Effects of propranolol on baclofen-induced hyperphagia in rats

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We have previously demonstrated that both acute and chronic systemic administration of the GABA\textsubscript{B} receptor agonist baclofen (bac) increases food intake in non-deprived rats by a central mechanism of action (see Ebenezer et al., 1992; Patel et al., 2010). As part of a programme to investigate possible interactions of bac with central neurotransmitter / neuromodulator systems on ingestive behaviour, the present study was undertaken to examine the effects of the \(\beta\)-adrenoceptor antagonist propranolol (prop) on bac-induced hyperphagia. Male Wistar rats (\(n = 8\); body weight – 375 – 455 g) were injected i.p. with either saline (sal) followed 5 min later by sal, sal followed by bac (2 mg kg\(^{-1}\)), prop (5 mg kg\(^{-1}\)) followed by sal, or prop (5 mg kg\(^{-1}\)) followed by bac (2 mg kg\(^{-1}\)). Immediately after the 2nd injection the rats were placed singly in separate experimental cages with free access to food and water. Cumulative food intake was measured as described previously (Ebenezer et al., 1992). A repeated measures design was used with each rat receiving all treatments. The results for cumulative food intake at 60 min are shown in Fig. 1. Bac significantly increased food intake (\(P<0.01\)). Prop (5 mg kg\(^{-1}\)) had no significant effect on food intake compared with control data at 60 min. This is in contrast to higher doses of prop (e.g. 10 mg kg\(^{-1}\)) which reduce food intake at 60 min (Ebenezer, unpublished results). ANOVA revealed that there was a significant interaction between the treatments (\(F(1,7) = 7.6587, P<0.03\)) and post-hoc tests show that the hyperphagic effect of bac was significantly (\(P<0.05\)) reversed by pre-treatment with prop.

![Fig. 1. Effects of propranolol on baclofen-induced hyperphagia.](image)

It is unlikely that prop, which can also antagonise central 5-HT\(_{1A}\) receptors, elicits its action on bac-induced hyperphagia via a 5-HT mechanism because we have previously shown that the 5-HT\(_{1A}\) antagonist WAY 100635 does not reverse the effects of bac on food intake (Patel et al., 2007). These results therefore indicate that bac may interact with a noradrenergic system(s) to elicit its hyperphagic effects in non-deprived rats.

Ebenezer et al. (1992) Neuropharmacol. 31, 39 - 42

