

## Air Pollutants Exposure and Blood High Sensitivity C-Reactive Protein Concentrations in Healthy Pregnant Women

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**Abstract :** Air pollutant exposure results in elevated concentrations of oxidative stress and inflammatory biomarkers in general populations. Increased concentrations of inflammatory biomarkers in pregnant women would be associated with preterm labor and low birth weight. To our best knowledge, the associations between air pollutants exposure and inflammation in pregnant women and fetuses are unknown, as well as their effects on fetal growth. This study aimed to evaluate the influences of outdoor air pollutants in northern Taiwan areas on the inflammatory biomarker (high sensitivity C-reactive protein, hs-CRP) concentration in the blood of healthy pregnant women and how the biomarker impacts fetal growth. In this study, 38 healthy pregnant women who are in their first trimester and live in northern Taiwan area were recruited from the Taipei Chang Gung Memorial Hospital. Personal characteristics and prenatal examination data (e.g., blood pressure) were obtained from recruited subjects. The concentrations of inflammatory mediators, hs-CRP, in the blood of healthy pregnant women were analyzed. Additionally, hourly data of air pollutants (PM10, SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, CO) concentrations were obtained from air quality monitoring stations in Taipei area, established by the Taiwan Environmental Protection Administration. The definition of lag 0 and lag 01 are the exposure to air pollutants on the day of blood withdrawal, and the average exposure to air pollutants one day before and on the day of blood withdrawal, respectively. The statistical analyses were conducted using SPSS software version 22.0 (SPSS, Inc., Chicago, IL, USA). This analytical result indicates that the healthy pregnant women aged between 28 and 42 years old. The body mass index before pregnancy averaged 21.51 (sd = 2.51) kg/m<sup>2</sup>. Around 90% of the pregnant women had never smoking habit, and 28.95% of them had allergic diseases. Approximately around 84% and 5.26% of the pregnant women worked at indoor and outdoor environments, respectively. The mean hematocrit level of the pregnant women was 37.10%, and the hemoglobin levels were ranged between 10.1 and 14.7 g/dL with 12.47 g/dL of mean value. The blood hs-CRP concentrations of healthy pregnant women in the first trimester ranged between 0.32 and 32.5 mg/L with 2.83 (sd = 5.69) mg/L of mean value. The blood hs-CRP concentrations were positively associated with ozone concentrations at lag 0-14 ( $r = 0.481$ ,  $p = 0.017$ ) in healthy pregnant women. Significant lag effects were identified in ozone at lag 0-14 with a positive excess concentration of blood hs-CRP.

**Keywords :** air pollutant, hs-CRP, pregnant woman, ozone, first trimester

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