Indian J Physiol Pharmacol 2012; 56 (2) : 184–185

LETTER TO EDITOR

ELEVATED BLOOD LEAD LEVEL DESPITE DISCONTINUATION OF LEADED PETROL

(Received on June 17, 2011)

Dear Editor,

Worldwide, lead (Pb) ranks as one of the most serious environmental poisons. Chronic lead exposure often does not result in overt manifestation of toxic symptoms but leads to slow, progressive and usually irreversible toxicity of hematopoietic, nervous, renal, gastrointestinal and reproductive system. Lead pollution due to its adverse effects on health remains a public health concern in developing countries such as India, where use of leaded petrol has recently been phased out. However, lead continues to be found in other sources like pipes carrying drinking water, paints, canned foods, glazed ceramics, herbal medicines, batteries, cosmetics, jewellery etc. Lack of awareness about the sources of lead and ill effects results in health hazards to many adults and children causing significant economic damage.

In this context, we refer to the letter to the Editor titled "Effect of environmental lead pollution on hemoglobin and erythrocyte ALAD activity" by Sharma et. al. published in Indian J Physiol Pharmacol 44(1): 117-118, 2000. The authors had conducted a study to examine the effect of lead exposure on blood indices of traffic policemen and reported a significantly higher Blood Lead Level (BLL) and decreased erythrocyte ALAD (Delta- aminolevulinic acid dehydratase) activity in traffic police personnel who were supposed to be exposed to higher vehicular pollution as compared to the control group. It is now over a decade that leaded petrol has been discontinued in India; therefore, we have once again examined the impact of discontinuation of lead containing petrol on BLL and related biochemical parameters in the normal population of Jaipur.

The present study comprises of 250 subjects, of which 141 were from rural and 109 were from urban background, 217 were male and 33 were female, ranging in age from 20 to 70 years. Fasting blood was collected from the antecubital vein in EDTA vial by taking all aseptic precautions. Blood was analyzed for erythrocyte ALAD activity (2) immediately and a small aliquot of blood was diluted with nitric acid - Triton X-100 solution and analyzed for BLL using atomic absorption spectrophotometer (3) by the same methodology as adopted by Sharma et. al. The results of our study are shown in the table below.

The mean BLL of 250 subjects in the present study was found to be 151.6±118.2 ng/ml. The urban population had a significantly higher ($P<0.001$) BLL (232.3±98.0 ng/ml) as compared to the rural population (89.3±71.8 ng/ml). A significantly decreased ($P<0.001$) erythrocyte ALAD activity (34.47±17.28) was observed in the urban population as compared to the rural

Table I: Biochemical characteristics of normal healthy subjects.

Parameters		*Total (n=250)*	*Rural (n=141)*	*Urban (n=109)*
Lead (ng/ml)	Mean±SD	151.6±118.2	89.3±71. 8	232.3±98.0
	Range	1.0–397.1	1.0–372.0	2.0–397.1
5-ALAD (U/L)	Mean±SD	37.89±16.33	40.53±15.10	34.47±17.28
	Range	6.63–78.23	8.60–77.56	6.63–78.23

population (40.53±15.10). The increased BLL in the urban population could be attributed to the continuous use or exposure to various sources of lead in day to day life. It is observed that 58.8% of the urban population was found to have BLL above 10 ug/dl (100 ng/ml) which is prescribed as the safe cutoff by WHO (4).

In the present study, the mean BLL of the urban population continues to be significantly higher (232.3±98.0 ng/ml) than the safe limit prescribed by WHO and is comparable with the findings of Sharma et al (275.9±53.4 ng/ml) reported more than a decade ago (1). This finding is quite surprising considering that it is now over a decade that leaded petrol has been discontinued in India. This indicates that, discontinuation of lead containing petrol alone could not improve the situation. There appears to be many environmental, occupational and nutritional factors responsible for lead pollution in the environment and elevated blood lead level. This is a matter of serious concern.

In view of this, it has been recommended that, we need to launch a mass education and awareness programme about the ill effects of chronic lead exposure, screen the population for BLL, monitor environmental lead level and develop methods to eliminate lead from various sources.

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REFERENCES

1. Sharma DC, Seervi N and Rawatani J. Effect of environmental lead pollution on haemoglobin and erythrocyte ALAD activity. Indian J Physiol Pharmacol 2000; 44(1): 117–118.
2. Nandi DL, Baker-Cohen KF, Shemin D. 5-aminolevulinic acid dehydratase of Rhodopseudomonas spheroids. I. Isolation and properties. *J Biol Chem* 1968; 213: 1224–1230.
3. Bishop ML, Duben-Engelkirk JL. Fody EP. Clinical Biochemistry, Principles, procedures, correlations. Philadelphia, Lippincott, 1992; 609–610.
4. W.H.O. Inorganic lead. Environmental Health Criteria No. 165, Geneva. W.H.O. 1995.