

# ASSOCIATIONS BETWEEN OZONE EXPOSURE AND DYSFUNCTION OF CARDIAC AUTONOMIC NERVOUS SYSTEM IN HEALTHY ELDERLY SUBJECTS

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**Background and Aims:** Previous studies have provided strong evidences that elevated levels of ambient ozone (O<sub>3</sub>) are associated with the increased cardiovascular mortality and morbidity. The dysfunction of cardiac autonomic nervous system (ANS), indicated by the disturbed heart rate variability (HRV) indices, is the major contributor to the triggering of electro-physiologic diseases. Heterogeneous associations between O<sub>3</sub> exposures within several hours and HRV in subjects with compromised health status are reported in some previous studies. No studies, however, have focused on the effect of several minutes O<sub>3</sub> exposure on healthy elderly subjects.

**Methods:** Real time ambient O<sub>3</sub> concentration and HRV indices of 20 healthy elderly subjects were measured continuously and concurrently by 5-min segment in winter, Beijing. Mixed linear model was used to evaluate the associations between ambient 5-min average O<sub>3</sub> and concurrent 5-min HRV frequency indices adjusting for the time-variant variables (temperature and relative humidity) and subject characteristics.

**Results:** Elevated ambient O<sub>3</sub> exposure was associated with decreased High Frequency (HF) ( $\bullet = -0.00213$ ,  $p=0.024$ ) and increased low-frequency/high-frequency ratio (LFHFR) ( $\bullet = 0.00177$ ,  $p=0.016$ ) in healthy elderly subjects.

**Conclusions:** We conclude that ambient O<sub>3</sub> exposures within several minutes may exert predominance of cardiac sympathetic nervous activity, which may increase the risk for acute cardiac events.