Clinical & Refractive Optometry CRO ONLINE CE A CE JOURNAL FOR OPTOMETRY

Resnick S. A Personal Neuroophthalmologic Lesson. *CRO Journal*. Published online April 3, 2023. doi:10.57204/001c.74025

Editorial

A Personal Neuroophthalmologic Lesson

Susan Resnick, OD,FAOO,Dipl[1]

[1] CRO(Clinical and Refractive Optometry)Journal, Editor in Chief

Keywords: Magnesium Sulfate, neuroopthalmologic exam, Labetalol, pre-eclampsia

https://doi.org/10.57204/001c.74025

CRO (Clinical & Refractive Optometry) Journal

On March 10, 2023 at 2:00 pm, I was blessed with the birth of my second grandchild, a little girl born at 37 weeks weighing 4 lbs.14 oz. Being present during her delivery and cutting the cord was an absolute thrill. All went well and mom (my daughter) and baby are doing fine after hospital discharge 4 days post natural delivery.

My daughter, having been treated with oral Labetalol beginning in her sixth month of pregnancy for chronic hypertension (pre-eclampsia), continued to exhibit blood pressure spikes post post-delivery with systolic pressures consistently above 140 mm. Intravenous magnesium sulfate was begun in the late afternoon on the second day after delivery. The plan was to treat her with the medication for 24 hours and then reassess her blood pressure.

Upon my arrival at the hospital on the morning of Day 3, my daughter's first words to me were "I feel like I'm drunk." She described an overwhelming sense of fatigue (greater than just "new baby lack of sleep") in addition to visual blur at all distances. She also reported intermittent diplopia. Her question to me: "Is this normal"? Wondering to myself whether she had been adequately informed of the potential side effects by the hospital personnel, I immediately dismissed my musings in order to try to help. As her "Momtometrist" I quickly engaged my mobile device to refresh my memory regarding the ocular side effects of magnesium sulfate. (Actually, I confess that I don't believe I was ever aware of them).

Here is what I learned. Magnesium sulfate has a long history of use in both severe antenatal and postnatal hypertension (pre-eclampsia and eclampsia). Preeclampsia is a disorder that only occurs in pregnant and postpartum women. It is characterized by the new onset of hypertension and signs and/or symptoms of end-organ dysfunction (such as injury to the kidneys, liver, platelets, lungs, brain) diagnosed after 20 weeks of gestation. Hypertension is diagnosed when there is a persistent elevation in the systolic blood pressure ⩾140mmHg and/or diastolic blood pressure ⩾90 mmHg.[1]

Magnesium prevents or controls convulsions (eclampsia) by blocking neuromuscular transmission and decreasing the amount of acetylcholine liberated at the end plate by the motor nerve impulse. When used judiciously it effectively prevents and controls the convulsions of eclampsia without producing deleterious depression of the central nervous system of the mother or infant.[2] Magnesium also increases the effectiveness of all antihypertensive drug classes. (Oral magnesium acts as a natural calcium channel blocker, increases nitric oxide, improves endothelial dysfunction, and induces direct and indirect vasodilation.)[3]

Contraindications to magnesium sulfate include: myocardial damage, diabetic coma, heart block hypermagnesemia and hypercalcemia. It is not administered during the 2 hours preceding delivery for mothers with toxemia of pregnancy. Caution is advised in patients with renal impairment and neuromuscular disease. It is labeled as Pregnancy Category D and should not be administered longer than 5-7 days (off-label) for treatment of preterm labor. While fetal skeletal demineralization, hypocalcemia, and hypermagnesemia are reported with continuous long-term use, it is deemed safe for lactation.[4]

Serious adverse effects of iV magnesium sulfate are rare with proper administration and monitoring. Monitoring should include blood pressure, respiratory rate, heart rate, and urinary output. Signs of toxicity include hypotension, nausea, vomiting, confusion, muscle weakness and respiratory depression. The less serious, more commonly reported side effects are flushing, drowsiness and visual changes.[5]

Clearly, (or at that point not so clearly) my daughter's misery revolved around the ocular side effects. Indeed, a study published in Obstetrics and Gynecology of 13 women undergoing bedside neuroophthalmologic during IV magnesium sulfate treatment revealed that blurred vision was present in 12 and diplopia in 10 of the patients, respectively. Findings also included ptosis, accommodative and convergence insufficiency, and abnormal pupillary responsiveness to light and near. All patients were symptom-free and had normal examinations after magnesium sulfate was discontinued.[6]

While my daughter was in no mood for me to perform a formal neuroopthalmologic exam, gross observation revealed reduced convergence and accommodation and sluggish ocular motility. The good news, however, is that just like the women in the above study, she was totally symptom free a short time after the IV was discontinued late in the afternoon of Day 3. Both she and my granddaughter were discharged the following day. Both are healthy, and one is happy and tired. But fortunately, this time the fatigue is clearly due to "mommy hood".

Submitted: March 29, 2023 EDT, Accepted: March 29, 2023 EDT

REFERENCES

1. https://www.uptodate.com/contents/preeclampsia-beyond-the-basics

2. https://www.drugs.com/pro/magnesium-sulfate.html

3. Houston M. The role of magnesium in hypertension and cardiovascular disease. *J Clin Hypertens (Greenwich)*. 2011;13(11):843-847. doi:10.1111/j.1751-7176.2011.00538.x

4. https://reference.medscape.com/drug/mgso4-magnesium-sulfate-344444#4

5. https://medinfogalway.ie/ivguides/magnesium-sulphate-intravenous-adults

6. Digre KB, Varner MW, Schiffman JS. Neuroophthalmologic effects of intravenous magnesium sulfate. *Am J Obstet Gynecol*. 1990;163(6 Pt 1):1848-1852. doi:10.1016/0002-9378(90)90763-w