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Emerging Birth Trauma Liabilities:

Using Magnesium Sulfate to Prevent Cerebral Palsy

Author: Donald Lenderman, Esquire

New theories of liability arise when formerly experimental or untested treatments are scientifically vetted and incorporated into standard practice. Physicians would do well to keep pace with new developments as they transform into proven therapies.

One current theory is the administration of magnesium sulfate before preterm birth to reduce the risk of cerebral palsy (CP). While this theory has been tested, it is not currently accepted as a proven therapy or "standard of care." The "obstetrical standard of care" is what a reasonable obstetrician of ordinary judgment, learning, or skill would do under the same or similar circumstances in a given case.

Scientific data have shown an apparent benefit (reduction of moderate or severe CP) for fetuses exposed to magnesium sulfate, but important questions remain unanswered. Three randomized controlled trials conducted in the past decade evaluated the fetal neuroprotective benefit of antenatal exposure to magnesium sulfate.[1,2,3]

Meta-analysis of pooled results from the three trials revealed magnesium sulfate exposure did not significantly affect the primary outcome (death or moderate or severe CP at or beyond two years of corrected age). However, a secondary outcome (moderate or severe CP) occurred less frequently in the group exposed to magnesium sulfate.[4] There is no consensus regarding inclusion criteria, optimal dosages, duration of exposure, gestational age for administration, or treatment regimen. This uncertainty prevents the creation of a standard of care for the use of magnesium sulfate for CP prevention. Until additional studies can identify a safe, therapeutic standard for magnesium sulfate use, arguably no standard of care exists.

Prevention of CP has been, and will continue to be, an important goal. However, the means to achieving that goal remain unclear. ACOG's official opinion on the subject is found in Committee Opinion No. 455: "Magnesium Sulfate Before Anticipated Preterm Birth for Neuroprotection." This opinion was first released in March 2010 and reaffirmed in 2013.

It is noteworthy that ACOG's official opinion took the form of a committee opinion rather than clinical management guidelines contained in a practice bulletin. The implication is that clinicians have not yet derived clear recommendations regarding the optimal use of magnesium sulfate. The committee opinion does, however, acknowledge the conclusions of the above-noted trials, stating: "The available evidence suggests that magnesium sulfate given before anticipated early preterm birth reduces the risk of cerebral palsy in surviving infants."

The committee opinion further states, "Physicians electing to use magnesium sulfate for fetal neuroprotection should develop specific guidelines regarding inclusion criteria, treatment regimens, concurrent tocolysis, and monitoring in accordance with one of the larger trials." Physicians are well advised to keep abreast of the development and dissemination of such guidelines; they may create a new standard of care in the future.

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[1]Crowther, CA, et al. Effect of magnesium sulfate given for neuroprotection before preterm birth: a randomized controlled trial. JAMA 2003; 290:2669-76.

[2]Marret, S, et al. Magnesium sulfate given before very preterm birth to protect infant brain: the randomized controlled PREMAG trial. BJOG 2007; 114:310-8.

[3]Rouse, DJ, et al. A randomized, controlled trial of magnesium sulfate for the prevention of cerebral palsy. N. Engl. J. Med. 2008; 359:895-905.

[4]Doyle, LW, et al. Magnesium sulfate for women at risk of preterm birth for neuroprotection of the fetus. Cochrane Database of Systematic Reviews 2009, Issue 1.

DONALD LENDERMAN is a Principal at Kitch, Drutchas, Wagner, Valitutti & Sherbrook, where he is a member of the Birth Trauma Team and National Coordinating Counsel Team. For more than 40 years, The Kitch Firm, with nearly 1 attorneys and six offices in the Great Lakes region, has been committed to meeting the legal needs of healthcare providers nationwide.

Ob-Gyn Risk Alliance
Underwritten by ProAssurance
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100 Brookwood Place
Birmingham, Alabama 35209

PO Box 590009
Birmingham, AL 35259

ObGynRiskAlliance.com