

Effects of concentrated ambient particles on heart rate variability in spontaneously hypertensive rats.

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摘要

Abstract

In the present study, the cardiovascular toxicity of PM(2.5) was determined in spontaneously hypertensive (SH) rats using the standard deviation of normal-to-normal intervals (SDNN) and root mean square of successive differences of adjacent normal-to-normal intervals (RMSSD) as outcome measurements. Four SH rats implanted with radiotelemetry transmitters were repeatedly exposed to concentrated PM(2.5) in nose-only exposure chambers. Gravimetric analysis revealed the mean post-concentrating mass concentration of particles during the 5 h of exposure was 202 $\mu\text{g}/\text{m}^3$. Using each animal as its own control and linear mixed-effects model, to adjust for circadian nature and individual differences, we found that SDNN decreased by 15% initially then gradually decreased to 60% of the initial value at the end of exposure. Our results indicate that concentrated PM(2.5) may decrease SDNN on SH rats during PM exposure. The study also showed that SDNN is more sensitive to PM induced effects than RMSSD.