

## Possible Influence of Elemental Mercury in Pregnancy

MLADEN KRŠNIK<sup>1</sup>, MARIJA PREZEL<sup>1</sup>, JOSKO OSREDKAR<sup>1</sup>, ALENKA SESEK-BRISKI<sup>1</sup>, ALFRED B. KOBAL<sup>1</sup>, CRT KNAP<sup>2</sup>, MILENA HORVAT<sup>3</sup> & DARIJA GIBICAR<sup>3</sup>

<sup>1</sup>Clinical Institute of Clinical Chemistry and Biochemistry, Njegoseva 4, 1525, Ljubljana, Slovenia, e-mail: mladen.kršnik@kclj.si

<sup>2</sup>Department of Occupational Medicine Idrija Mercury Mine, O. Zupancic 3, 5280, Idrija, Slovenia

<sup>3</sup>Jožef Stefan Institute: Department of Environmental Sciences, Ljubljana, Slovenia  
E-mail: milena.horvat@ijs.si, darija.gibicar@ijs.si

**Abstract:** Until now not many investigations of a possible influence of elemental mercury (Hg<sup>0</sup>) on pregnant women and their newborn children have been made. The purpose of the present work was to observe changes of mercury in whole blood (B-Hg) and urine, superoxide dismutase (SOD), glutathione peroxidase (GPx) and catalase (CAT) in erythrocytes, selenium in whole blood (B-Se), plasma (P-Se) and urine (U-Se) during pregnancy, and to evaluate the relationship between mother and child.

The study included 11 pregnant women living in the area of Idrija Mercury Mine Idrija and seven pregnant women as a control group. After cessation of Idrija Mercury Mine activity in 1994, the air mercury concentration in the town has been significantly decreased. In the last 8 years the average concentration of elemental mercury in Idrija has been between 30 and 170 ng/m<sup>3</sup>. The blood and urine samples from mothers were taken in the first and last trimester and the cord blood was taken at the time of birth.

The main conclusions indicate that (1) the Hg concentrations in blood and urine in the exposed group were not significantly higher than those in the control group; (2) the mean SOD activity from the exposed pregnant women was significantly higher than that of the control group ( $p < 0,01$ ); (3) the mean B-Se concentration, GPx activity were lower, CAT and SOD activities were higher in the 3rd trimester of pregnancy than in the 1st trimester, but only P-Se concentration was significantly lower ( $p < 0,001$ ); (4) significant differences in SOD activity ( $p < 0,01$ ) and P-Se ( $p < 0,01$ ) concentration were found between the 1st trimester of pregnancy and the cord blood samples in both groups, whereas no significant difference was found between 3rd trimester of pregnancy and cord blood samples, except in the control group, where P-Se concentrations were significantly lower ( $p < 0,02$ ) and SOD activities were higher ( $p < 0,02$ ); (5) the following correlations during pregnancy in the exposed group were observed: U-Se and P-Se ( $-0,471$ ;  $p < 0,03$ ), and between B-Se and B-Hg ( $0,818$ ;  $p < 0,05$ ) in cord blood samples. The results of B-Se, P-Se and GPx are in the accordance with the results represented by Zachara et al. (1993), where decreasing of these parameters showed increased requirement for the element during pregnancy. SOD, probably demonstrates an increased activity to the oxygen radical production due to the long-term background higher exposure to Hg<sup>0</sup> although no significant increase of actual Hg has been noted during pregnancy or in cord blood in the both groups. Therefore, further studies are needed.

**Key words:** mercury, Selenium, pregnancy, antioxidant enzymes