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Treatment of acute methanol intoxications with ethanol and prolonged hemodialysis - experience from Vietnam Poison Control Center

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Objective: This study aimed to evaluate the effectiveness of the treatment protocol including administration of ethanol orally and prolonged hemodialysis (HD) in the management of acute methanol poisonings.

Methods: The study included 61 patients with acute methanol poisoning treated at Vietnam Poison Control Center, Bach Mai hospital from October 2016 to July 2018. The 20% solution of ethanol was infused through gastric tube in a loading dose of 4 ml/kg body weight, followed by a maintenance dose of 0,5 ml/kg per hour. The maintenance dose was 1 ml/kg/h in alcoholism patients and doubled in the patients underwent HD. Hemodialysis was performed for 8 hours used Receed filter with a surface area of 1.3 m². The plasma methanol and ethanol levels were determined by gas chromatography at the National Institute of Forensic Medicine in Hanoi.

Results: The mean of age was 46.7 ± 15.0 (range: 16 - 71) years, mostly in the age group of 40 - 59 years old (54.1%). 93.4% were male. The average plasma methanol concentration on admission of the patient was 126 mg/dL (maximal level was 569.7 mg/dL). The interval between ingestion of the methanol and the start of therapy was 38.3 ± 15.5 hours. After the first prolonged HD (8 hours), the average plasma methanol concentration decreased to 18.4 ± 14.1 mg/dl. 12 patients required the second hemodialysis. The plasma methanol concentration after the second hemodialysis was 6.4mg/dl. The average duration of ethanol therapy was 8.2 ± 2.2 hours with the total dose of 20% ethanol solution was 1297 ± 374 ml. The ethanol levels increased progressively during hemodialysis, although they varied considerably despite the similar treatment regimens. For therapeutic purposes, a blood ethanol concentration of 100 mg/dl was achieved after approximately 3 hours (3.4 ± 2.3 hours). The patients present severe metabolic acidosis on admission. After the first prolonged hemodialysis the metabolic acidosis was completely improved. The mortality rate was 32.8%. Very few patients had a complication of HD (bleeding at the catheter site) or adverse effects of ethanol therapy (vomit, agitation).

Conclusion: The study revealed the effectiveness and safety of the prolonged hemodialysis combined with administration of ethanol orally in the treatment of acute methanol poisoning.