Age-dependent pulmonary response of rats to ozone exposure.

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Abstract
The influence of age on O3 effects in the lung was studied in 8 groups of Sprague-Dawley rats: 7, 12, and 18 d of age (neonatal); 24, 30, and 45 d of age (infant); and 60 and 90 d of age (adult). Lung weight, total lung protein and DNA contents, and a series of marker enzyme activities in lung tissue were determined. After exposure of rats from each group to 0.8 ppm (1568 microgram/m3) O3 continuously for 3 d, a biphasic effect was noted. The biochemical parameters, expressed per lung, in O3-exposed rats relative to their corresponding controls decreased in the 7- and 12-d-old groups, increased or remained unchanged in the 18-d-old group, and increased in the 24- to 90-d-old groups. However, the increases were much greater for 60- to 90-d-old rats than for 24- to 30-d-old rats. The increase in lung biochemical parameters is thought to occur in response to lung injury and subsequent repair processes, and greater increases in the lungs of older rats suggest that they are more responsive to O3 exposure than younger rats. The decrease in lung biochemical parameters and increased mortality in 7- and 24-d-old neonatal rats suggest that they are more susceptible to O3 stress than infant and adult rats.

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