

THE EFFECT OF PM₁₀ EXPOSURE ON MORTALITY BY THE TIME OF DEATH

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Background: Many studies have established PM₁₀ effects on mortality. However, it is not clear that the relationship between the time of death and PM₁₀ exposure. We focused on the relationship between the time of death and PM₁₀ exposure in Seoul, Korea.

Data and Methods: We employed a temperature matched case-crossover design. Mortality data (except accidental death) from the Korean National Statistics Office consisted of records for Seoul, Korea for 2008, and included individual characteristics such as age, address, cause of death and time of death etc. A total of 33,728 deaths were identified, including 8,693 and 1,816 for cardiovascular and respiratory mortality, respectively. Stationary monitoring data of PM₁₀ at the 25 sites in Seoul was analyzed together with weather data and hourly data of PM₁₀ was acquired.

We divided a day into 3 time groups by subject's time of death followed as: Morning time (1 a.m. to 8 a.m.), Day time (9 a.m. to 4 p.m.), Night time (5 p.m. to midnight).

Result: We found that the associations between PM₁₀ and mortality were significant during the morning and day time after 24 hours of lag, but not significant during the night time. During the study period, 10ug/m³ increase in PM₁₀ with the lag of 24 hour was associated with the increases in morning and day time mortality by 1%(95% CI : 1.002, 1.017), 0.8%(1.001, 1.014), respectively for total mortality, 1%(1.001, 1.031), 1%(1.000,1.028), respectively, for cardiovascular mortality.

Conclusion: The effect of PM₁₀ exposure with lag of 24 hour on mortality was different by the time of death. Especially, the effect of PM₁₀ on mortality was positively associated for the subjects who died in the morning and during the day. However, the subjects who died at night time showed less association with PM₁₀ than other subjects who died between 1 a.m. and 4 p.m.