Magnesium Sulfate ($MgSO_4$) regimen for fetal neuroprotection in pregnant women at risk of preterm birth: a Network Meta-analysis

Principal Investigator: May Flor B. Juruena, MD
Supervising Investigator: Lucia Tiangco, MD
Philippine Children's Medical Center

BACKGROUND

The need to determine the proper $MgSO_4$ treatment regimen that would offer effective neuroprotection for preterm fetuses with the least side effect to both mother and neonate.

METHODOLOGY

A searched electronic databases and reference list review by two authors A randomized clinical trials of $MgSO_4$ at different dosages and durations and retreatment among women <34 weeks gestation. Both maternal and neonatal primary and secondary neonatal outcomes were analyzed. STATA MP-Parallel Edition Statistical Software, Version 18. and summarize the pairwise effects of interventions. A random effects model (REM) network meta-analysis was conducted in a Bayesian framework.

Keywords: Cerebral Palsy; Magnesium Sulfate; Network Meta-Analysis; Neuroprotection; Preterm

RESULT

A total of 15 eligible clinical trials. In terms of $MgSO_4$ dosage and primary neonatal outcome of cerebral palsy and secondary neonatal outcome of intraventricular hemorrhage, a 5–6 grams loading dose with 2-grams maintenance dose (OR=0.55, 95% CI=0.36–0.83, p=0.004 and (OR=0.54, 95% CI=0.35–0.82, p=0.004, respectively) decreased the likelihood of moderate-to-severe cerebral palsy and in reducing the odds of grade 3 to 4 IVH. Considered the best treatment based on SUCRA. For APGAR <7, the best treatment was a loading dose of 5–6 grams with 2-grams maintenance dose (SUCRA=79.60%). In terms of $MgSO_4$ duration and primary neonatal outcomes, a 12-hour infusion (OR=0.57, 95% CI=0.38–0.85, p=0.006) decreased the odds of moderate-to-severe cerebral palsy and highest SUCRA of 81.80%.

Maternal outcome showed an increased likelihood of maternal flushing and redness in almost all MgSO4 dosage intervention.

CONCLUSION

There is sufficient evidence showing that a 5–6 grams loading dose with 2-grams hourly maintenance dose for a 12-hours to 24-hours reduced likelihood of moderate-to-severe cerebral palsy and intraventricular hemorrhage.