SUMMARY

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Air pollution is the most dangerous form of pollution as it can expose a person to about 10.000 times more mass of an environmental pollutant than does food or water.

Gasoline is the primary product of petroleum refining and it perhaps the most widely used energy source in the world. In addition to industrial applications, the ready availability of gasoline to power automotive engines, there are increasing opportunities for occupational and environment exposure to this liquid fuel.

With the removal of lead from gasoline and the use of new technologies, it is very important to conduct studies of toxic effects of reformulated gasoline (unleaded gasoline) which will shed the light on this new formula and either it is more or less benefit than the old one. The objective of this work was to asses the health effects of unleaded gasoline refined and used in Egypt. In this regard, the test substance, unleaded gasoline vapor, was judged to be representative of the material to which human are exposed. Thus the data are relevant for the assessment of potential exposure. Three groups of adult male albino rats (8 rats each) (I, II & III) were exposed in the present study to unleaded gasoline vapor (1, 2, 4 g/m^3 for 4 hr daily – 5days/week for eight weeks respectively) to investigate changes in some physiological and histopathological parameters as compared to a control group (8 rats). The obtained results were as follow :

[1] Animal observation :

No animal died during the study. Ataxia, hypoactivity and labored respiration were observed in group III exposed to the higher level of unleaded gasoline vapor.

[2] Body and organ weights :

Significant decreases in body gain were observed in all treated groups. The decreases in body gain were higher in group III (exposed to 4 g/m^3 of unleaded gasoline) than those of groups I (exposed to 1 g/m^3 of unleaded gasoline) & II (exposed to 2 g/m^3 of unleaded gasoline). Organ weights were not affected significantly with exposure to unleaded gasoline except testes weight which was significantly increased.

[3] Blood parameters :

Significant declines in Hb contents and RBCs counts were observed in all treated groups. The decreases were concentration dependant i.e., the higher the exposure level the higher the decrease of Hb content. The WBCs counts showed non significant decreases in treated animal groups compared to the control one. The differential WBCs count indicated significant increases in neutrophils of all treated groups compared to control one, while the lymphocyte number showed significant reductions in all treated groups. No significant changes in the number of monocyte, eosinophil and basophil were observed.

[4] Respiratory functions of blood :

Blood gase and acid-base status parameters indicated the onset of respiratory alkalosis that represented by the decrease of PCO_2. These respiratory alkalosis may be partially compensated by metabolic acidosis that indicated by the decrease in pH, HCO^-_3, TCO_2 and BE. The oxygen equilibrium curves of treated

animals were shifted to the left with decreases in their P_{50} due to the decrease in PCO_2, anemia and hypoactivity of the animals. The increase in blood oxygen affinity was non significant due to the compensation occurred by the kidney.

[5] Liver Enzymes (AST and ALT) :

The levels of AST revealed a significant increase in all treated groups while the increase in the levels of ALT was non significant.

[6] Serum levels of Urea and Creatinine :

The levels of urea decreased in all treated groups except group II (exposed to 2 g/m^3) which showed an increase in urea level. The levels of creatinine also decreased non significantly in all treated groups.

[7] Seurm level of cholinesterase :

Seurm levels of cholinesterase were non significantly high in all treated groups compared to control one.

[8] Serum levels of immunoglobuline G (IgG) :

Immunoglobuline G (IgG) showed a non significant decline in all treated groups compared to that of the control.

[9] Serum level of corticosterone :

Serum levels of corticosterone showed marked and significant increases in all treated groups compared to that of the control one.