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Evaluation of the effect of maternal smoking on steroid hormone levels in placenta using metabolomic approach

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The cigarette smoking habit during pregnancy and exposure to environmental tobacco smoke (ETS) pose a threat to health of both the fetus and the mother and thus, the effects of smoking have to be closely monitored. Various methods have been developed to estimate the degree of active and passive human exposure to tobacco smoke and these have been applied to different body fluids and tissues. The placenta is of particular interest in the studies as its major role is to transport molecules between the mother and the child. Due to these properties the constituents of cigarette smoke (CS) can be freely transported through the placental barrier and reach the fetus. Moreover, the placenta is also responsible for the synthesis of many hormones which exert influence on the ovaries, uterus and developing child. Steroid hormones are especially important as they play a critical role in the progression of pregnancy, fetal survival and its development.

The knowledge about the effect of maternal cigarette smoking on steroid hormones produced by placenta is still limited and most studies concentrate only on the influence of CS on progesterone synthesis. Therefore, the present study was designed to apply HPLC-Corona CAD analysis to determine the levels of steroid hormones in placenta samples obtained from active and passive smokers and evaluate the alterations in chemical pathways of the compounds caused by CS. The application of metabolomic approach enabled to analyze the differences in steroid profiles of non-smoking and smoking mothers and indicated that smoking decreases the production of steroid hormones responsible for maintaining pregnancy and promoting fetus development.

Biography

Alicja Kottowska has completed her PhD at the age of 31 years from Faculty of Chemistry, University of Gdańsk, Poland and is currently working at Faculty of Pharmacy, Medical University of Gdańsk, Poland. Her major research interests lie in the field of the application of various chromatographic and multivariate techniques enabling the selection of potential biomarkers of exposure as well as endocrine disorders. She has published several IF papers on steroid hormone metabolomics and has been serving as a reviewer for numerous bioanalytical journals.

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