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Induction of behavioural dependence on alcohol and an opioid in rats:

Presenting the drugs in palatable (sweet) fluids

WOLFFGRAMM and HEYNE described for the first time in 1995 an animal model to induce behavioural dependence in rats. Other authors could not repeat their results (MÜLLER 2000). That is the reason why we investigated the influence of presenting alcohol and an opioid (etonitazene) in palatable (sweet) fluids to the induction of behavioural dependence on these drugs in rats in an animal model based on the results of WOLFFGRAMM et al. and MÜLLER.

For all experiments male Wistar rats were used.

In the first experiment the rats had the choice between two different alcohol concentrations (5% and 15%) in sweet fluids (strawberry or sugar taste) and tap water presented either all the time or every 24 hours for one day. After week 45 the alcohol was presented only in tap water until the end of the experiment (week 58). To check the development of behavioural dependence the alcoholic solutions were mixed with a bitter substance (quinine) or another bottle with the sweet fluid without alcohol was placed to the disposal.

The consumed amount of alcohol decreased steadily. When the sweet fluid was replaced by tap water the decrease was even more impressive. After addition of quinine or presentation of another bottle with sweet fluid the rats nearly stopped the ingestion of the alcoholic solution.

In the second experiment the rats were treated similar to those of the first experiment. They had the choice between a sweet alcoholic solution with a concentration of 20% and tap water over 32 weeks. After week 32 the alcohol was presented in tap water. From week 36 until the end (week 44) the concentration of the alcohol was increased to 30%.

The consumption of alcohol decreased over the course of the trial and also every time the alcohol was mixed with quinine or another bottle with sweet fluid was presented.

Altogether in both experiments none of the animals showed signs of behavioural dependence to alcohol during the course of the trial.

For the third experiment raising concentrations of an opioid (etonitazene, ETZ) were presented to the rats in sweet fluids. The schedule was similar to the other experiments. From week 25 to 28 the animals were deprived from the drug. After week 33 until the end (week 44) ETZ was soluted in tap water. The same tests as before to control the development of behavioural dependence were done.

Until the weeks of drug deprivation the rats increased the consumed amount and decreased only few their drug intake during the control tests. But after replacement of the sweet fluid by tap water the rats showed an enormous and continuous decrease of the drug intake.

Therefore even in this experiment with ETZ no behavioural dependence in the animals could be induced

To conclude, we can say that even with some changes as the presentation of the drug in sweet fluid this animal model is not reliable to induce behavioural dependence in the rats.