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EFFECT OF AEROSOL IPRATROPIUM BROMIDE (SCH 1000) ON SPUTUM VISCOSITY AND VOLUME IN CHRONIC BRONCHITIS

In chronic bronchitis anticholinergic drugs are more likely to produce bronchodilation than β -adrenoreceptor stimulant drugs (Poppius & Salorinne, 1973). These drugs have not found an established place in clinical practice because atropine may inhibit secretion of the bronchial glands, leading to drying of the bronchial mucous membrane (Goodman & Gilman, 1970). This may lead to an increase in the viscosity of the bronchial secretion and to an increase in airways obstruction. We report here the effect of a new anticholinergic drug which is similar to atropine, ipratropium bromide (Boehringer Ingelheim), on

sputum volume and viscosity when given by aerosol to bronchitic subjects in a controlled trial.

Twelve bronchitic in-patients were studied. They were all producing mucoid sputum and were given two puffs of ipratropium bromide (40 μg) or two puffs of an identical placebo aerosol containing propellant only, for 2 days, the order of the treatments being randomized. All sputum was collected and its volume measured for 24 h and sputum production from mid-day to 15.00 h was collected separately and the apparent viscosity measured at a shear rate of 700 s^{-1} with a Ferranti-Shirley cone and plate viscometer

Table 1 Mean changes ($\pm$ s.d.) in sputum viscosity and volume in twelve bronchitic patients given ipratropium bromide or placebo by aerosol

Sputum viscosity at 700 s ⁻¹ (centipoise)		24 h sputum volume (ml)	
Placebo	Ipratropium bromide	Placebo	Ipratropium bromide
73.0 ($\pm$ 29.6)	91.6 ($\pm$ 44.3)	34.0 ($\pm$ 20.4)	33.3 ($\pm$ 19.7)
$t=1.90$, NS		$t=0.31$, NS	

(Palmer, Ballantyne, Diament & Hamilton, 1970). The mean sputum viscosity and volume were compared for each treatment using Student's paired t -test. (Table 1).

There was no evidence from this study that aerosol ipratropium bromide significantly increased sputum viscosity or volume. Moreover, tracheobronchial clearance studies with the drug or placebo have shown no impairment of mucociliary clearance (Matthys, Müller, Konietzko & Adam, 1975). Aerosol ipratropium bromide compared with placebo has been shown to result in a significant increase in the forced expiratory volume in 1 s and specific airways conductance as measured in a body plethysmograph in asthmatics and bronchitics. Whilst salbutamol by aerosol is more effective than ipratropium in asthma it is likely that this new drug will find a useful place in the treatment of bronchitic airway obstruction (Petrie & Palmer, 1975).

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DIAZEPAM OR NITRAZEPAM? A QUESTION OF COST

Nitrazepam is more widely used than diazepam as a hypnotic. It has been shown to be more effective in a trial of psychiatric in-patients, (Bordeleau, Charland & Tetreault, 1970) but when this study was started in 1975 the two drugs had not been compared in an unselected population of in-patients in general medical wards. At that time nitrazepam was over three times more expensive to the hospital than diazepam.

Hitherto clinical trials have almost exclusively been concerned with the relative efficacy of treatments. It has frequently been considered unethical to embark on trials unless one treatment had some expectations of

being better than the other. In the trial of the type we describe the effects were expected to be similar, but the costs were known to be different. In the present financial climate cost with efficacy and safety must be considered.

Efficient clinical trials are designed to give all possible results an equal chance of occurring and to answer defined questions. Although the principles of medical decision analysis have been widely discussed (Schwartz, Gorry, Kassirer & Essig, 1975) few trial designs take account of the possible actions which will result from a given answer. Because some of these