An Unexpected Incidence of Convulsive Attack in Male Mice after Long-Term Isolated Condition

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TAKEMOTO, T., SUZUKI, T. and MIYAMA, T. An Unexpected Incidence of Convulsive Attack in Male Mice after Long-Term Isolated Condition. Tohoku J. exp. Med., 1975, 115 (1), 97-98 —— Unexpected convulsive attacks were observed in male dd-D mice which were reared for a long-term experiment. After three months from the onset of rearing, some of mice showed convulsive attacks when they were handled in such routine laboratory procedures as weighing, clearing of cage and feeding. The convulsive attack was observed only among the mice being reared individually in each of sections of cage and did not occur in the mice which had been reared as a colony. The incidence rate of convulsive attack increased as the rearing period was prolonged. Our finding was similar to King and coworkers’ report (1955) in which convulsions were observed in the singly housed C3H mice. The one thing particular in our observation was the difference of incidence rate according to the extent of isolation, i.e., the higher rate was observed on the condition of mice without other mice in the neighbouring sections than those with neighbouring mate. The neighbouring mate acted some roles to change susceptibility to convulsive attack, even though separated by a sheet of wire-netting.

convulsion; isolated condition; long-term rearing

This is a description of an unexpected incidence of convulsive attack in male mice which had been reared in isolated conditions for a considerable long period. The data are not the result of a well designed experiment, but those by epidemiological observations on experimental animals.

For the purpose of some toxicological experiments, the dd-D closed colony male mice of six weeks after birth were assigned respectively to one of the individual sections of cage which was made by a wire-net and divided ten sections (cage, 17×8.5×11 cm; section, 17×8.5×11 cm). The remaining mice were kept as colony in a collective cage.

The animals were reared in an air-conditioned room in which no particular shelter against noise, light and other environmental stimuli were facilitated. The commercial diet for mice and water were given ad libitum.

Since three months after the onset of rearing, some mice which were reared in individual sections tended to show convulsive attacks associated with such routine procedures as weighing, cage clearing and feeding. At that time, no convulsive attack was observed in mice being reared as a colony. The incidence rate of convulsive attack was increased by the elongation of rearing period as shown in Table 1, in which the incidence rate increased generally from 24 weeks after the onset of rearing to 28 weeks after. Moreover, there was a clear difference in the incidence rate with housing conditions. As shown in Table 1, the

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order of incidence rate was as follows; the mice not neighboured with other mice, the mice neighboured only one side of section and the mice neighboured in both sides.

The similar convulsive attack to that experienced by us was already reported by King et al. (1955) on the singly caged male C3H mice. Making reference to King and coworkers' report, the one thing particular in our experience was the difference of incidence rate among three housing conditions. Even though separated by a wire-netting, the presence of neighbouring mate gave an influence on susceptibility to convulsive attack.

Apart from the incidence of convulsion, some research workers mentioned various physiological and behavioral peculiarities in the animals reared in isolated conditions (Hatch et al. 1965; Wiberg et al. 1966; Moore 1968), and the peculiarities have been called as isolation syndrome (Hatch et al. 1965).

As some of references mentioned, the mechanism of induction of the convulsive attack may be the hyperadrenocortism caused by prolonged isolation. In relation to this problem, we have carried out the designed experiment on mice, and the result will be reported separately.

References