*LETTER TO THE EDITOR*

## A SIMPLE TECHNIQUE OF SCREENING NARCOTIC ANALGESICS

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Sir,

Use of Monsanto hardness tester as a method of applying pressure to rat's tail for producing pain threshold has been assessed. The method has been found to be convenient and reproducible results were obtained.

For screening the narcotic analgesics mechanical methods viz 'Tail Clip Method' (1) and 'Caudal Compression Method' (3) have long been described. In 'Caudal Compression Method' measurement is made of the gradual increase in pressure on the tail in mm of mercury by the use of a special mechanical drive. Dandiya and Menon (2) have suggested a modification of the Caudal Compression Method; however, the modification does not indicate the amount of pressure applied. The present article describes a simple modification of Caudal Compression Method which has the advantage of both methods.

In our method, "Monsanto Hardness Tester", an instrument designed by Monsanto Chemical Co. Ltd. (4) for testing the hardness of tablets was used for measuring the pressure causing struggle or squeak. The instrument measures the pressure in kilograms. The pressure was measured at the middle of the tail by placing the tail of the albino rats (150-200 g) between the spindle and anvil. When the tail was just held between the spindle and anvil, reading of the pointer in the scale was adjusted to read zero and then the pressure increased gradually by turning the Knurled Knob. Reading on the pointer for estimation of pain threshold was taken when the rat responded by struggle. The small pressure was then released by turning back the knurled knob instantly. This method of measuring pain threshold was standardised for its sensitivity, reproducbility and reliability by repeated tests. Drugs used were morphine sulphate and methadone hydrochloride in various doses.

The mean threshold pressure which could elicit a struggle was measured in a group of 60 albino rats in a mixed population of both sexes and was found to be 1.53 *kg.* $\pm$ SE 0.06.

To test the reproducibility of the method, a group of 10 normal rats was screened 5 times at 30 min intervals and also each morning and afternoon for three consecutive days.

Reproducible results were obtained in both cases. The absence of systemic variance among repeated readings showed that with normal threshold pressure, no damage was sustained by tail. Similarly no obvious physiological damage to the tail was observed in rats treated with analgesics after the application of pressure of three times the average control value but in rats injected with high doses of morphine sulphate (more than 8 *mg/kg*) a pressure of 6 *kg* or higher caused bruising of the tail.

For quantal results by this method, groups of 10 rats were tested at various doses. An animal was considered to show positive analgesia when its threshold was twice that of the mean of a control group (2,3). A linear relationship was observed between the log dose and the probit among the rats showing analgesia with morphine sulphate and methadone hydrochloride. The $ED_{50}$ by ip route for morphine sulphate was found to be 5.2 *mg/kg* and that of methadone hydrochloride was 3.2 *mg/kg*.

The use of "Monsanto Hardness Tester" for measuring the pain threshold causing struggle was found to be convenient and with little practice reproducible results were obtained. The instrument is easily available in the market with guaranteed parity between testers.

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