

Evaluation of heavy metal levels in serum of Wistar rats exposed to engine oil

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ABSTRACT

Purpose: Data are available that indicate there is an elaborate elemental constitution of petroleum products, with identified elements contained in the many products being additive (e.g. Ca, Zn and P) as well as wear metals (e.g. Ag, Al, Ba, Cd, Cr, Cu, Fe, Mg, Mo, Na, Ni, Pb and Sn). In addition, incessant deliberate exposure of engine oil to both human beings and farm animals for therapeutic reason has been reported. Therefore, the objective of this study is to evaluate the levels of heavy metals in serum of engine oil-exposed rats.

Materials and methods: Thirty adult female rats were divided equally into 5 groups. The first and second groups were treated with engine oil by oral route (as contaminant of feed) at dosage levels of 0.5 and 1.0 mL/kg body weight respectively. The third and fourth groups received the test agent through the dermal route

at dosage levels of 0.5 and 1.0 mL/kg body weight while the fifth group served as the control. The duration of the study was 30 days, after which blood was obtained from each rat, centrifuged and the resultant serum used for the analysis of heavy metals by employing Atomic Absorption Spectrometry (AAS). Data were analyzed using analysis of variance (ANOVA), $p \leq 0.05$ was considered significant.

Results: Data obtained showed that there were significant differences in the levels of aluminium, silicon, cadmium, lead, arsenic, vanadium, and nickel.

Conclusions: These increases suggest that incessant exposure to engine oil may be dangerous and therefore constitute health hazard.

Keywords: Engine oil, oral and dermal routes, lead, cadmium, aluminum, silicon, vanadium, arsenic, nickel

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