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Magnesium Sulfate Versus Lidocaine as an Adjunct for Renal Colic in the Emergency Department: A Randomized, Double-Blind Controlled Trial

Marwa Toumia ¹, Sarra Sassi ², Randa Dhaoui ², Cyrine Kouraichi ², Khaoula Bel Haj Ali ², Adel Sekma ², Asma Zorgati ³, Rahma Jaballah ³, Hajer Yaakoubi ³, Rym Youssef ³, Kaouthar Beltaief ², Zied Mezgar ⁴, Mariem Khrouf ⁴, Amira Sghaier ⁵, Nahla Jerbi ⁵, Imen Zemni ⁶, Wahid Bouida ², Mohamed Habib Grissa ², Hamdi Boubaker ², Riadh Boukef ⁷, Mohamed Amine Msolli ², Semir Nouria ⁸

Affiliations

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Abstract

Study objective: We wished to determine whether the addition of magnesium sulfate (MgSO₄) or lidocaine to diclofenac could improve the analgesic efficacy in emergency department (ED) patients with acute renal colic.

Methods: In this prospective, double-blinded, randomized controlled trial of patients aged 18 to 65 years with suspected acute renal colic, we randomized them to receive 75 mg intramuscular (IM) diclofenac and then intravenous (IV) MgSO₄, lidocaine, or saline solution control. Subjects reported their pain using a numerical rating scale (NRS) before drug administration and then 5, 10, 20, 30, 60, and 90 minutes afterwards. Our primary outcome was the proportion of participants achieving at least a 50% reduction in the NRS score 30 minutes after drug administration.

Results: We enrolled 280 patients in each group. A 50% or greater reduction in the NRS score at 30 minutes occurred in 227 (81.7%) patients in the MgSO₄ group, 204 (72.9%) in the lidocaine group, and 201 (71.8%) in the control group, with significant differences between MgSO₄ and lidocaine (8.8%, 95% confidence interval [CI] [1.89 to 15.7], P=.013) and between MgSO₄ and control (9.9%, 95% CI [2.95 to 16.84], P=.004). Despite this, differences between all groups at every time point were below the accepted 1.3 threshold for clinical importance. There were no observed differences between groups in the frequency of rescue analgesics and return visits to the ED for renal colic. There were more adverse events, although minor, in the MgSO₄ group.

Conclusion: Adding intravenous MgSO₄, but not lidocaine, to IM diclofenac offered superior pain relief but at levels below accepted thresholds for clinical importance.

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