CORRESPONDENCE

# Effect of Magnesium Sulphate on Coagulation and Thromboelastographic Parameters in Chronic Liver Disease Patients

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Sir,

Liver disease patients have deranged coagulation due to various factors (decreased production of coagulation factors, thrombocytopenia, gastrointestinal bleed and blood transfusion). Because patients with the chronic liver disease used to have hypomagnesemia due to various reasons and studies on coagulation have demonstrated variable results comparing the effect of magnesium.[1] Thus, we evaluated the effects of intravenous magnesium sulphate on coagulation parameters in patients with chronic liver disease by thromboelastograph.

Hundred adult patients aged 18-65 years with chronic liver disease with hypomagnesemia were included in this study. The demographic profile and baseline thromboelastographic (R and K time, alpha angle maximum amplitude, G and LY 30) and laboratory parameters (serum magnesium, INR, aPTT, platelet count) were recorded. Patients were randomized in two groups (50 patients in each group): Intervention Group (Group M) and Control Group (Group N). In group M, 50 mg/kg magnesium sulphate in 100 ml of 0.9% saline and in group N, 100 ml of 0.9% saline was infused over 20 minutes. After 2 hours of intervention, serum magnesium levels and coagulation profile were repeated.

For discrete variables $X^2$ test, for continuous variables Student's t test and where the data was not normally distributed Mann-Whitney tests were used.

PT/INR, aPTT, platelet count was comparable in the two groups after magnesium supplementation. There was significant difference observed between the groups in term of TEG parameters after intervention. There was statistically significant decrease in K time (3.07 ± 1.02 Vs 3.95 ± 1.62 sec, P value <0.002) and LY 30 (1.79 ± 1.31 Vs 3.80 ± 2.19%, P Value <0.000) along with significant increase in MA (58.59 ± 8.6 Vs 53.89 ± 8.86 mm, P Value <0.008) and G value (8.98 ± 2.1 Vs 7.37 ± 1.49 Dyne/cm$^2$, P Value <0.000). There was improvement in R time and $\alpha$ angle but that did not reach statistical significance in Group M compared to Group N. Overall the CI did not differ in the two groups. CI in Group M and Group N was -1.46 ± 2.49 and -2.45±2.60 respectively (P value=0.18). Magnesium levels in Group M was statistically higher compared to Group N (1.82 ± 0.12 and 1.43 ± 0.17 mg/dl respectively) (P Value=0.000).

Conventional coagulation test PT and APTT do not represent the balance between the pro- and anticoagulant proteins because the PT and APTT are not sensitive to deficiencies of the anticoagulants. Coagulation in CLD is best assessed with viscoelastic measures of coagulation as it assesses all components of haemostasis. It is demonstrated that supplementing magnesium in liver transplant recipients leads to improvement in coagulation as measured by TEG.[2] Our study demonstrated the improvement in all TEG parameters but without statistically significance for R time, $\alpha$ angle and coagulation index.

As supplementation of magnesium sulphate in chronic liver disease patients may lead to improvement in coagulation profile as measured by viscoelastic parameters on thromboelastograph. Studies with emphasis on change in ionized serum magnesium and its effect on viscoelastic coagulation parameter in patients with liver disease are warranted.

## References

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2. Oralewska B, Zawadzki J, Jankowska I, et al. Disorders of magnesium homeostasis in the course of liver disease in children. *Magnes Res* 1996; 9:125-128.