



RESEARCH ARTICLE

ASSESSMENT OF LEAD EXPOSURE, OXIDATIVE STRESS AND BIOCHEMICAL CHANGES IN AUTOMOBILE WORKERS

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ABSTRACT

Blood Zinc protoporphyrin (ZPP), serum total protein (TP) and total cholesterol (Tc) levels in automobile workshop workers in relation to lead toxicity were analyzed. In present study's automobile workshop workers. Has the mean value of BPb was 15.76 ± 0.33 mg/dl while control was 8.20 ± 0.15 µg/dl control group exhibited mean 11.5 ± 0.22 µg/dl. Workers exhibit significant Increase in BZPP corresponding to Increase in BPb level. TP levels in workshop workers showed significant decreased to controls but within reference range. Mean value of TP in workshop workers 6.9 ± 0.13 g/dl and 7.71 ± 0.18 g/l in controls. The serum total cholesterol level in workshop workers showed decreased compared to controls but within reference range. Mean value of TC in workshop workers 162.00 ± 3.44 mg/dl and in control was 172.86 ± 4.32 mg/dl.

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INTRODUCTION

Now a day's every human being adapt to comfort, every comfort keeps there is hard work because of only automobile work shop workers' one of the part in human being life. These people suffers so many complications from radiation for the manufacturing of thing of robotic equipments use selected few of parameters from automobile work shop workers they suffers lot of neurophysiologic problems and hyper cholestremia due to the oxidative stress in this conditions some of the elements also influence the physiological health problems from there automobile workshop workers mostly effects to some of parameters are abnormalities like Zn⁺, Pb, Co, Total protein, cholesterol, lipid peroxidation. They may indication to automobile workshop workers system neurophysiological problems.

MATERIALS AND METHODS

Zn⁺, by atomic absorption spectrophotometry
Total Proteins- biuret method
Total cholesterol – oxidase –peroxidase method
Protoporphyrin-chemiluminescence method

Carbon monoxide-by Hart ridge's reversion spectroscope
 $I_2O_5 + Co \rightarrow CO_2 + I_2$

Lead (Pb) → atomic absorption spectrophotometry

Lipid peroxidation → MDA Method

RESULTS

The values obtained on analyzing specimen collected from automobile workers and control group are tabulated. The mean values and standard deviation also have been calculated for comparative study of automobile workers and controls. The values of automobile workers and control groups are also graphically represented for comparison at a glance the graph were plotted using mean values of all the study. Parameters. Table I shows mean standard deviation and P values of all the study parameters in automobile workers and controls. The p value was used to compare automobile workers and control the p values <0.001 was considered significant level of Zn⁺, total protein, Total cholesterol, Pb, Proto MDA, Porphyrins, Co increased. Comparison of selected parameters mean values between automobile workshop workers and control.

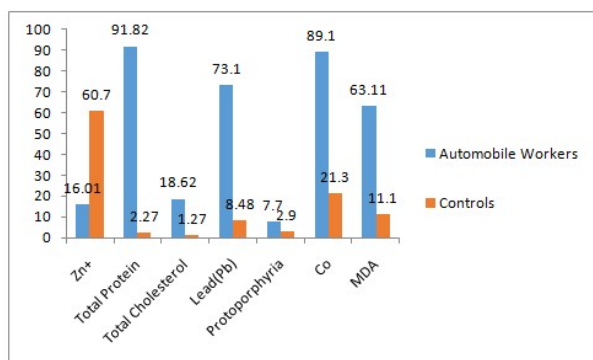


Figure 1. Comparison of selected parameters mean among Automobile workers and Controls

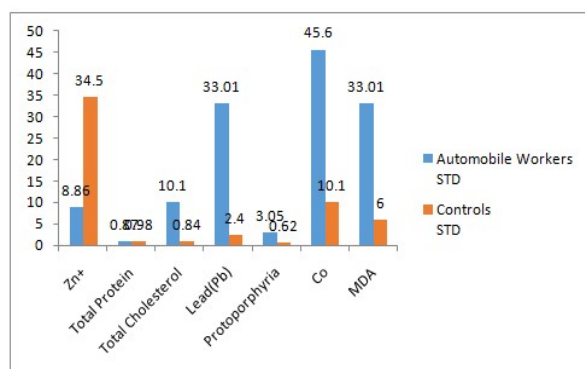


Figure 2. Comparison of selected parameters STD (Standard Deviation) among Automobile workers and Controls

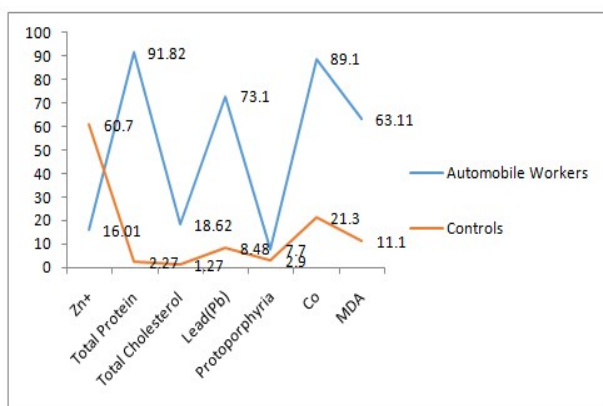


Figure 3. Scattered diagram Comparison of selected parameters mean among Automobile workers and Controls

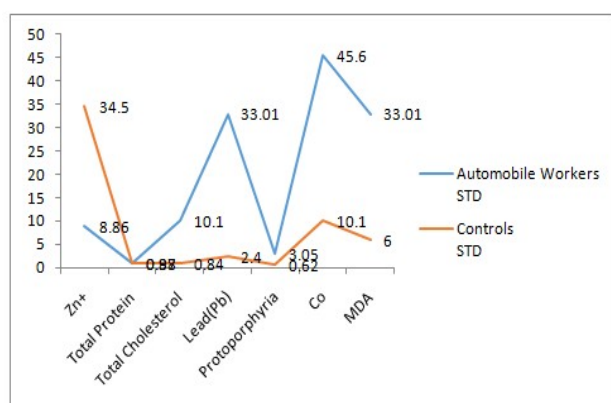


Figure 4: Scattered diagram Comparison of selected parameters STD (Standard Deviation) among Automobile workers and Controls

S.no	Parameters	Automobile workers		Controls		p value
		Mean	S.D	Mean	S.D	
1	Zn+	16.01	8.86	60.70	34.50	0.001
2	Total Protein	91.82	0.87	2.27	0.98	0.001
3	Total Cholesterol	18.62	10.10	1.27	0.84	0.001
4	Lead(Pb)	73.10	33.01	8.48	2.40	0.001
5	Protoporphyrin	7.7	3.05	2.9	0.62	0.001
6	Co	89.1	45.6	21.3	10.1	0.001
7	MDA	63.11	33.01	11.1	6.00	0.001

DISCUSSION

During workshop of employer they mostly effecting the radiation the radiation mostly effects the lowers the Zn+ absorption from intervene there is no ability to absorption of Zn+ leads to impairment of neurophysiological functions.¹ lead (Pb) highly toxic element it can competitively inhibits the Ferrochelataase leads to impairment of heme synthesis protoporphyrin is elevated through urine leads to there is no proper synthesis of mature heme. Pb&Co(carbon monoxide) both completely inhibits the protein synthesis & promote the oxidative stress leads to increases the MDA levels and Co also one of the factor for proneation of stress elevation. Lowers the Zn+ increases lead (pd) promote she synthesis of cholesterol leads to hyper cholestremia stress also can promotes the hypercholestremia. All above finding with regard to mineral status and above parameters indicates the profound influence the auto mobile workshop workers more effecting the stress anemiaprotoporphyrimia hyper cholestremia, low total proteins it indicate the neurophysiological effect.

CONCLUSION

The findings suggest that automobile workshop workers exposed to lead and carbon monoxide may experience alterations in mineral status, heme synthesis, protein metabolism, lipid metabolism, and oxidative stress. Reduced zinc status may contribute to impaired neurophysiological functions, while lead exposure may interfere with heme synthesis, resulting in increased protoporphyrin levels and a tendency toward anemia. Increased oxidative stress, reflected by elevated MDA, may further contribute to cellular damage and metabolic disturbances. Changes in total protein and cholesterol levels may also indicate alterations in protein and lipid metabolism. Overall, the study highlights the potential adverse effects of occupational exposure to lead and carbon monoxide among automobile workshop workers, emphasizing the importance of occupational safety measures, periodic health screening, and monitoring of relevant biochemical parameters.

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