

Effect of Mesulergine and Buspirone on Diet Selection of Rats. Correlations to Serotonergic and Dopaminergic Mechanisms

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AIM

Serotonin (5-HT) leads to appetite suppression and influences dietary choices with significant alterations to caloric consumption and body weight as a consequence. The study of substances that act on the serotonergic system can contribute to the identification of the receptor(s) that are responsible for this behavior. Buspirone acts as an agonist to 5-HT_{1A} autoreceptors while mesulergine antagonizes 5-HT_{2C} receptors with simultaneous agonistic properties for D₂ receptors. Aim of the study is the identification of the role of the above receptor subtypes on food consumption and dietary choices (carbohydrate or protein enriched diet).

MATERIALS-METHODS

Sixteen groups of male Wistar rats were used (7 animals/group) 2 months of age and mean body weight 235±5 g that received: Placebo, buspirone (0.05, 0.1, 2, 4 mg/Kg), mesulergine (1.3 mg/Kg), combinations of the above, apomorphine (1 mg/Kg). Animals were individually housed in metabolic cages and were freely fed by two feeders with carbohydrate or protein enriched isocaloric diets. Experiments were performed according to food deprivation schedule after acclimatization period. Food intake was measured during refeeding period 4 hours after drug injections.

RESULTS

(a) Buspirone: An antiserotonergic type effect was observed with increased carbohydrate enriched diet consumption while protein consumption was spared at all doses used. b) Mesulergine: Protein intake was increased while carbohydrate was decreased at all doses used. c) Apomorphine: An effect similar to mesulergine was observed. d) Buspirone-mesulergine combinations: Increased protein intake with preservation or reduction of carbohydrate intake was observed in all dosing combinations.

CONCLUSIONS

Mesulergine a serotonin receptor antagonist (at 5-HT_{2C} sites) and dopamine agonist leads to food intake and diet selection of a solely dopaminergic profile (apomorphine). Buspirone effect on food intake and dietary choices is reversed when combined to mesulergine. Therefore: 1) Dopaminergic system has a prominent role in food intake and dietary choices, 2) Serotonin induced food intake and diet selection seems to be expressed through dopaminergic neurons, 3) Serotonin antagonism at 5-HT_{2C} sites by mesulergine does not seem to lead to antiserotonergic type dietary choices since the expression due to dopamine agonism is more prominent.