無，可知鎘金屬易蓄積在胎盤不易傳輸到胎兒，胎盤對鎘具有阻隔作用。母血鉛值愈高其新生兒體重及懷孕週數

有減少的趨勢，但不具統計上顯著差異。

本研究除可建立國內孕婦在家庭、工作場所及公共場所二手菸之暴露外，並與國外文獻資料相比較，除瞭解國內自民國 86 年以後實施菸害防治法之成效，對台灣地區建立二手菸資料有所助益外，亦可作為衛生及環保機關推展菸害防治之參考，降低對懷孕婦女及新生兒的危害，以確保國人健康水準及提昇環境之品質。

關鍵詞：二手菸、懷孕婦女、新生兒臍帶血、胎盤、鉛、鎘、新生兒健康指標

Abstract

Environmental tobacco smoke (ETS) contains over 4000 compounds, including numerous heavy metals, such as lead, cadmium, arsenic and chromium. These heavy metals pass through placental blood for the fetus and cause developmental problems for newborn. In 1997, the Tobacco Act prohibited smoking in public indoor places throughout Taiwan. Half of Taiwanese male workers had consumption of cigarette smoking, it is important to understand the health effects of ETS on pregnant women and the newborn. However, there have been few studies on the health effects of heavy metals from ETS.

The objective of this study is to measure lead and cadmium levels in the blood of pregnant women, cord blood and placenta, and to correlate them with ETS levels. Participants were collected from an obstetrics and gynecology hospital in central Taiwan. All specimens of lead and cadmium will be analyzed by atomic absorption spectrophotometer/graphite furnace (GF-AAS). Strict quality control was performed for all measurements. Our results show significant correlations of lead level between the maternal blood and cord blood ($r=0.644$) in the placenta and cord blood ($r=0.407$) . It indicated blood lead passed through placenta to the fetus. A significant correlation of cadmium level was found between the maternal blood and placenta but cord blood but not found in placenta. Our finding was consistent with previous studies which cadmium accumulated easily in placenta. The maternal blood lead was not significant correlation with birth weight and gestation period

Levels of lead and cadmium in cord blood samples are compared to those reported in previous studies. Blood lead levels will be compared pre- and post-treatment of using lead-free gasoline in Taiwan to understand the impact on the healths of pregnant women and the newborn. Our finding can take as reference for governmental regulations to reduce the levels of ETS in public building and alleviate the harmful effects done to pregnant women and newborns.

Keywords: Environmental tobacco smoke (ETS), pregnant women, cord blood, placenta, lead, cadmium, newborn health index