the whole dose range, though the effect of 15 mg/kg was significant ($P < 0.05$). With sotalol accuracy was impaired over the dose range 5–20 mg/kg at 1 h ($P < 0.001$) and at 4 h ($P < 0.05$). The effect with 20 mg/kg was highly significant ($P < 0.01$) and persisted to 4 h ($P < 0.05$).

From these and the previous study (Clancy *et al.*, 1977) it would appear that, with the antagonists studied, (−)-propranolol and sotalol have the least effect on accuracy of response, and metoprolol and oxprenolol have the least effect on total response time. β-adrenoceptor antagonists may have differential effects on the nervous system, and impaired accuracy and increased response time may represent central and peripheral effects of these drugs.

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The effects of piracetam on acquisition and retention of habituation

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Piracetam has been found to improve the performance of animals in several learning and memory tests (Giurgea, 1972, Bryant, Petty & Byrne, 1973, Sara & David-Remacle, 1974, Wolthius, 1971). In the present study we have investigated the effects of this drug on short and long term habituation (i.e. the progressive response decrement to repeated stimuli).

Exploration and its habituation were tested in a 4-hole holeboard (File & Wardill, 1975) and in this experiment, rats were injected (i.p.) daily with piracetam (100 mg/kg) or saline 30 min before testing. They were placed singly in the holeboard for 10 min, at the same time of day, every day, for ten days. The time spent head-dipping and the level of motor activity were recorded automatically. The control animals exhibited the characteristic response of a reduction in head-dipping between days (between day habituation) until a baseline was reached. Piracetam did not affect motor activity but it prevented between day habituation. This meant that the initial level of exploration was higher with piracetam on each day and although there appeared to be greater within-session habituation, this may have been due to the higher initial levels.

In order to study within-session habituation, we chose a task in which discrete trials were under the control of the experimenter. Tones were presented to rats until an habituation criterion was reached of 3 successive tones causing no distraction. It was found that piracetam treated animals habituated significantly faster i.e. took fewer trials to reach criterion on the first day than did the controls. On retest, one week later, the control animals showed a significant reduction in trials to criteria revealing retention of the previously learned information, whereas piracetam treated animals showed no retention.

Thus, whilst piracetam produces faster habituation within a session, it impairs 24 h retention of habituation of exploration and one week retention of habituation of distraction.

Sara & David-Remacle (1974) have suggested that piracetam enhances acquisition in tasks which take place over a series of days by facilitating retrieval of partially learned responses. Our findings suggest that the time interval over which piracetam may exert its facilitative effects is task dependent and that variations in time intervals may result in impairment of retention.

The pattern of results obtained with piracetam will be compared with results obtained in these tests with other drugs in an attempt to characterize the actions of piracetam.

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