

ABSTRACT

In recent years interest has mounted concerning the role of marihuana on reproductive physiology. Various reports in the literature suggest that marihuana influences female reproduction, and pose significant risks for the offspring. It has also been blamed for its embryotoxic/foetotoxic and teratogenic manifestations in animals. These reports are conflicting, confusing and sometimes contradictory. However, it could be conceived that marihuana use induces reproductive hazard. Moreover, marihuana has been used for facilitating childbirth and was tried in the management of menstrual disorders, but there is no evidence to establish the scientific basis for such claims. Despite the widespread use of marihuana, there are only a few studies available describing the effects of this drug in the female.

This study was designed to investigate the potential effects of marihuana smoking on female reproductive process and foetal development.

Albino rats were utilized for this experiemnt due to various practical advantages like availability, low cost, large number of animals per litter and brief gestation periods. Marihuana smoking has been employed to mimic human use and to restrict the use of heavy doses. Uterine smooth muscle contractility was studied to determine the influence of marihuana extract and the consequences of smoke exposure on uterine contractility.

A chronic study, i.e. follow-up through two generations, was carried out since acute effects of marihuana may be insignificant and since continuous maternal exposure could damage the foetus and chronic use could have further deleterious effects. During this study a close watch was kept on the body weight to rule out the possible influence of undernutrition which may affect the reproductive function.

Marihuana smoking has resulted in the reduction of body weight within the first week, but these animals later demonstrated a positive gain in weight and did not exhibit any obvious signs of undernutrition. A positive gain in body weight suggests development of tolerance following the smoking exposure. All the marihuana smoke-exposed rats exhibited delayed onset of oestrous activity but frequent oestrous cycles with a reduction in the duration of oestrous period. Such a change could interfere with the fertility rate. Smoking also has resulted in suppression of ovulation. The fertility index (number of pregnant females/number of mated females) was significantly lowered. Other observations were shortened gestation period, low birth weight and diminished litter size. Reduction in fertility index and the gestation period may be the consequence of uterine stimulatory action of marihuana or suppressed ovarian activity. Low birth weight and reduction in the litter size could be due to probable embryotoxic effects of interference

with transport mechanisms.

Uterine contractile responses produced by crude aqueous marihuana extract (CAME) were significantly higher in the smoke-exposed rats. CAME seems to depolarize the uterine smooth muscle, by activating the muscarinic receptors. Chronic exposure to marihuana smoke seems to alter this response at receptor level. CAME is shown to possess both contractile and relaxing properties with dominant activity of the former.

Chronic exposure to marihuana smoke resulted in appearance of tumours, like serous cystomata, follicular cysts, telangiectatic cysts, adenofibroma and adenocarcinoma in 50% of the experimental animals. The significance of this uterine stimulatory and tumorigenic potential of marihuana may have far-reaching consequences due to interference with foetal blood flow. Such a situation could lead to deficient transport of O_2 , nutrients and toxic metabolites and precipitate not only foetal underdevelopment, but also reduction in litter size.

Use of marihuana seems to influence the reproductive activity in females as evidenced by delayed onset of oestrous activity, frequent oestrous cycles with reduced fertility index, shortened gestation periods, increased litter mortality, low birth weight, etc. This study clearly indicates that the marihuana smoke not only affects the maternal well-being but also jeopardizes the conditions under which the foetuses grow and develop.