

A study of role of parental magnesium therapy in reducing the symptoms in chronic alcoholics

Rajesh Enadle

Professor, Department of Medicine, Mallareddy Institute of Medical Sciences, Hyderabad, Andhra Pradesh, INDIA.

Email: enadle@gmail.com

Abstract

Hypomagnesaemia is common in alcoholic patients admitted to the hospital; in one study, for example, the prevalence was 30%¹. Excessive urinary excretion of magnesium occurred in 18 of the 38 patients with hypomagnesaemia. The defect in urinary excretion appears to reflect alcohol-induced tubular dysfunction that is reversible within 4 wks. **Aims and Objective:** To study the effectiveness of parenteral magnesium therapy in normalizing serum magnesium levels or evaluating the effectiveness in relief of alcohol related problems like acute intoxication and withdrawal syndrome. **Methodology:** 100 patients of alcoholism were selected for this study. All the above patients fulfilled the criterion for alcoholism given by DSM IV. Statistical analysis done by Student's "t"-test. **Result:** Serum magnesium levels on the 10th day after admission were 1.69±0.22 higher than on admission 1.54±0.25 and the difference was statistically significant (t=5.17; p<0.001). Patients who received magnesium therapy had slightly higher magnesium levels but the difference was not statistically significant (t=1.14; p>0.1). **Conclusion:** The rise in serum magnesium between patients treated on adequate diet alone and another treated with diet and parental magnesium was not significant on the 10th day but patient who was treated with parenteral magnesium showed clinically significant recovery in symptoms earlier than those treated with diet alone.

Keywords: Parenteral Magnesium therapy, Chronic Alcoholism.

*Address for Correspondence:

Dr. Rajesh Enadle, Professor, Department of Medicine, Mallareddy Institute of Medical Sciences, Hyderabad, Andhra Pradesh, INDIA.

Email: enadle@gmail.com

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INTRODUCTION

Hypomagnesaemia is common in alcoholic patients admitted to the hospital; in one study, for example, the prevalence was 30%¹. Excessive urinary excretion of magnesium occurred in 18 of the 38 patients with hypomagnesaemia. The defect in urinary excretion appears to reflect alcohol-induced tubular dysfunction that is reversible within 4 wks. of abstinence². This effect is modest and other factors contribute to hypomagnesaemia in these patients, including dietary deficiency, acute pancreatitis, and diarrhea. Magnesium deficiency manifests as dysfunction of central Nervous

System, neuromuscular transmission and muscular excitability. The causes of magnesium deficiency are many and most important of them are gastrointestinal, renal³, nutritional and endocrinal. Commonly reported signs and symptoms are hypokalemia and hypocalcaemia which contributes to the clinical picture-Lethargy, confusion, muscle twitching, tremors, muscle weakness, fasciculation, positive Chovestek's Sign⁴tetany, parasthesias, cardiac arrhythmias, apathy, depression, aggressiveness. And some rarely reported signs and symptoms:⁵ Hypomagnesaemia associated with chronic alcoholism Hirshfelder and Haury⁶ were amongst the first to describe magnesium deficiency in man. In their paper published in 1934 they showed the relation of hypomagnesaemia to muscular twitching, tremors and convulsions. In 1941, delirium tremens was treated empirically with magnesium sulphate given parentally with success⁷. It must be appreciated that the plasma magnesium concentration is the major regulator of magnesium reabsorption in the loop of Henle, the major site of active magnesium transport. An abrupt elevation in the plasma magnesium concentration will partially remove the stimulus to magnesium retention, and up to 50% of the infused magnesium will be excreted in the

urine. Furthermore, magnesium uptake by the cells is slow and repletion requires sustained correction of the hypomagnesemia⁸. In India about 10-15 percent population take alcohol and its use and abuse has been spreading in recent decades⁹. It has been shown that magnesium deficiency is primarily responsible for the pathogenesis of chronic alcoholism, complicated by delirium tremens¹⁰

MATERIAL AND METHODS

100 patients of alcoholism were selected for this study. All the above patients fulfilled the criterion for alcoholism given by DSM IV. Patients of alcoholism with ,Clinical picture of cirrhosis of liver with ascites and other sings of portal hypertension, Patient with hepatic encephalopathy, Patients with deranged liver function tests with high suspension of hepatic precoma, Patient with other major systematic illnesses like acute myocardial infarction, diseases of central nervous system, diabetes mellitus, other endocrine disease of central nervous system, diabetes mellitus, other endocrine disease and those on diuretic therapy were not included in this study Serum magnesium values determined by atomic absorption spectrophotometry. The normal range of serum magnesium level in our laboratory was 1.6 to 2.6 mEq/L, Statistical analysis done by Student’s “t”-test.

RESULTS

Table 1: Serum magnesium level on admission and hospitalization

Day of Admission	Serum Magnesium mEq/L Mean	SD	Difference
On admission	1.54	0.22	0.15
After 10 days	1.69	0.25	T=5.17; Diff=256, P<0.001

Serum magnesium levels on the 10th day after admission were 1.69±0.22 higher than on admission 1.54±0.25 and the difference was statistically significant (t=5.17; p<0.001).

Table 2: Serum magnesium levels on 10th day in patients given magnesium compared with patients on diet and vitamins

Type of Magnesium therapy	Serum magnesium mEq/L Mean	SD	Difference
Patients on magnesium therapy Group B	1.71	0.25	0.05 t=1.14
Patients not on not m magnesium therapy Group A	1.66	0.26	Diff=116 P<0.1

Patients who received magnesium therapy had slightly higher magnesium levels but the difference was not statistically significant (t=1.14; p>0.1).

DISCUSSION

In our study we found that parenteral magnesium therapy is useful in reverting the serum magnesium level back to normal level and Flink *et al*¹³. Commented upon the correlation between the *severity of illness* and the *magnesium concentration*. After estimating the serum magnesium levels on admission the patients were divided into two approximately equal groups (Table 2). Group A was put on a full hospital diet with vitamin supplements, which included 50-mg of thiamine given intramuscularly every day. Group B was given in addition to the above, injection magnesium sulphate 1 gm four times a day for 4 days and then 1 gm twice a day for next days serum magnesium was repeated in all on the 10th day, So the parenteral magnesium therapy group is having more serum magnesium level but the difference is not statistically not significant. Delman-Marsalet *et al* (1945)¹¹ and Flink *et al* (1956)¹² showed the relief of symptoms after administration of parenteral magnesium.

REFERENCES

1. Elisaf M, Merkouropoulos M, Tsianos EV: Pathogenetic mechanisms of hypomagnesemia in alcoholic patients. J Trace Elem Med Biol 9: 210-214,1995
2. De Marchi S, Cecchin E, Basile A: Renal tubular dysfunction in chronic alcohol abuse: Effects of abstinence. N Engl J Med 329:1927 -1934, 199
3. Zine L., Hill Vitamin unresponsiveness. Am. J. Clin. Nutrition 13:312, (1963).
4. Hanna S., Harrison M.T he syndrome of magnesium deficiency in man. Lancet. 172-175, July 23, (1960)
5. Belknap J. R., Berg J. N., Coleman R. R. The magnesium-deficiency tetany syndrome in man. The New England Journal of Medical 4:262,155-161, (1960).
6. Hirshfelder A.D., Haury V. G. Clinical manifestations of high and low magnesium. A. M. A. 102:1138, (1938).
7. Delmas-marsalet., Laton., Fauser. Treatment of Delirium Tremens with intravenous magnesium Sulfate. Rev Neurol., 73: 598, (1941).
8. ZALMAN S. AGUS, Hypomagnesemia, accessed on Sep. 2015, available at: <http://jasn.asnjournals.org/content/10/7/1616.full#sec-11>.
9. Ram Ahuja ,Social problems in India, 333 , (1992).
10. Chutkow J. G. Clinical Chemical correlation in the encephalopathy of magnesium deficiency, effect of reversal of magnesium deficits. Mayo Clinic. Proc. 49:244, (1974).
11. Delmas-marsalet., Laton., Fauser. Treatment of Delirium Tremens within travenous magnesium Sulfate. Rev Neurol., 73: 598, (1941).
12. Flink E.B. Magnesium Deficiency syndrome in man.J. A. M. A. 160:1406, (1956).
13. Flink E.B., Stutzman F.L., Anderson A.R. et al. Magnesium deficiency after prolongedparenteral fluid Administration and after chronic alcoholism complicated by Delirium tremens.

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