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Locomotivity and learning ability test methods in offspring from dams exposed to new drugs

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A battery of behavioral function tests is required for the peri- and postnatal toxicity studies of new drugs, especially for those of CNS drugs. It is commonly accepted that behavioral function tests, such as acoustic startle response, visual response, locomotion and learning ability, should be conducted to detect drug-induced behavioral function disorders quantitatively and objectively using offspring from dams exposed to new drugs. Recently, the accuracy and reliability of the conventional methods for these tests have been reported inadequate in some cases. In the present study, new behavioral function test methods to measure locomotion and learning ability were established. Using the Infra Mot System, voluntary activity of 16 male and female rats was measured after oral treatment with 1 mg/kg diazepam. Vehicle control group received the same amount of distilled water. The male rats showed the minimum voluntary activity frequency in 30 min after administration, while the female rats showed it in 60 min. These animals recovered gradually from the depressed state. In the passive avoidance test, adaptation test was performed on the first day, and the main test was performed on the following day. For the main study, 1 mg/kg scopolamine was administered intraperitoneally to 10 male rats. Vehicle control group of 10 male rats received the same amount of vehicle. The passive avoidance abilities of the treatment group were not different from those of the vehicle control group the first day, but showed significant decrease compared to the vehicle control the second day. In the Morris Water Maze test, 1.5 mg/kg scopolamine was administered intraperitoneally to 10 male and female rats. Then short-term memory ability was measured using the Video Tracking System. Vehicle control group received the same amount of distilled water. The learning memory of treatment group was significantly decreased, when compared with the vehicle control group.

In conclusion, the behavioral functional test methods established in this study were found to be more reliable than the conventional methods in obtaining objective and dependable

data for the reproductive toxicity studies.

Keyword : Behavioral Functional Test, Locomotion, Learning and Memory, Diazepam,
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