RESEARCH PAPER

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Histological changes in small intestine and vastus lateralis of male swiss albino mice after fenoterol administration

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The protein anabolic and hypertrophic effects of fenoterol in skeletal and smooth muscles have been confirmed from an increase in tissue mass following drug administration. Based upon anabolic properties, β-agonists have been proposed as valuable adjunct to the treatment of muscle wasting conditions. The aim of the study was to ascertain the effect of fenoterol on vastus lateralis and small intestine morphology. Equimolar dose of fenoterol was administred to mice for 28 days to see its effects on vastus lateralis and small intestine in order to test the hypothesis that fenoterol would produce powerful anabolic and ergogenic effects.

Key words : Beta agonist, Fenoterol, Vastuslateralis, Small intertine

INTRODUCTION

A severe loss of muscle mass is a risk factor for mortality in a number of conditions and diseased states. β- agonists cause increase in body mass and dilation of tissues.The drug fenoterol exerts its effect on skeletal muscle via $\beta_1$and β_2 adrenoceptors.It affects smooth muscle by stimulatory or inhibitory effects on structures remote from the muscle tissue and by local action on smooth muscle cell (Bourne, 1960). Most muscle tissue contain primary β_1 and β_2 receptors which when activated cause specific muscular function. Fenoterol treatment exerts its effects on skeletal and smooth muscles and stimulate muscle growth (Reeds *et al*., 1986). The drug acts as a stimulator of growth and increases mass and protein content with decrease in fat content. After drug treatment, there is significant change in the dimensions of villi during mucosal atrophy and hypertrophy. It is known that villous amplification vary with intestinal location as well as during development, experimental treatment and disease (Fisher and Parson, 1950; Boyne *et al*.,1966, Diamond *et al*., 1984). An unique observation in the histopathological preparation is myonecrosis and is characterized by peculiar anatomical changes in the nuclear morphology. Apoptosis has been found in small intestine showing loss of surface contact with neighbouring cells. It may be triggered by cellular injuries due to hyperthermia (Barry *et al*., 1990, Lennon *et al*., 1999). Damage to the muscular coat of intestine is seen after drug treatment.

MATERIALS AND METHODS

The present investigation has been carried out on skeletal muscle (Vastus lateralis) and smooth muscle (small intestine) of mice. Adult sexually mature male mice of Balb – C strain were obtained from Central Research Institute (CRI), Kasauli (H.P). These were housed in a flat bottomed polypropylene cages and were maintained in the animal house of department of Biosciences of Himachal Pradesh University under suitable hygienic conditions with 16 hours day light and temperature 24 ± 2^0C. The animals were provided feed (Hindustan Lever Ltd.) and water *ad libitum.*

The experimental animals were divided in to two groups-a) Control, b) Animals of second group were given daily oral administration of fenoterol (1.4 mg/ kg body wt.) for 28 days. Vastus lateralis and small intestine were excised immediately after sacrificing the animals. Small tissue pieces were fixed in aqueous bouin's fixative. These were washed in running tap water till excess of picric acid got washed away, dehydrated, cleared in xylene and embedded in paraffin wax. 5 µ thin sections were cut on a rotary microtome and subjected to haematoxylin-eosin staining.

Haematoxylin-eosin staining :

Ribbons of tissue sections were cut and stretched on albuminised slides. These were subjected to dewaxing at 37^0C overnight and hydrated by passing in descending grades of alcohol 100% to30% (30 min each) and then finally in the distilled water. After that, slides were subjected to dehydration in ascending grades of alcohol (30-90%) for 30 min each. After that sections were stained in Haematoxylin stain for 30 minutes. A dip was done in acid water and alkali water for 1 minute. Counterstaining was done in 2% alcoholic eosin for 2