**Exercise in Inversions: PM2.5 Air Pollution Effects on Pulmonary Function and Aerobic Performance**

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Wintertime thermal inversions occurring in geographical regions confined by mountains have the potential to trap air pollutants, leading to the accumulation of small particulate matter (PM2.5). Despite an association between respiratory hospital admissions and elevated PM2.5 levels, many people continue to exercise outdoors during inversions. **Objective**: The study aim was to compare pulmonary function and exercise performance during periods of low and high ambient PM2.5 concentrations. **Methods**: Forced vital capacity (FVC) and forced expiratory volume in 1 sec (FEV1) were measured outdoors before and after two running time trials of 3200 m. One run was performed with low PM2.5 concentration (< 12.0 µg/m3), and the other trial was conducted during “yellow” or “orange” air quality alert days (PM2.5 ≥ 12.0 µg/m3). Additionally, a 10 cm visual analog scale (VAS) administered post-exercise was used to quantify subjective ratings of respiratory discomfort during the run. **Results**: The PM2.5 differential between trials was ≥ 18 µg/m3 for 10 volunteers. Despite feeling significantly more respiratory discomfort during the bad air trial (VAS: 2.9 ± 1.8 vs 4.6 ± 1.8 cm; *p* = 0.044), the differences in 3200 m run time (834.4 ± 94.4 vs. 847.4 ± 104.0 sec; *p* = 0.261) and immediate post-exercise heart rate (188.4 ± 8.1 vs. 186.0 ± 7.4 bpm; *p* = 0.328) were not significant between trials. Furthermore, the difference in post-exercise FVC was not significantly different (*p* = 0.846) between the low PM2.5 (4.86 ± 1.00 L) and high PM2.5 (4.84 ± 0.95 L) conditions. Similarly, the difference in post-exercise FEV1 was not significant (*p* = 0.750) between trials (4.22 ± 0.89 L vs. 4.23 ± 0.85 L). **Conclusions**: Neither run time nor pulmonary function were adversely affected by high ambient PM2.5. These parameters might not be sensitive to the negative health consequences of acute air pollution exposure.