HAEMATOLOGICAL CHANGES IN PREGNANT RATS AND THEIR DESCENDANTS DUE TO TERATOGENIC DOSE OF CADMIUM CHLORIDE

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INTRODUCTION
In recent years there has been a great concern over heavy metal pollution. Among them, cadmium is highly toxic and one of the most important pollutant. Batteries are the main source of pollution, However, combustion of coal, mineral oil, smelting, mining, alloy processing and many other industries that use cadmium are also potential source of cadmium pollution (Friberg et al., 1976; Swarup et al., 2007).

From earlier reports, it is evident that in mammals cadmium at moderate doses appears to produce kidney damage (Bernard, 2004) and hypertension (Schroeder, 1965). It has also been implicated in the causation of och-ouch disease in Human beings (Tsuchiya, 1969). In another study Mlynarcikova et al. (2005) reported female infertility in humans following exposure to cadmium through cigarette smoke. However, their exists a lacunae regarding its effects on haematological parameters of mammals especially during pregnancy. Hence, an attempt has been made to evaluate the effects of teratogenic dose of CdCl₂ in pregnant rats as well as their offsprings.

MATERIALS AND METHODS
Virgin rats (Rattus norvegicus) were procured and maintained in well conditioned animal house for a week and were fed with food and water ad libitum. Adult females, weighing 170 ± 10g, in different groups were administered orally with different doses of CdCl₂, dissolved in distilled water for 24h. LD₅₀ was calculated by probit method (Finney, 1971) and was found to be 270mg/kg. Experiment protocols involving the use of animals were approved by the animal ethics committee. Virgin adult female rats were caged overnight with virgin males. The day, on which a sperm was found in the vaginal smear, was taken as day 1 of pregnancy. Teratogenic dose was evaluated by administering different doses of CdCl₂ (0, 2.5, 5, 10, 15, 20 mg/kg ) to the above pregnant rats orally from day 7 to 15 of gestation. Since fetuses from dams treated with 15 mg of CdCl₂/kg body weight, showed morphological anomalies like short tail, syndactyly etc., hence this dose was selected as teratogenic dose for the present study. Blood samples were collected on day 15 and 20 of gestation period of control pregnant rats as well as pregnant rats administered with teratogenic dose of CdCl₂. The changes were more prominent on 20th day when compared to 15th day pregnant rats. However no significant change was noticed in the offsprings from these dams, when their blood was checked for the same parameters on day 10th and 30th of their postnatal age. Thus, results of the present study revealed that haematological parameters of maternal blood are quite susceptible to teratogenic dose of CdCl₂ than to produce alterations in their offsprings.

RESULTS AND DISCUSSION
In pregnant rats, teratogenic dose of CdCl₂ has produced

KEY WORDS
Haematology
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Rat
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ABSTRACT
The present study was envisaged to evaluate the effect of teratogenic dose of Cadmium Chloride (CdCl₂) in pregnant rats as well as their descendants on haematological parameters. Teratogenic dose (15mg of CdCl₂/kg body weight) when given to pregnant rats from day 7 to 15 of gestation has caused a marked elevation in Red blood corpuscles (RBC), Haemoglobin (Hb), packed cell volume (PCV), mean corpuscle haemoglobin concentration (MCHC) and white blood corpuscles (WBC) on day 15 and 20 of gestation period. In contrast we noticed a fall in mean corpuscle volume (MCV) and mean corpuscle haemoglobin (MCH) in dams treated with teratogenic dose of CdCl₂. The changes were more prominent on 20th day when compared to 15th day pregnant rats. However no significant change was noticed in the offsprings from these dams, when their blood was checked for the same parameters on day 10th and 30th of their postnatal age. Thus, results of the present study revealed that haematological parameters of maternal blood are quite susceptible to teratogenic dose of CdCl₂ than to produce alterations in their offsprings.
The teratogenic dose of CdCl$_2$ increased the PVC of blood of intoxicated rats appear contrary to this there were no significant changes in the haematological parameters in litters of 20 and 30 days old when compared to that of controls (Table 2).

The probable reason for the increase in RBC count and haemoglobin (Hb) concentration, packed cell volume (PCV) and WBC on day 15 and 20 of gestation period (Table 1). MCHC was also fairly increased but a fall in MCV was observed in the values of various parameters when it was compared with the controls. Contrary to this there were no significant changes in the haematological parameters in litters of 20 and 30 days old when compared to that of controls (Table 2).

The results clearly showed the prevailing hypoxic conditions in pregnant rats following administration of CdCl$_2$. The changes noticed in haematological parameters in this study also suggests adaptive capabilities of pregnant rats to changed physiological conditions. It is also evident that, though CdCl$_2$, at teratogenic dose has significant effect on haematological parameters of maternal system, but has no or very little effect on fetal blood parameters.

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### REFERENCES


HAEMATOLOGICAL CHANGES IN PREGNANT RATS


