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Social isolation stress enhances the effect of 5-HT1A agonist 8-OH-DPAT on the rat elevated plus-maze

Noppamars Wongwitdecha*[1] and Nattaporn Yoopan[2]

Address: [1]School of Medicine, Walailak University, Nakhon Si Thammarat, Thailand and [2]Department of Pharmacology, Faculty of Science, Mahidol University, Bangkok, Thailand

* Corresponding author

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Social isolation stress in the early stages of life has been shown to alter a variety of behaviors in the mature animals and the responsitivity to psychoactive drugs. The aims of the present experiments were to investigate the effect of rearing rats in social isolation on anxiety using the elevated plus-maze and to compare the effect of the selective 5-HT1A receptor agonist, 8-hydroxy-2-(di-n-propylamino)tetralin (8-OH-DPAT) on the plus-maze behaviors in isolation and socially reared rats. Male Wistar rats were reared from weaning (21 days of age) either alone (isolation rearing) or in groups of six rats/cage (social rearing) for four weeks. Both isolation and socially reared rats were exposed to the elevated plus maze either without drug pretreatment or following acute administration of 8-OH-DPAT (0.05, 0.1 and 0.5 mg/kg s.c.) or saline 30 min before a 5 min test. The results show that the plus-maze behaviors of the drug free isolation reared rats were not significantly difference from the socially reared rats. Pretreatment of 8-OH-DPAT (0.05, 0.1 and 0.5 mg/kg s.c. 30 min before testing) in both isolation and socially reared rats produced a dose-related anxiogenic profile, indicated by a reduction in the percentage of open arm entries and the percentage of time spent on the open arms. The anxiogenic-like effect of 8-0H-DPAT was greater in the isolation than the socially reared rats ($P<0.05$). The results suggest that social isolation stress from the early stages of life may produce some of the behavioral effects through central serotonergic mechanisms. 8-OH-DPAT produces greater responding in social isolation stress rats, indicating supersensitivity of the postsynaptic 5-HT1A receptor in the stress rats.