



Racial/Ethnic Disparities in Magnesium Sulfate Neuroprotection: A Sub-Group Analysis of a Multicenter Randomized Controlled Trial



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BACKGROUND

Racial/ethnic disparities are a significant problem in perinatal medicine. The effect of race/ethnicity in the use of magnesium sulfate (MgSO₄) in pregnant women has not been studied.

OBJECTIVE

To analyze whether differences in maternal and neonatal outcomes exist according to race/ethnicity after MgSO₄ neuroprotection.

METHODS

Subgroup analysis of a multicenter randomized control trial (BEAM trial), where pregnant women at risk of preterm birth were randomized to MgSO₄ or placebo. For this study, non-anomalous singleton gestations were selected. Variables considered for analysis included: 1) Baseline data, 2) maternal outcome, 3) offspring outcomes consisting of neonatal complications, moderate/severe cerebral palsy, infant death, and magnesium cord blood levels. Baseline data was compared using chi-square and Kruskal-Wallis. Relative risks were compared with Breslow-Day test. Multifactorial ANOVA was performed to include an interaction term. When interaction was found significant, a subsequent analysis was performed only in the MgSO₄ group. A p-value <0.05 indicated statistical significance.

RESULTS

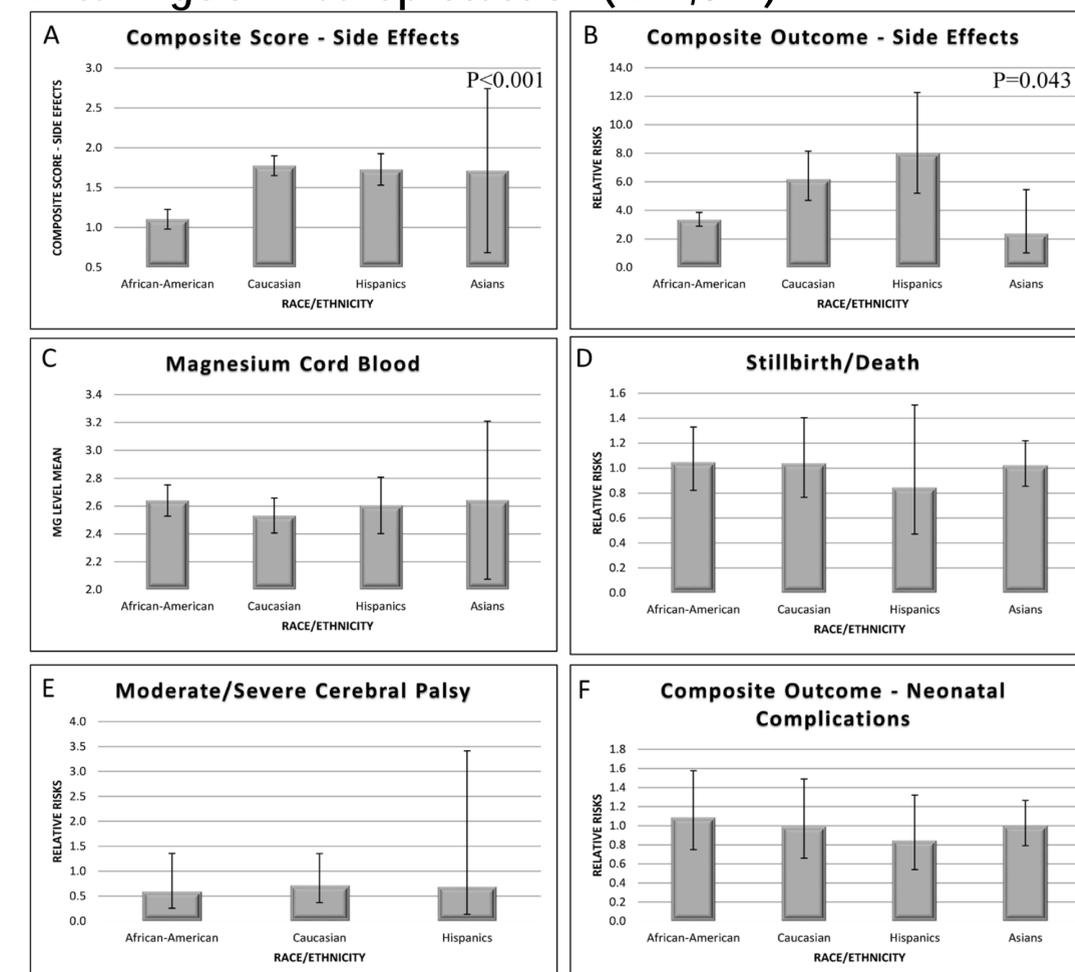
1,894 cases met selection criteria (922 received MgSO₄, 972 placebo); 45.0% were African-Americans, 36.2% Caucasians, 17.8% Hispanics, and 1.0% Asians (Table). Relative risks of the composite outcome of side effects was the highest in Hispanics [RR (95%CI) = 7.9 (5.2 – 12.2), p=0.043]. Subsequent analysis in the MgSO₄ group confirmed that Hispanics presented the highest frequency of side effects (Figure). The odds of side effects to MgSO₄ administration was also the highest in Hispanics [OR (95%CI) = 6.6 (1.3 - 33.8)].

Table . Risk of Side Effects to the Study Drug and Adverse Maternal Outcomes According to Maternal Race (N=1,894).

	African-American N = 852	Caucasian N = 686	Hispanic N = 338	Asian N = 18	p-value
	Relative Risks (95%CI)				
Side Effects					
Composite Outcome	3.3 (2.8 - 3.8)	6.1 (4.6 - 8.1)	7.9 (5.2 - 12.2)	2.3 (1.0 - 5.4)	0.043
Flushing	3.0 (2.6 - 3.4)	4.1 (3.4 - 4.9)	2.0 (0.9 - 4.3)	2.0 (0.9 - 4.3)	0.542
Sweating	2.1 (1.9 - 2.3)	2.1 (1.9 - 2.4)	2.6 (2.2 - 3.0)	2.1 (1.2 - 3.6)	0.425
Respiratory depression	1.0 (0.3 - 2.7)	2.0 (1.8 - 2.1)	2.1 (1.8 - 2.3)	N/A	0.268
Cardiac depression	N/A	N/A	N/A	N/A	N/A
Nausea	1.9 (1.7 - 2.2)	1.9 (1.7 - 2.2)	10.0 (6.0 - 16.6)	10.0 (6.0 - 16.6)	0.672
Arm pain	2.1 (1.9 - 2.4)	2.1 (1.9 - 2.4)	2.3 (1.2 - 4.2)	N/A	0.824
Other	1.6 (1.3 - 2.0)	1.5 (1.3 - 1.8)	1.9 (1.6 - 2.3)	N/A	0.32
Adverse Outcomes					
Pulmonary edema	2.0 (1.9 - 2.2)	1.3 (0.6 - 3.0)	2.1 (1.8 - 2.3)	N/A	0.444
Chorioamnionitis	1.0 (0.8 - 1.2)	1.1 (0.9 - 1.4)	1.3 (0.5 - 3.2)	1.3 (0.5 - 3.2)	0.519
Placental abruption	0.7 (0.5 - 1.0)	1.0 (0.8 - 1.2)	0.6 (0.3 - 1.4)	1.8 (1.2 - 2.9)	0.283
Endometritis	0.9 (0.7 - 1.2)	1.1 (0.8 - 1.6)	1.0 (0.7 - 1.4)	N/A	0.619

^a Breslow-day test.

Figure. Maternal Side Effects and Offspring Outcomes After MgSO₄ Neuroprotection (N=1,894).



(A) The interaction effect in the composite score of maternal side effects was statistically significant. (B) The relative risks of the composite outcomes of maternal side effects was the highest in (p=0.043). (C-F) The interaction effect in magnesium cord blood levels and infant outcomes was not statistically significant (P>0.05).

CONCLUSION

Hispanics showed increased risk of magnesium toxicity compared to other racial/ethnic groups. These results raise awareness of the existence of disparities in side effects of MgSO₄ used for neuroprotection.