

results indicate that the bronchial tree of the rat and of the human asthmatic respond comparably to a corticosteroid.

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Pulmonary mechanical changes in experimental bronchitis

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SO₂-induced pulmonary mechanical changes have been studied in the dog (Lulling, Lievens, El Sayed & Prignot, 1968). These studies have shown that the bronchitic dog responds to treatment with bronchodilator drugs such as isoprenaline, theophylline and declozine.

Since the rat is a more convenient species for laboratory study, it was decided to study the pulmonary mechanical properties of rats which had been exposed to SO₂. Male caesarean-derived rats were exposed 6 hr daily, 5 days a week for 20 weeks to an atmosphere containing SO₂ (200 p.p.m.). At the end of this period pulmonary mechanical properties were measured and histological damage assessed.

The rats were anaesthetized and the trachea cannulated. Recordings were made of respiratory flow rate and transpulmonary pressure. Integration of the flow signal provided volume information. Pulmonary compliance and resistance were calculated from the flow, pressure and volume traces (Amdur & Mead, 1958) and corrected for body weight.

The lungs were removed and fixed in buffered formalin. After staining with Mayers haemalum and eosin, periodic acid-Schiff and alcian blue the sections were assessed for histological damage (Lightowler & Williams, 1969). The pulmonary resistance of the animals exposed to SO₂ was significantly greater than that of the air control animals (from "t" test $P=0.002$). Pulmonary compliance of the rats which had been exposed to SO₂ was significantly lower than that of the air control rats (from "t" test $P=<0.05$). Pulmonary damage due to SO₂ was reflected in the total histological score. The SO₂ group had significantly higher histological scores than the air control group (from "t" test $P=<0.01$).

It is suggested that this experimental system may be of value in the assessment of drugs intended for use in chronic bronchitis.

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