

Molixan's Membrane Protective Properties in Case of Acute Ethanol Intoxication

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Abstract

Background: Acute ethanol intoxication is a life-threatening condition that causes neuro and hepatotoxic effects and clinically manifests with neurological and liver disorder symptoms [1-5]. In fact, medications used in clinical practice results in stabilization of neurological symptoms and vital functions, although the complete recovery of metabolic disorder is not observed and search for new effective medications is essential [6-9].

Aim: Is to evaluate and prove the efficacy of Molixan in the management of acute ethanol intoxication, to reveal its positive effects on main links of acute ethanol intoxication, to investigate molixans effect on 3 days survival, neurological status and some vital functions.

Methods: 340 male rats were used for this study. Modelling of acute ethanol intoxication was carried out using 40% aqueous solution of ethanol injected intragastrically in a dose of 1.5 LD₅₀ (12.0 g/kg). 0.3 molixan solution was injected intraperitoneally in adose of 30 mg/kg [8].

Results: Study results show positive effect of Molixan on hepatocytes' membranes' structural-functional state in acute ethanol intoxication [7,10]. The normalization of glycerol alkaline system, which is involved in glycerol lipids exchange, transfer of hydrogen ions to the mitochondria, and in the formation of energy in the cells is observed. The number of animals in coma state was decreased and stupor development and somnolentia time was prolonged after ethyl alcohol consumption [8]. Stable body temperature and heart rate was observed. Degree of CNS depression was less expressed.

Conclusion: Molixan is effective in the treatment of neurological and liver disorders which is associated with its membrane protective properties.

Keywords: *Molixan; Acute Ethanol Intoxication*

Background

Acute ethanol intoxication is the most common cause of chemical intoxications. It is a life -threatening condition that causes neuro and hepatotoxic effects and clinically manifests with neurological and digestive systems damage symptoms [1,7,8]. Treatment of alcohol intoxication consists of neuro and hepatoprotective medications. In fact medications used in clinical practice results in stabilization of neurological symptoms and vital functions, although the complete recovery of metabolic disorder is not observed and search for new effective medications remain essential [6,8]. In this regard efficacy of peptide origin medication, such as Molixan must to be examined for the management of critical condition associated with central nervous and liver disorders [6].

Aim of the Study

Aim of this study is: to evaluate and prove the efficacy of Molixan in the management of acute ethanol intoxication, to reveal its positive effects on main links of alcohol intoxication, to investigate molixan's effect on 3 days survival, neurological status and some vital functions.

Methods

This is an experimental study. 340 male rats were used for this study. Modelling of acute ethanol intoxication was carried out using 40% aqueous solution of ethanol injected intragastrically in a dose of 1.5 LD₅₀ (12.0 g/kg). 0.3 molixan solution was injected intraperitoneally in a dose of 30 mg/kg. Control group of animals received intraperitoneally sodium chloride solution with the same dose. Four schemes of medication administration were examined during study: Prophylactic (n = 20) once, 1 hour before the injection of ethanol. Treatment-and-prophylactic (n = 20) one hour before and immediately after injection of ethanol, then once daily for days. Delayed treatment (n = 20) after 30 minutes of ethanol injection, then once daily for 2 days.

In the second part of the study Molixan was compared with Semax a peptide origin medication with nootropic effect and Heptral, a hepatoprotective medication of non-peptide origin [8].

Results

Study results shows positive effect of Molixan on hepatocytes' membranes' structural-functional state in acute ethanol intoxication. At the same time the normalization of membrane phospholipid's qualitative and quantitative composition and their phylogenetically established correlations were observed [7,11,12]. As a result the normalization of ecto -5' nucleotidase, a marker enzyme of plasma membrane involved in lipid rafts' composition and participating in transfer of signal to cell, was observed. Molixan's administration in acute ethyl alcohol intoxication led to the correction of enzyme activity involved in final stage of glycolysis: Lactate dehydrogenase, and the concentration of its substrates, lactate and pyruvate [7,9,13,14].

Correction of hepatocellular functions

Correction of energy state of hepatocytes and normalization of NADH/NAD ratio is observed in all studied groups. Regulation of the ratio of reduced and oxidized forms of NAD, in turn, will ensure the normal course of NAD-dependent oxidative processes in hepatocytes. It was revealed that hepatocyte membranes' phospholipid spectrum deviations are mainly due to molixans; positive effect on the activity of phosphatidogenesis enzymes-glycerol kinase, cytoplasmatic and mitochondrial glycerophosphate dehydrogenase. The tendency can be seen in normalization of L-glycerophosphate, and the activity of glycerokinase, mitochondrial glycerophosphate dehydrogenase and the level of dihydroxyacetone phosphate are almost normalized [10].

These changes indicate the normalization of glycerol alkaline system, which is involved in glycerol lipids exchange process, transfer of hydrogen ions to the mitochondria, and consequently in the formation of energy in the cells [7,10].

Treatment of neurology symptoms

Molixan affects positively on neurological status of experimental animals irrespective of treatment scheme. The number of animals in coma state was decreased and stupor development and somnolentia time was prolonged after ethyl alcohol consumption. Stable body temperature and heart rate was observed. Degree of CNS depression was less expressed. Positive effect of Molixan on neurological status and vital functions of animals after alcohol intoxication increased their life expectancy substantially [8].

Conclusion

Based on the results of this study Molixan is effective in the treatment of neurological and liver disorder symptoms which is associated with its membrane protective properties. Above mentioned creates basis for Molixan's further study and application in medical practice.

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