The Specific Role of GABA-A Receptors in Modifying Taste Perceptions in Rats

Abstract

Obesity is a growing problem in industrialized nations worldwide due to widespread availability of high-calorie, heavily processed foods. When the availability of these foods is coupled with access to certain prescription medications, the weight-gain effects can be compounded. Weight gain has been especially linked to the prescription of anxiolytic drugs. Many anxiety medications are benzodiazepines, which known to increase the hedonic value of tastants by increasing the inhibitory effects of GABA receptors in the PBN and causing a hyperphagic effect. One aim of this study was to establish a dose-dependent effect of the benzodiazepine chlordiazepoxide. Another aim of this study was to compare the effects of buspirone, another anxiety treatment drug which is not a benzodiazepine and does not act on GABA receptors, to determine the effect of GABA on the taste perception pathway. Rats were injected with either CDP (5mg/kg), buspirone (3mg/kg), or the control saline and licking was measured during 15-second trials of six appetitive and aversive tastants (sucrose, NaCl, quinine-HCl, citric acid, saccharin, MSG), one non-tastant (capsaicin), and the control water. It was found that for CDP, the aversive tastants seemed less aversive and the appetitive tastants seemed more appetitive, while there was no effect on the non-tastant. These results indicated that CDP affected the taste perception pathway by making food more palatable. It was found that for buspirone, licking decreased across all tastants except at high concentrations of sucrose (75 mM) and MSG (1500 mM); however, licking also decreased to water, indicating a sedative drug effect.

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