Magnesium Infusion for Analgesia in Critically Injured Trauma Patients: A Randomized Controlled Trial

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Introduction
• Effective methods of multimodal pain control management are necessary, and multiple non-opioid regimens have been investigated
• Magnesium has been shown to reduce central sensitization through inhibition of calcium entry into cells by blocking NMDA receptors⁴
• Magnesium also reduces pain and opioid requirements postoperatively when used in conjunction with Vitamin C¹ and Ketamine³

Objective
Demonstrate the effectiveness of continuous, intravenous administration of magnesium sulfate in decreasing pain and opioid requirements in critically injured trauma patients when compared with placebo

Design/Sample
• Patients meeting inclusion criteria were randomly assigned into the magnesium sulfate or placebo group
• The magnesium sulfate group received a loading dose of 40mg/kg followed by a continuous infusion at a rate of 0.5 mg/hour (max duration: 24 hours)
• The placebo group received the same loading dose and infusion rate of normal saline
• Oral morphine equivalents (OMEs) and pain scores were recorded before, during, and after infusion
• Patients were monitored for possible adverse effects of magnesium, including bradycardia, dysrhythmia, respiratory depression and Richmond Agitation-sedation scale (RASS) of -3 to -5

Results
• 55 patients have been included in the study thus far (69% male, median age 49)
• Average Injury severity score (ISS) was 19.9 in Group A and 16 in Group B
• Average pain scores were lower for all three phases of infusion in Group A compared to group B
• Average OMEs for Group A were lower pre and during infusion compared to group B
• OME requirements between the two groups were nearly identical in the 24 hours post-infusion

Summary
• Despite having a higher average ISS, patients in Group A had lower average pain scores and OME requirements in the 24 hours prior-to and during infusion
• As the study is ongoing, blinding remains in place, so it is unknown whether Group A is receiving the magnesium sulfate or placebo
• With regards to adverse events, there has been 1 instance of brief respiratory depression in Group B; no adverse events have occurred requiring cessation of study drug

Next Steps
• Study accrual is ongoing (38% of total currently)
• Data will be unblinded upon max accrual for statistical analysis

References

Acknowledgements
I would like to thank Dr. Lauren Coleman and Dr. Christine Cocanour for including me in the study as well as fellow co-investigators, Dr. Gillian Hoshal, Jessica Duby, Jin Lee, and Gabby Echt.