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Studies on the toxic effect of arsenic in the reproduction of female mice (*Mus musculus* Linn. 1758)

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Abstract: Arsenic is regarded as one of the most toxic element that functions as toxicant in humans as well as the laboratory animals. Exposure of high doses of arsenic not only leads to malfunctioning of the reproductive organs but also leads to change in its structure. In mice induction of methylated or inorganic arsenic repeatedly leads to reproductive toxicity as well as developmental toxicity. Arsenic given to the pregnant mice in repeated oral state also lead toxic effect in its development respectively.

Key words: Toxic, *Mus muscullus,* arsenite, histomorphological, diestrous cycle.

INTRODUCTION

Arsenic is among the most measurable quantities of element found in water, soil & air also in earth crest.[1,2] China, India, America etc are the countries where arsenic concentration has been reported very high.[3,4,5] Arsenite, arsenate are the different compounds of arsenic that causes chronic as well as acute damage to human beings and other organisms. Organs that usually get affected due to the impact of arsenic are those that are involved in excretion, absorption etc.[6] Toxicity of arsenic does not only occurs due to diet containing high amount of arsenic content but also through inhaling arsenic in industries & also when we come across to herbicides & pesticides.[7] Arsenic for most of the bacteria function as respiratory metabolites trace quantity are also regarded as very essential in few animals such as rats, goat, chicken, and other species. There are also certain evidence that shows that arsenic has adverse effect on human reproductive health[8] which may cause certain health hazards such as low birth weight, spontaneous abortions, infant mortality etc.[9,10,11,12] According to united states environment protection agency arsenic are also regarded as risky for human health.[13] The toxic effect of arsenic is also seen in reproductive system of rodents.[14]

As we know there is great impact of high arsenic intake in the organism although there are very few evidences which tell us about the toxicity of high arsenic intake.

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MATERIAL AND METHODS

Experimental animals

Female mice belonging to the species *Mus musculus* was selected for the study toxic effect of arsenic in reproduction. 40 mice were bought which were about 45 days from the local market and was kept in laboratory for

its further study. All the mice were kept in normal laboratory condition and fed with standard diet and normal tap water. These mice were then allowed to mate. 18 female pregnant mice having average body weight were then selected & divided into three groups each having 6 animals. Each of the groups was dived into control group, group 1 & group 2. Control group of the mice were fed with normal diet, group 1 of the mice were fed with diet having 100 ppm arsenic & the other group was fed with 200 ppm ie high doses of arsenic for about three weeks. The animals were then sacrificed for the study of different reproductive organs.

Collection of the blood & tissue sampling

The sacrificed species were then kept in the laboratory for its histomrphological study. Blood was collected from each of the mouse and was kept separately for its reproductive hormonal study. The pregnant mice were then dissected to study the different reproductive organs. The tissues of the reproductive organs were the dissected out. The sectioned tissues were then stained with hematoxylene & eosine to study the histomorphology.

RESULT & DISCUSSION

- **Histopathological study**
  After the completion of experiment it was found that there was great changes in morphology of the group 2 mice tissue compared to the group 1 & control group. In the pregnant mice of control group there was no changes observed in the morphology of uterine structure while in group 1 & group 2 the uterine horn (the point where the uterus and the fallopian tubes meet) appeared very thin.
- **Weight of the ovary & uterus**
  There was great variation found in the weight of the ovary & uterus. The weight of the group 2 mice was very much decreased with respect to the group 1 species. When the LH, FSH & Estradiol level found in plasma was estimated, its quantity was also decreased. Thus decreased FSH, LH, estradiol lead to decrease in the ovarian activities. Since all the above are very important for the reproduction to take place successfully. Thus the diet containing high arsenic quantity may lead to decreased reproduction. Thus decreased plasma level may lead to diestrous cycle.
- **Degeneration of ovarian & uterine cell**
  High arsenic level in rat also lead to degeneration of different cells found in ovary and uterine which acts as a inhibition factor for the reproduction in mice (Chattopadhyay *et al*. 2003).[14]

CONCLUSION

From the above observations it is found that increase in the level of arsenic lead to decreased production of healthy follicles & increased apoptotic follicles, thus inhibiting the process of reproduction in mice. Great difference was observed in mice treated with 200 & 100 ppm of arsenic in diet in contrast to control group where the process of reproduction was found to be very normal.

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