

ASSOCIATIONS BETWEEN METEOROLOGICAL FACTORS AND OUTDOOR AIR-POLLUTION IN EACH TRIMESTER WITH ADVERSE BIRTH OUTCOME: 10 YEARS DAILY BIRTHS RECORDS TIME SERIES ANALYSIS

Michael, Friger *Ben-Gurion University of the Negev, Israel*
Zinovy Shraga, *Ben-Gurion University of the Negev, Israel*
Relly HersHKovitz, *Soroka University Medical Center, Israel*

Background and Aims: Small for gestational age (SGA) and preterm birth (PTB) are important causes of infant mortality, neonatal, peritoneal, childhood and long-term adult morbidity. There exist epidemiological evidences that environmental factors affect these birth outcomes and their impact in each pregnancy phase is different. However, knowledge about these effects is insufficient and contradictory. This study aimed to assess the association between meteorological and air-pollution factors in each of pregnancy trimester with SGA and PTB.

Methods: The data includes all daily birth records for August 1999 – February 2010 registered at a medical center serving the entire population of Southern Israel. Dependent variables were defined as daily counts of SGA and PTB. Daily total birth count was used as offset variable. Meteorological variables list included daily measurements of temperature, relative humidity, solar radiation and wind velocity. Air-pollution variables list included particular matters PM10, total nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO) and ozone (O₃). Natural cycles based on annual and weekly cycles are considered in trigonometric form. GLM Poisson models based on special time series technique with independent variables lagged for each pregnancy trimester were used for assessment of above named associations.

Results: The mean daily temperature and humidity range were associated with SGA and PTB rates. The daily solar radiation negative associated with SGA and PTB rates. Exposure to NO_x, CO, O₃ were associated with SGA rates, and exposure to SO₂, CO, O₃ was associated with PTB rates.

Conclusions: Air-pollution and changes in weather are statistically significant associated with adverse birth outcomes in each pregnancy trimester. The possible air-pollution effect is combined and synergistic and influence of environmental exposure on SGA and PTB rates is different in each trimester. Our findings suggest the highest impact of environmental exposure during the third pregnancy trimester on considered births outcomes.