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TITLE: EFFECT OF INHALED ULTRAFINE CARBON PARTICLES ON THE ALLERGIC AIRWAY RESPONSE IN RAGWEED-SENSITIZED DOGS.

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**ABSTRACT:** Episodic increases in air pollution have been associated with the exacerbation of asthma symptoms. Ultrafine particles are a component of air pollution and may be involved in causing the adverse health effects associated with high air pollution. We evaluated the effects of ultrafine particle inhalation on immune and airway responses in a beagle dog model of allergic asthma. Six allergic (ragweed sensitive) and six nonallergic dogs were exposed to ultrafine carbon particles (232.3 +/- 2.5 microg/m<sup>3</sup>, 35.2 +/- 0.3 nm) for 1 h, followed by a challenge with vehicle (water) as a negative control. Airway resistance was measured during particle exposure and after vehicle challenge. Immune responses 3 days before and after (1 h and 1, 4, 7, and 11 days) particle exposure were assessed by measuring total immunoglobulin E (IgE) and ragweed-specific IgE and IgG in serum and bronchoalveolar lavage fluid (BALF), and cell differentials in BALF. Each dog was exposed a second time to ultrafine carbon particles (251.4 +/- 5.3 microg/m<sup>3</sup>, 34.9 +/- 0.5 nm) for 1 h followed by a challenge with ragweed and the same measurements. Airway resistance did not change during particle exposure in any of the dogs, and ragweed-induced airway reactivity was not altered by particle exposure. Total and ragweed-specific serum IgE and total IgE in BALF were higher in allergic dogs at all time points. Particle exposure did not affect antibody levels in serum or BALF in allergic dogs. Nonallergic dogs developed specific IgG in response to multiple inhalation exposures to ragweed, but this was not associated with particle exposure. Neutrophils were elevated in BALF for all groups 1 day after particle exposure. In conclusion, despite the induction of low level inflammation in the lungs of allergic and nonallergic dogs, exposure to ultrafine carbon particles did not alter airway reactivity or immune responses.