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EFFECTS OF NICOTINE ON IMPLANTATION ON SPRAGUE DAWLEY RATS

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Abstract

The effect of the nicotine on the number of implantation site was studied in the Sprague Dawley rat. The finding of this experiment resembles the bad effect of nicotine in the cigarettes to the pregnancy women especially on the early stage of embryo's implantation.

0.5 ml of nicotine (5mg/kg body weight) was injected subcutaneously to the pregnant female Sprague Dawley rats according to the group that has been divided. There were three groups involved which were control group (no nicotine induced), nicotine induced group from day one to and day five of pregnancy and nicotine induced group from day one to day nine of pregnancy. On day tenth of pregnancy, laparatomy was done to observed the implantation sites.

The implantation sites from nicotine induced groups were compared with the implantation sites of control group. After the pups were delivered, the numbers of pups were compared between control group and nicotine induced group. From result obtained, there were significant different between the nicotine induced groups and the control group. Nicotine induced group from day one until day nine of pregnancy showed the lowest means for both implantation sites and also for numbers of pups delivered.

The mean for implantation sites for nicotine induced group from day one until day five of pregnancy were 8.70, meanwhile mean of pups were 5.70. The mean for implantation sites for nicotine induced group for day one until day nine of pregnancy were 6.4 and the mean of pups were 2.70. According to independent t-test from SPSS programme, there were significant different between each of the group when $P< 0.05$.

Chapter 1

Introduction

1.1 Background of Study

Nicotine is a primary component in the tobacco (Benowitz et al., 2005). It is also one of more than 4000 of chemicals that can be found in a cigarette (World Health Organization, 2013). Nicotine can cause addiction to smokers due to its ability to stimulate the brain (Biasi et al., 2011). Although the amount of nicotine that reach into the brain is relatively minor, but nevertheless sufficient to cause the addiction to the smokers (Zhou et al., 2009).

Studies shown that although many smokers intended to quit smoking, but only one-third of them are successfully quit each year. According to the National Health and Morbidity Surveys (NHMS) of 1996/1997 about 17.7% of female were heavy smokers (Ministry of Health, 1997). The number of smokers among pregnant women also increased approximately 15% (Substances Abuse and Mental Health Services Administration, 2010). Maternal smoking is associated with several adverse developmental effects in the offspring. It includes spontaneous abortion, increase in Sudden Infant Death syndrome (SIDS), preterm delivery and psychiatric disorder (Shea, 2008).

Nicotine gives various bad effects in pregnant rats. It has been reported to prolong the gestation period in rats (Becker et al., 1968; Timiras et al., 1972). They found that the offspring produced by the nicotine-treated rats were smaller than normal. There was a study showed there were delay of implantation on the nicotine-treated rats (Pilot et al., 1979) . In year 1985, Mitchell and Hammert found that nicotine has an effect on the oviducal blood flow and the development of the embryo in the rats (Mitchell et al., 1985).