

Fenoterol versus salbutamol nebulisation in asthma

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Summary

A double-blind crossover study was conducted in 10 stable asthmatics comparing 5 mg fenoterol with 5 mg salbutamol, both given via a Hudson nebulizer. Although both drugs caused significant bronchodilatation at the doses used, fenoterol had a significantly greater peak effect than salbutamol and its duration of action was 4 hr as opposed to 3 hr.

KEY WORDS: fenoterol, salbutamol, asthma, nebulization.

Introduction

Fenoterol is a potent β_2 -adrenergic receptor stimulant whose main advantage as a bronchodilator is that its duration of action when given as a metered dose inhaler is claimed to be longer than that of salbutamol or terbutaline—lasting up to 8 hr (Anderson, Wilkins and Jariwalla, 1979; Benjamin, 1972; Petit and Roberts, 1973; Riedel-Dibbern and Leblanc, 1972).

A nebulizer solution of fenoterol has recently become available. The purpose of this study was to compare the peak effects and duration of action of equal doses of the nebulizer solutions of fenoterol and salbutamol in stable asthmatics.

Methods

Ten patients took part in the study (4 males, mean age 50 years, range 23-75 years). Their median duration of asthma was 15 years. Nine were non-smokers. They were all in a chronic steady state and had not taken β -agonist therapy for 12 hr before the study. All were on routine salbutamol inhalers, 6 on beclomethasone and 5 were receiving oral steroids.

The study was a double-blind crossover trial with all patients inhaling either nebulized fenoterol (5 mg) or nebulized salbutamol (5 mg) in 2 ml over 20 min via a Hudson nebulizer with oxygen. Forced expiratory volume in 1 s (FEV_1) and forced vital capacity (FVC) were followed up to 8 hr. Blood pressure and pulse rate were measured at the start, and at 15 min, 1 hr and 8 hr.

All variables were examined using the analysis of variance method with Duncan's multiple range test used to examine pairs of treatment means.

Results (Figs. 1 and 2)

Both drugs produced a significant improvement from baseline values from 15 min to 4 hr for fenoterol and from 15 min to 2-3 hr for salbutamol (Figs. 1 and 2). However, on salbutamol, the FEV_1 and FVC at 7 and 8 hr were significantly lower than baseline were the FVC at 7 hr and both the FEV_1 and FVC at 8 hr on fenoterol.

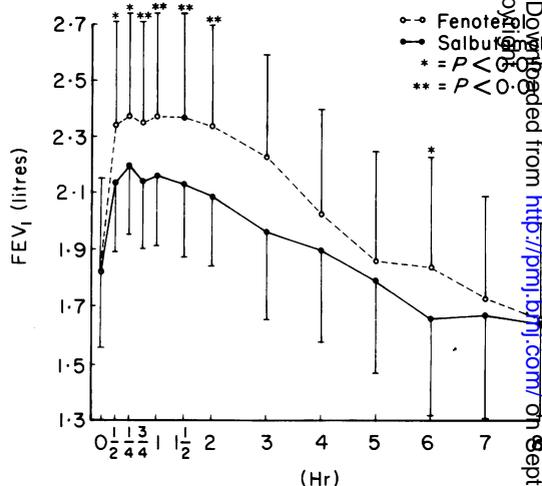


FIG. 1. The effects of nebulized salbutamol (5 mg) and fenoterol (5 mg) on FEV_1 (mean \pm s.e.) in 10 asthmatics.

Bronchodilatation was consistently better with fenoterol than with salbutamol for both FEV_1 and FVC. For FEV_1 , these differences were statistically significant for the first 3 hr and at 6 hr. For FVC, the difference in favour of fenoterol was significant at 15 min, from 1-3 hr and at 6 hr.

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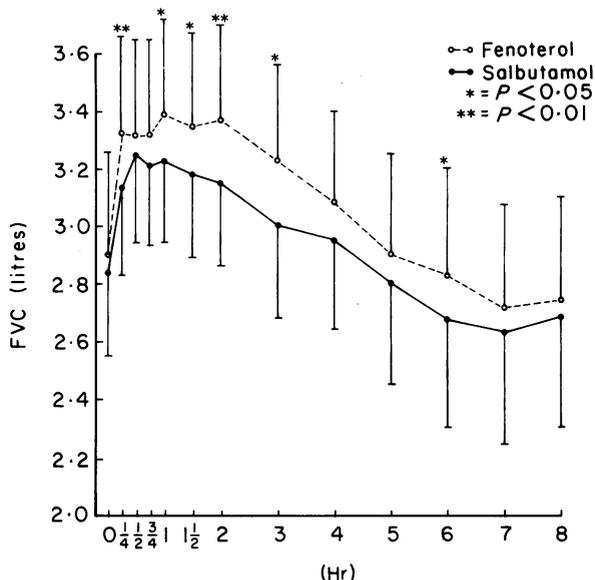


FIG. 2. The effects of nebulized salbutamol (5 mg) and fenoterol (5 mg) on FVC (mean \pm s.e.) in 10 asthmatics.

We found no significant changes in pulse rate or blood pressure, with the exception of the systolic pressure at 8 hr on salbutamol, which was raised compared with fenoterol (129 mmHg and 122 mmHg).

Four patients noted side effects, tremor (salbutamol 1, fenoterol 2), and palpitations (fenoterol 1).

Discussion

Fenoterol and salbutamol are both selective β_2 -adrenergic agonists commonly used in asthma therapy. Via metered dose inhalers, fenoterol has been claimed to have a longer duration of action (up to 8 hr) than salbutamol (Benjamin, 1972; Petit and Roberts, 1973).

In this study, comparing 5 mg of each drug (as nebulizer solutions), we have shown that fenoterol has a greater peak effect and duration of action than salbutamol. The effective duration of action of salbutamol was 3 hr and that of fenoterol 4 hr. By 8 hr, lung function had deteriorated significantly from baseline with both drugs. Another study, comparing lower doses of nebulized fenoterol with nebulized terbutaline, found them to be equipotent and confirmed a similar length of action (Carmichael, Bloomfield and Crompton, 1980). The reason as to why nebulized fenoterol should be shorter acting than fenoterol by metered dose inhaler is uncertain.

Our results suggest that nebulized fenoterol (5 mg) is superior to nebulized salbutamol (5 mg) in peak effect and duration of action. However, the overall differences between the 2 were small and the incidence of side effects was slightly greater with fenoterol. There is therefore, probably little to choose between the two drugs clinically at these doses.

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