

Intrapartum Hypomagnesemic Tetany: A Manifestation of an Ignored Element

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Respected Editor,

We came across a very interesting case of intrapartum hypomagnesemic tetany, which encouraged us to go into the biochemistry of this usually forgotten mineral and understand the essential role it plays in the normal physiology of pregnancy. I would hence like to share this acquired information and highlight the need to monitor and supplement magnesium during routine antenatal period.

A 30-year-old fullterm primigravida was admitted for pain in abdomen. She was a registered patient with no comorbidities and was regular in taking her routine antenatal supplements [including calcium carbonate (1000 mg

daily]. After 4 h of active labor, she suddenly started feeling tingling sensation in the oro-facial region along with bilateral carpopedal spasm. She did not have history of any similar episode in the past. The attending neurologist gave empirical calcium gluconate therapy (loading and maintenance) after ordering the routine blood investigations i.e. serum calcium and electrolytes (Na^+ , K^+ , Cl^-). No relief was documented in regard to the spasm. Blood investigations revealed normal serum calcium level (11.0 mg%) and electrolyte levels ($\text{Na}^+/\text{K}^+/\text{Cl}^-$ —132/3.7/99 mEq/L). The calcium gluconate infusion was stopped. The same blood was subjected to further testing including serum magnesium, liver and renal function tests. The laboratory results reflected low serum magnesium—1.4 mg% (normal—1.8–2.4 mg%). Loading dose of 4 g magnesium sulfate was immediately administered followed by 2 g given on day 2. Improvement in symptoms was seen within 5 min of infusion. No uterine tetany was observed, during this episode, which lasted for 30 min. A vacuum-assisted vaginal delivery was done. Normal serum magnesium was documented before discharge.

The final diagnosis was made as hypomagnesemia-induced tetany, as no other causative factor could be identified and magnesium therapy improved the patient's symptoms. She was asymptomatic postdischarge and was thoroughly evaluated for other causes of hypomagnesemia. Her serum magnesium levels 6 weeks postpartum were normal—1.8 mg%, without supplementation, reinforcing that the reduced levels were related to the pregnant state only.

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Magnesium is the second most abundant intracellular cation and is regulated by the kidneys. Its deficiency is prevalent in 10% of hospitalized patients. It is severely under diagnosed as is asymptomatic and unsought for. Magnesium deficiency is common in women of child bearing age. Moreover, its need increases during pregnancy i.e. pregnancy is a hypomagnesemic state. Trimester specific normative ranges are defined [1]. Its levels remain stable till 33 weeks of gestation, after which they start declining.

Magnesium has many important physiological roles. It causes cerebral vasodilatation, thereby reducing convulsions associated with vasospastic etiology, providing cerebral protection in preeclamptic patients. It plays an important antithrombotic role. Its deficiency is associated with transient rise of intrapartum blood pressure and is a risk factor for preeclampsia [2]. Depressed levels have been found in preterm labor [3] (levels < 1.4 mg% are used as a marker for true preterm labor). Its deficiency has been found accountable for recurrent abortions and hyperemesis gravidarum.

Pregnant women must increase their intake of magnesium-rich food like seeds, beans, nuts, green leafy vegetables etc., and receive 240–480 mg/day of magnesium [4]. They will have fewer premature births, small for date newborns and intrauterine growth retardation. Magnesium sulfate therapy during preterm labor decreases the incidence of moderate-to-severe cerebral palsy.

At the same time, empirical magnesium sulfate therapy has adverse outcomes. Neonatal hypermagnesemia leads to respiratory depression, low APGAR scores, arrhythmias etc.

Conclusion

Hypomagnesemia is a rare complication; hence, it may not be feasible to screen all antenatal women for magnesium levels. However, instituting prophylactic supplementation may prevent such episodes. Further research is necessary to identify the risk factors of hypomagnesemia in pregnant women.

Compliance with Ethical Standards

Conflict of interest There is no conflict of interest involved in view of the content/authorship of this manuscript.

Human and Animal Rights Statement There was no research done involving human participants and/or animals.

Informed Consent Informed consent of the patient was taken before each and every step of evaluation and management.

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