# PHYSIOLOGICAL CHANGES INDUCED B INHALATION OF UNLEADED GAOLINE IN ADULT MALE ALBINO RATS

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Air pollution is the most dangerous form of pollution as itcan expose a person to about 10.000 times more mass of anenvironmental pollutant than does food or water.Gasoline is the primary product of petroleum refining andit perhaps the most widely used energy source in the world. Inaddition to industrial applications, the ready availability ofgasoline to power automotive engines, there are increasingopportunities for occupational and environment exposure to thisliquid fuel.With the removal of lead from gasoline and the use of newtechnologies, it is very important to conduct studies oftoxiceffects of reformulated gasoline (unleaded gasoline) which willshed the light on this new formula and either it is more or lessbenefit than the old one. The objective of this work was to assesthe health effects of unleaded gasoline refined and used inEgypt. In this regard, the test substance, unleaded gasolinevapor, was judged to be representative of the material to whichhuman are exposed. Thus the data are relevant for theassessment of potential exposure. Three groups of adult malealbino rats (8 rats each) (I, II & III) were exposed in the presentstudy to unleaded gasoline vapor (1,2, 4g/m3 for 4 hr daily-e.5days/week for eight weeks respectively) to investigate changesin some physiological and histopathological parameters ascompared to a control group (8 rats). The obtained results wereas follow:(I) Animal observation:No animal died during the study. Ataxia, hypoactivity andlabored respiration were observed in group III exposed to thehigher level of unleaded gasoline vapor.(2) Body and organ weights:Significant decreases in body gain were observed in alltreated groups. The decreases in body gain were higher in groupIII (exposed to 4 g/m3 of unleaded gasoline) than those ofgroups I (exposed to I g/m3 of unleaded gasoline) & II (exposedto 2 g/m3 of unleaded gasoline). Organ weights were notaffected significantly with exposure to unleaded gasoline excepttestes weight which was significantly increased.(3) Blood parameters:Significant declines in Hb contents and RBCs counts wereobserved in all treated groups. The decreases were concentrationdependant i.e., the higher the exposure level the higher thedecrease of Hb content. The WBCs counts showed nonsignificant decreases in treated animal groups compared to thecontrol one. The differential WBCs count indicated significantincreases in neutrophils of all treated groups compared tocontrol one, while the lymphocyte number showed significantreductions in all treated groups. No significant changes in thenumber of monocyte, eosinophil and basophil were

observed.(4-]Respiratory functions of blood :Blood gase and acid-base status parameters indicated theonset of respiratory alkalosis that represented by the decrease ofPCOz. These respiratory alkalosis may be partially compensatedby metabolic acidosis that indicated by the decrease in pH,HCO-3, TCOz and BE. The oxygen equilibrium curves of treatedanimals were shifted to the left with decreases in their Pso due tothe decrease in PC02, anemia and hypoactivity of the animals.The increase in blood oxygen affinity was non significant due tothe compensation occurred by the kidney.(5) Liver Enzymes (ASTand ALT):The levels of AST revealed a significant increase in alltreated groups while the increase in the levels of ALT was nonsignificant.(6)semm levels of Urea and Creatinine:The levels of urea decreased in all treated groups exceptgroup II (exposed to 2 g/rrr') which showed an increase in urealevel. The levels of creatinine also decreased non significantly inall treated groups.(7) seurm level of cholinesterase :Seurm levels of cholinesterase were non significantly highin all treated groups compared to control one.(8) serum levels of immunoglobuline G (IgG) :Immunoglobuline G (IgG) showed a non significantdecline in all treated groups compared to that ofthe control.(9) semm level of corticosterone:Serum levels of corticosterone showed marked andsignificant increases in all treated groups compared to that of thecontrol one.(10) serum levels of thyroid honnones :The levels of thyroid hormones were affected significantlywith unleaded gasoline vapor inhalation but in a condradict wayi.e., although the levels of thyroxine increase the levels oftriiodothyronine decrease in all treated groups compared to thecontrol one.(II) serum levels of testosterone:Serum levels oftestosterone were decrease significantly inall treated groups compared to that of the control one.(121 Hisotpathological examinations:The results of the present study showed that unleadedgasoline vapor inhalation induced marked histologicalalterations in lung, trachea, brain and testicular tissues. Thesealterations -were more apparent in group III (high dose); butwere also evident in group II (mid dose) and were mild in groupI (low-dose).from this study, it is concluded that, unleaded gasolinevapor inhalation is very harmful to health and it is veryimportant to avoid exposure to gasoline and its additives. It isimportant to conduct studies about more save additives forhuman health.