

Publication

Particulate matter and subclinical atherosclerosis : associations between different particle sizes and sources with carotid intima-media thickness in the SAPALDIA study

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Author(s) Aguilera, Inmaculada; Dratva, Julia; Caviezel, Seraina; Burdet, Luc; de Groot, Eric; Ducret-Stich, Regina E.; Eeftens, Marloes; Keidel, Dirk; Meier, Reto; Perez, Laura; Rothe, Thomas; Schaffner, Emmanuel; Schmit-Trucksäss, Arno; Tsai, Ming-Yi; Schindler, Christian; Künzli, Nino; Probst-Hensch, Nicole

Author(s) at UniBasel [Künzli, Nino](#) ; [Schindler, Christian](#) ; [Probst Hensch, Nicole](#) ; [Eeftens, Marloes](#) ; [Dratva, Julia](#) ; [Perez, Laura](#) ; [Tsai, Ming-Yi](#) ; [Schaffner, Emmanuel](#) ; [Keidel, Dirk](#) ; [Ducret-Stich, Regina](#) ; [Caviezel, Seraina](#) ;

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Subclinical atherosclerosis has been associated with long-term exposure to particulate matter (PM), but the relevance of particle size and sources of exposure remains unclear.; We investigated the association of long-term exposure to PM₁₀ ($\leq 10 \mu\text{m}$), PM_{2.5} ($\leq 2.5 \mu\text{m}$: total mass, vehicular, and crustal sources), and ultrafine particles [UFP $<0.1 \mu\text{m}$: particle number concentration (PNC) and lung-deposited surface area (LDSA)] with carotid intima-media thickness (CIMT).; We used data from 1,503 participants ≥ 50 years old who participated in the third examination of the Swiss SAPALDIA cohort. Exposures were obtained from dispersion models and land-use regression models. Covariate information, including previous cardiovascular risk factors, was obtained from the second and third SAPALDIA examinations.; The adjusted percent difference in CIMT associated with an exposure contrast between the 10th and 90th percentile was 1.58% (95% CI: -0.30, 3.47%) for PM₁₀, 2.10% (95% CI: 0.04, 4.16%) for PM_{2.5}, 1.67% (95% CI: -0.13, 3.48%) for the vehicular source of PM_{2.5}, -0.58% (95% CI: -3.95, 2.79%) for the crustal source of PM_{2.5}, 2.06% (95% CI: 0.03, 4.10%) for PNC, and 2.32% (95% CI: 0.23, 4.40%) for LDSA. Stronger associations were observed among diabetics, subjects with low-educational level, and those at higher cardiovascular risk.; CIMT was associated with exposure to PM₁₀, PM_{2.5}, and UFP. The PM_{2.5} source-specific analysis showed a positive association for the vehicular source but not for the crustal source. Although the effects of PNC and LDSA were similar in magnitude, two-pollutant and residual-based models suggested that LDSA may be a better marker for the health relevance of UFP. Citation: Aguilera I, Dratva J, Caviezel S, Burdet L, de Groot E, Ducret-Stich RE, Eeftens M, Keidel D, Meier R, Perez L, Rothe T, Schaffner E, Schmit-Trucksäss A, Tsai MY, Schindler C, Künzli N, Probst-Hensch N. 2016. Particulate matter and subclinical atherosclerosis: associations between different particle sizes and sources with carotid intima-media thickness in the SAPALDIA study. Environ Health Perspect 124:1700-1706;://dx.doi.org/10.1289/EHP161.

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