J Environ Anal Toxicol 2018, Volume 8
DOI: 10.4172/2161-0525-C3-018

Polycyclic aromatic hydrocarbons in placenta of Indian women and their influence on gestational age

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As ubiquitous in nature, polycyclic aromatic hydrocarbons (PAHs) receive attention because of their possible role in implicating adverse pregnancy outcomes including preterm birth, reduced birth weight and intrauterine growth restriction. In this study, the association of PAHs exposure with preterm birth was explored by collecting the placental tissue samples after delivery from 84 healthy non-smoking pregnant women. Then PAHs were extracted from samples followed by quantification with the help of gas chromatography equipped with an FID detector (GC-FID). A detailed questionnaire and medical records of pregnant women were also included in the study. Levels of PAHs were compared between two groups, one group with women having gestational age≥37 weeks known as a control group and the second group having a gestational age < 37 weeks serve as the study group. For most PAHs, higher, but statistically insignificant levels were found in the study group than the control except for acenaphthene, fluorene, acenaphthylene, phenanthrene, benzo(a)anthracene and chrysene. However, significantly higher level of benzo (a) pyrene was found in the preterm delivery group (0.485±0.675 ppb) than full-term delivery group (0.124±0.436 ppb). The association between PAHs and gestational age was drawn with the help of a linear regression model. Values of the Pearson correlation coefficient clearly shown the significant correlation ($P<0.05$) of benzo (a) pyrene ($r=-0.293$) and anthracene ($r=-0.264$) for the depletion trend of gestational age. Also, the standardized PAHs effect was little higher for benzo (a) pyrene ($\beta=-0.549$, $P<0.001$) than that attributed to anthracene ($\beta=-0.303$, $P<0.05$). This finding suggests the possible role of an environmental pollutant like PAHs for inducing early delivery in women.

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