

The evaluation of anaphylactic bronchoconstrictor effects induced by intravenous and aerosol challenge in the anaesthetized guinea-pig

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The degree of bronchoconstriction produced in response to antigen challenge in sensitized guinea-pigs using the recording systems of Konzett & Rössler (1940) and Dixon & Brodie (1903) has been compared by Hicks & Leach (1963). The experiment to be demonstrated uses a modification of the Dixon & Brodie constant volume system. The bronchoconstrictor response to an anaphylactic reaction is assessed by comparison of the amplitude of the record (X) at given intervals over a period of 15 min, with the maximal excursion of the recording system produced by total bronchial occlusion (Y). The degree of bronchoconstriction at each point is expressed as the percentage reduction in respiratory volume, or $100X/Y$.

The mean values and standard errors at each time interval for the group obtained are plotted graphically in Fig. 1 in terms of percentage reduction in tidal volume against time.

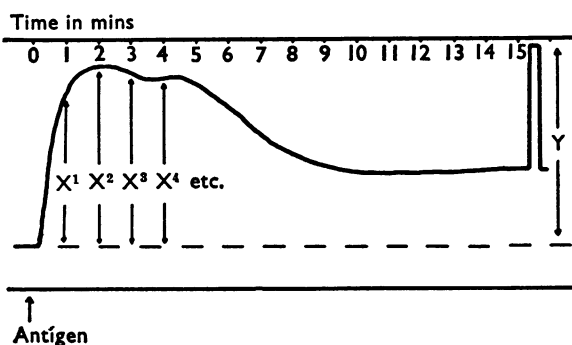


FIG. 1. Reduction in respiratory volume following intravenous antigen challenge in a sensitized guinea-pig. Y represents total bronchiolar occlusion or 100%. X 1, 2, 3, etc., the amplitude of the record at each minute after challenge.

This procedure provides a detailed analysis of the severity of different phases of the reaction. The value of quantitative comparison of such data in the investigation of the anti-anaphylactic drugs will be demonstrated.

The apparatus may be simply adapted in order to administer either antigen or antagonist as an aerosol. When the antigen is given intravenously the effects of aerosol bronchodilators administered concomitantly may be easily evaluated. Similarly, the effects of orally administered drugs may be compared for their ability to modify aerosol induced allergic bronchospasm in guinea-pigs.

REFERENCES

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