



# CHANGES IN BIOCHEMICAL INDICES OF RATS INTOXICATED WITH CARBON TETRACHLORIDE AND TREATED WITH L-GLUTAMIC ACID

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## Introduction

Carbon tetrachloride (CCl<sub>4</sub>) is a compound that was previously used as a dry cleaning solvent, manufactured chemical and does not occur naturally in the environment. Currently, CCl<sub>4</sub> is frequently used a well known model compound in preclinical experiments for xenobiotics-induced hepatotoxicity. Many research studies have demonstrated that CCl<sub>4</sub> intoxication is the major source of free radical generation in many tissues such as the liver, brain, kidneys, lungs, spleen and blood. One of the major defensive mechanisms against radical induced oxidative stress is antioxidant defense mechanism. L-glutamic acid is an ubiquitous amino acid present in the free form or bound to peptides and proteins. Therefore, the purpose of this study was to investigate the possible antioxidant effects of L-glutamic acid (L-Glu) on CCl<sub>4</sub> toxicity in tissues and blood of male rats.

## Results

The obtained results suggest that CCl<sub>4</sub> causes oxidative stress in rat tissues, accompanied by a change in the majority of biochemical parameters. Our studies have revealed an increase in lipid peroxidation under the effect of xenobiotic CCl<sub>4</sub> that was manifested by the increased content of lipid hydroperoxides ( $p < 0.05$ ) and thiobarbituric acid reactive substances ( $p < 0.05$ ) in most of the studied tissues. It was found that CCl<sub>4</sub> intoxication leads to decrease in the antioxidant enzymes activity. The enzymatic activity in tissues of rats treated with L-Glu was restored. Also, changes, which were observed in studied parameters showed up to be less significant comparing to CCl<sub>4</sub> treated group.

## Material & Methods

Studies were conducted on albino Wistar rats (males), weighing 200–220 g. The animals were fed with standart rat pellet feed and drinking water was provided *ad libitum* in clean polypropylene bottles with stainless steel sipper tubes. Rats were divided into three experimental groups. Animals from first and second experimental groups were intraperitoneally exposed to CCl<sub>4</sub>. After that rats from the second experimental group were treated with an aqueous solution of L-Glu. Rats of the control group were administered to the appropriate amount of saline.. The levels and activities a number of biochemical indicators were determined. Statistical evaluation of the results was performed using arithmetic mean and standard error ( $M \pm m$ ) and the variances between groups were tested for significance using one-way ANOVA. The differences were statistically significant at  $P < 0.05$ .

## Conclusions

L-Glu can be used as an effective therapeutic agent for the treatment of CCl<sub>4</sub>-induced tissues toxicity. It is recommended to investigate possible relations between antioxidant enzymes activity and lipid peroxidation content under the action of CCl<sub>4</sub> and the role of L-Glu in these processes in further studies.