

A MICROCOMPUTER SYSTEM FOR THE COLLECTION AND ANALYSIS OF OPIATE SIDE-EFFECT DATA

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Morphine-like drugs possess potent analgesic properties but their use is restricted by many adverse side-effects. Evaluation of these side-effects in rodents uses large numbers of animals and is time-consuming. In order to minimise these factors several tests have been compiled into a single test schedule in which the following effects are assessed in each animal: Straub tail, respiratory rate, hot plate and tail-flick reaction latencies, pupil diameter, body temperature, sedation (rotarod) and gastrointestinal propulsion.

Previous studies using this schedule have shown that the side-effects of μ - and k -opioid receptor agonists can be distinguished and that there is no interaction between tests when they are carried out in the above order (Hayes & Tyers, 1983). However, manual collection and de-coding of the large amount of data generated in each of these studies are time-consuming and susceptible to transcription errors. A floppy-disc microcomputer system has thus been developed to collect, decode and statistically analyse these data.

Studies are carried out by three operators; the first operator monitors Straub tail response, pupil diameter, respiration rate, body temperature and tail-flick reaction latency. The latter three parameters are recorded using dedicated equipment interfaced to a microcomputer, whereas the former two parameters, together with general side-effect data, are entered manually. Rodents are then passed to a second operator who tests for hot-plate and rotarod reaction latencies; both these measures are interfaced to a second microcomputer.

The interactive microcomputers are connected to each other via a high speed interrupt-driven bidirectional serial link. Information regarding side-effects observed by the first operator are passed automatically via the serial link and displayed on the visual display unit of the second operator, who may then add side-effect data if necessary. The third operator measures the distance that a charcoal meal travels along the gastrointestinal tract. These data are entered, by hand, into the second microcomputer.

On completion of the experiment, all data from the second microcomputer are passed back to the first where they are sorted and sent via a dedicated serial link to a network of PR1ME supermini computers for statistical analysis. Within 10 minutes of the end of the experiment the vast volume of accumulated data is decoded, analysed and dose-response curves plotted automatically on a Calcomp plotter. Before this system was introduced data analysis for each test took approximately 7 man hours.

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Hayes, A.G. and Tyers, M.B. (1983). Br. J. Pharmac., 79, 731 - 736.