ultra-small superparamagnetic iron oxide nanoparticles increased thrombus formation compared to baseline (27,670 ± 709 μm^2 *versus* 12,156 ± 1156 μm^2; P=0.006), and increased platelet p-selectin and CD36 expression (P<0.05 for both) at 1 hour.

Conclusions: We demonstrate that engineered nanoparticles cause platelet activation and have prothrombotic effects in healthy persons and patients with vascular disease. The clinical consequences of these findings are unknown but warrant further investigation.

Acute fine particulate matter exposure reduces heart rate variability in road maintenance workers

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Heart Rate Variability (HRV) reflects the adaptability of the heart to internal and external stimuli. Reduced HRV is a predictor of post-infarction mortality. We previously found in road maintenance workers HRV increases several hours after exposure to fine particulate matter ($PM_{2.5}$), interpreted as a recovery response.

Here we assessed the within-an-hour effects of $PM_{2.5}$-exposure onto HRV in the same population. On five non-consecutive days, workers carried nephelometers providing 1-minute-interval $PM_{2.5}$-exposure. Five-minute HRV-intervals (SDNN and PNN50) were extracted from 24-hour electrocardiograms. Analyses were done for time at work, at home and during the night. Following 60 minutes $PM_{2.5}$ exposure intervals, the changes in HRV-parameters were assessed during 120 minute intervals visually and by moving average method accounting for autocorrelation.

Correlation analysis showed a significant association of decreasing SDNN and PNN50 with increasing $PM_{2.5}$-exposure. When stratifying for daytime, most associations remained significant. Short-term $PM_{2.5}$-exposure was followed by reduced HRV. This may pose a health risk in particular to people having pre-existing cardiovascular risk factors such as previous infarction or arrhythmic disorders. The role that ultrafine particles play in this response will need to be assessed in future analyses.