

Effect of lead intoxication and thiamine deficiency on myelin compositions and seizure threshold in the rats.

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It was recognized that lead intoxication reduces thiamine content in the brain of rat and this change produces the alterations of thiamine-related biochemical reactions. In the present study, it was tested whether the changes of myelin composition as well as seizure threshold induced by lead intoxication in rats may be related to these changes of thiamine status and thiamine related biochemical factors. Wistar rats were divided into five groups: Control group, Lead-treated group, Lead plus Thiamine-treated group, Thiamine-deficient group, Pyriethamine-treated group. Each group was divided into three subgroups: 3, 7 and 16 week old group. Myelin protein and phospholipid, one of the compositions of myelin lipid, were measured in the myelin isolated from rat brain. Threshold of electric shock seizure was tested in each group. The amount of each myelin composition in lead-treated group and thiamine-deficient group was significantly lower than those of all the brains in control group, but recovery by supplementation with thiamine during lead intoxication was occurred only in the cerebellum of 3 week old animal. Thresholds of the electric shock seizure of lead treated group and thiamine deficient group in 3 and 7 week old rats were significantly lower than those of control group, while those of lead plus thiamine treated group were similar to those of control group.

These results may indicate that the change of thiamine status due to lead intoxication induces the changes of myelin phospholipid and myelin protein content in the cerebellum of 3 week old rats, which may eventually affect the threshold of seizure.