THE ANTIHISTAMINIC EFFECT OF BETA-ADRENOCEPTOR STIMULATING AGENTS

ABSTRACT

From the chemical structures studies of β-adrenoceptor stimulating agents and anti-H_1 agents, it was found that their main structures were similar,i.e. each mainly consisted of ethylamine side chain. Besides the β-agonists could treat asthma and chronic urticaria more effectively than antihistamine. So it was noticed that the β-agonists might have antihistaminic effect. Hence the studies on 5 β-agonists, Isoproterenol, Orciprenaline, Terbutaline, Salbutamol and Procaterol were undertaken by dividing into two parts; Part I : Biological assay and Part II : Skin test.

Part I : Biological assay comprised two experiments. The first experiment was the study on the inhibitory effect of the histamine-induced guinea-pig ileum contraction in Tyrode's solution by two concentrations of the five β-agonists. The results of the inhibitory effect expressed in the average ± S.E. of 1ug./ml. Isoproterenol, 10ug./ml. Orciprenaline, 10ug./ml. Salbutamol and 10ug./ml.Terbutaline were 72.90 ± 2.80 %, 61.27 ± 2.01 %, 48.83 ± 1.78 % and 50.02 ± 2.86 % and of 0.1ug./ml.Isoproterenol, 1ug./ml.Orciprenaline, 1ug./ml.Salbutamol, 1ug./ml.Terbutaline and 0.01ug./ml. Procaterol were 45.42 ± 4.34 %, 38.95 ± 3.78 %, 30.39 ± 3.87 %, 11.81 ± 4.03 % and 6.38 ± 2.22 % respectively. The inhibitory effect of the histamine-induced guinea-pig ileum contraction might occur by the β-stimulated intestinal relaxation accompanied with the antihistaminic activity.

The second experiment was the study on the inhibitory effect of the histamine-induced guinea-pig ileum contraction in Tyrode's + β-blocker (Propranolol) solution. The results of 1ug./ml.Isoproterenol, 10ug./ml. Orciprenaline, 10ug./ml.Salbutamol and 10ug./ml.Terbutaline were 39.49 ± 4.33 %, 28.76 ± 4.86 %, 48.32 ± 7.20 % and 24.85 ± 4.31 % ; and of 0.1ug./ml.Isoproterenol, 1ug./ml.Orciprenaline, 1ug./ml.Salbutamol, 1ug./ml.Terbutaline and 0.01ug./ml.Procaterol were 23.79 ± 4.86 %, 14.17 ± 3.29 %, 29.09 ± 4.54 % , 10.04 ± 2.34 % and 6.23 ± 1.58 % respectively. It was shown that Propranolol could completely block the intestinal relaxation. And the inhibitory effect of the histamine-induced guinea-pig ileum contraction was the result of the antihistaminic activity of the drugs. The results of the experiment could be ordered in response to their efficacy as follow Salbutamol, Isoproterenol, Orciprenaline, Terbutaline and Procaterol.

Part II : Skin test,Oral administration of 20 mg.Orciprenaline, 2.5 mg.Terbutaline, 2 mg.Salbutamol, and 50 ug.Procaterol were studied on the inhibitory effect on the wheal size induced by histamine intradermal injection. The results shown in average inhibitory percentage on the whealing reaction within 90 min. after oral administration compared to the control value,20 mg.Orciprenaline, 2 mg.Salbutamol, 2.5 mg.Terbutaline and 50 ug.Procaterol were 28.62, 23.01, 10.15 and 6.23 % respectively. The drugs could be ordered in response to their efficacy on wheal size decreasing as follow 20 mg.Orciprenaline, 2 mg.Salbutamol, 2.5 mg.Terbutaline and 50 ug.Procaterol.