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# Hypermagnesemia, Maternal Quadriparesis and Encephalopathy - a case report

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# BACKGROUND

- Incidence of seizures in pregnancy 1 % [1]
- Eclampsia - most common cause in high income nations [2].
- Initial Rx and prophylaxis is  $MgSO_4$  (3), for prevention of recurrence, unless other causes, e.g. pre-existent epilepsy, are already known.

# Mechanism of action of MgSO<sub>4</sub>

- Not entirely known.
- Protection of BBB, vasodilatation of cerebral arteries, reversal of inflammatory processes in the CNS, (NMDA) receptor antagonism - theories proposed [4].
- Also provides foetal /neonatal neuroprotection
- Hypermagnesemia can cause muscle weakness, respiratory depression, hypotension and cardiac arrest.

# Case History

- 28 / Female
- G2P2L1A0
- PIH in 1<sup>st</sup> Pregnancy - FTND.
- Second pregnancy - Pre-eclampsia at 24 wks.
- Rx- Labetalol / Nifedipine-R / Aspirin- Uneventful with controlled HTN till 32 weeks

# Case History

- At 32 wks- Diffuse Abdominal pain , intractable vomiting.
- BP- 250/150 mmHg, PR-120/min. SpO2 96% RR- 20/min
- Rx- IV Hydralazine and PO Labetalol. LD - IV MgSO4 - 5 gm.
- 4 hours later, BP-persistently high , Emergency LSCS done- 1.4KG baby delivered.
- BP medications / IV MgSo4 -infusion Continued.
- 24 hrs post LSCS, GCS -11/15. Unable to move all extremities. Power - 0/5, absent DTR

MRI BRAIN- Normal Study

USG ABDOMEN-

1. Bilateral mildly bulky kidneys with grade I renal parenchymal changes.
2. Mild right pleural effusion.
3. Uterus is involuting phase. No retained products of conception

Parameters	D1/ D2	D3/D4	D10
Hb (g/dl)	11/ 6.7	8.6/9	10.8
Platelets (/cumm)	0.8/ 1.17	1.4/1.5	2.5
TC (/cumm)	9000/24000	15000/14000	9000
Creatinine (mg/dl)	1.1/ 3.3	3.8/4.4	1.02
Urine analysis	1+ protien/ 3-4 RBCS/hpf	Protein traces/ 1-2 RBCS/hpf	Protein traces/ 1-2 RBCS/hpf
Na (mmol/L)	136/138	133/131	140
K (mmol/L)	4.3/ 5.1	3.2/4.3	4
<b><u>Mg (mmol/L)</u></b>	<b><u>- / 13.2</u></b>	<b><u>7.49/2.85</u></b>	<b><u>1.8</u></b>
T Bilirubin (mg/dl)	2.7/ 5.9	3/1.26	0.8
SGOT /SGPT (U/L)	1538/912/750/802	357/517/157/359	18/10
APTT/INR	55/ 1.94	31/1.1	1



# Treatment given

- IV Calcium gluconate to prevent cardiac arrhythmias
- IV Saline / IV diuretics
- Emergency conventional Hemodialysis - lead to dramatic recovery.
- Followed by 2<sup>nd</sup> HD session - lead to Complete clinical recovery

# Discussion

- Case - highlights important aspects of MgSo4 use in eclampsia/ pre- eclampsia
- It has been demonstrated in an earlier case report how drug labelling can also inadvertently lead to magnesium toxicity<sup>5</sup>.
- Shows how rapidly changing clinical condition , can lead to lethal concentrations of drug ,even in clinically recommended doses.
- Initial mild AKI -HELLP( D/D- Sepsis/AFLP/TMA), rapidly worsened over few hours leading to toxic concentrations of MgSo4 resulting in the clinical picture.

# Differential Diagnosis

- Altered sensorium- PRES, CVA- CVT, ↓NA or ↑NA.
- Quadriparesis- ↑K or ↓K- were initially ruled out
- Magnesium is one such cation which can cause both neurological symptoms and muscle weakness
- Hemodialysis - useful in this critical state- can dramatically change outcomes

# Learning Points for the internist

- **MgSo<sub>4</sub>** useful but potentially dangerous, rarely leading to life threatening complications.
- **Close monitoring** may guide clinicians towards appropriate use
- In appropriate clinical setting, **Mg<sup>+2</sup>** levels, should to be checked as it may lead to significant change in management decisions
- **Hemodialysis** can be life saving

# References

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