FINE PARTICLE AIR POLLUTION IS A POTENTIAL TRIGGER FOR STEMI BUT NOT NON-STEMI

Poster Contributions
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Session Title: Stress, Coronary Spasm and AMI: Lessons from Japan, New Orleans, Greece
Abstract Category: 1.Acute Coronary Syndromes: Clinical
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Background: Increased risks of acute cardiovascular events have previously been associated with acute increases in ambient fine particulate matter (PM2.5; particles with an aerodynamic diameter < 2.5 µm) concentrations. Previously, we reported an increased risk of transmural myocardial infarction (MI), but not non-transmural MI, associated with increased PM2.5 concentrations. We evaluated whether increases in PM2.5 in the previous few hours and days were associated with increased risks of ST segment elevation myocardial infarction (STEMI) and separately, non-ST segment elevation myocardial infarction (NSTEMI).

Methods: We retrospectively studied n=338 patients with a STEMI and n=339 patients with NSTEMI who underwent a coronary angiogram at our center from January 1, 2006 to December 31, 2010, provided estimates of symptom onset date and time, and lived within 15 miles of our air pollution monitoring site. A time-stratified case-crossover design was used to separately estimate the risk of STEMI and NSTEMI associated with increased concentrations of PM2.5 in the previous 1, 3, 6, 12, 24, 48, 72, 96, 120, 144 and 168 hours.

Results: We found the largest risk of STEMI associated with each interquartile range increase in PM2.5 concentration in the previous 1 hour (OR=1.18; 95% CI = 1.01, 1.38; p=0.04), with smaller risk estimates at longer averaging times. We found no such increased risks of NSTEMI associated with increased PM2.5 concentration at any lag time.

Conclusions: These findings need to be replicated in a larger prospective study. However, they confirm previous findings of increased risk of myocardial infarction associated with increases in PM2.5 concentrations in the previous few hours, and suggest that this PM2.5 effect on MI may be limited to STEMI. Any mechanism that would explain how increased ambient PM2.5 could trigger STEMI but not NSTEMI would have to occur on this rapid timescale.