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## MgSO<sub>4</sub> FOR NEUROPROPHYLAXIS IN PRETERM BIRTH – CLINICAL AUDIT- RE AUDIT

DR ANUPAMA MARNAL B A SR  
JSS AHER, anupamamarnal27@gmail.com

POORNIMA M ASSOCIATE PROFESSOR  
JSSAHER, poornimam@jssuni.edu.in

SUMA K B PROFESSOR  
JSSAHER, kbsuma@jssuni.edu.in

SAHANA K ASSISTANT PROFESSOR  
JSSAHER, sahanak@jssuni.edu.in

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## Keywords

MgSO<sub>4</sub>, preterm, neonatal morbidity and mortality

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# MgSO<sub>4</sub> FOR NEUROPROPHYLAXIS IN PRETERM BIRTH – CLINICAL AUDIT- RE AUDIT

## **INTRODUCTION :-**

Preterm birth is the single biggest cause of neonatal morbidity and mortality. There has been no significant decline in preterm birth rate over last 10 year (7-10%)(1) . There has been a significant improvement in survival rate due to better NICU care . But the rate of disability in survivors were largely unchanged. The major long-term consequence of prematurity is a neurodevelopmental disability (2).According to WHO – antenatal corticosteroids , tocolysis , and MgSO<sub>4</sub> for neuroprotection significantly improve neonatal outcome .(1)

**METHODS-** This is a retrospective audit of all patients admitted with preterm labor with gestational age <34 weeks , between July 2020 to December 2020 in the department of OBG JSS Medical College Hospital Mysuru, a tertiary care hospital in Karnataka. MgSO<sub>4</sub> according to FOGSI guidelines(2) i.e 4 gm iv bolus over 20 minutes followed by 1gm/hour infusion for 24 hours or till delivery whichever is earlier was practiced at the center. The number of patients who received the regime were analyzed. Reasons for not being able to follow the recommendations were analyzed and measures were taken to correct it. Re audit was done again after one year for the period between July 2021 to December 2021. Changes in clinical practice were noted.

**RESULTS-** Total number of patients admitted with preterm labor with POG < 34 weeks between July 2020 to December 2020 was 48. Among these 11 IUD cases were excluded. 37 patients were eligible to receive MgSO<sub>4</sub> as neuro prophylaxis. But only 6 patients (16%) received the drug. 31 patients (84%) had not received the drug due to various reasons such as PROM with fetal distress, severe pre-eclampsia with complications or presented with advanced labor due to which they were delivered immediately and did not receive MgSO<sub>4</sub> . Lack of awareness about the need of MgSO<sub>4</sub> as neuro prophylaxis among labor room staff was also an

important factor. Detailed analysis of these cases and education the staff about the importance of neuro prophylaxis was done . Protocols to be followed in these patients were put up . Re-auditing was done again after one year with the patients admitted between July 2021 to December 2021. 54 patients were included in the re-audit of which 07 were IUD, and 47 were eligible for MgSO<sub>4</sub> prophylaxis. 43 patients (93%) were given neuro prophylaxis. 02 patients presented in 2<sup>nd</sup> stage of labor and were delivered within 30 minutes of admission, and 02 patients had APH due to abruption and needed emergency LSCS . These 04 patients (07%) did not receive MgSO<sub>4</sub>. Even though 100% coverage could not be achieved significant change in coverage was noted.

**DISCUSSION** - According to guidelines of WHO , FOGSI ,ACOG , RCOG(1,2,3,4) MgSO<sub>4</sub> for neuro prophylaxis in preterm labour <34 weeks is recommended to improve the neurological functions in preterm babies .It is strongly recommended up to 32 weeks and said to be beneficial up to 34 weeks . Antenatal corticosteroids, tocolysis and MgSO<sub>4</sub> for neuro prophylaxis significantly improve neonatal outcome .(1)

3 dose regimes were recommended by WHO .(1)

-4 gm iv 20% over 20 min followed by 1gm / hour infusion till delivery or for 24 hours whichever is earlier.

-4gm iv bolus single dose .

- 6gm iv over 30 min followed by 2 gm /hour infusion.

Basic facilities available in the center, staff to monitor the patients, cost of treatment and recommendations followed at the center may vary from place to place. There are insufficient evidence to recommend one regime over other .(3) Same dose regime applies for multiple gestations also . The need for a repeat dose if delivery does not happen within 24 hours needs further study.

Mechanism of action -Mg<sup>2+</sup> is a co-factor in > 300 enzymatic reactions. Essential for DNA, RNA, protein synthesis, and cell membrane stabilizer. NMDA receptor blocker & modulates Ca<sup>2+</sup> influx. Reduces extracellular glutamate and excitotoxicity of neuronal cells. Reduced Ca<sup>2+</sup> influx reduces cellular apoptosis. Anti-inflammatory and oxidative stress. Reduces pro-

inflammatory cytokines IL-6, TNF $\alpha$  -prevents neuronal cell death(4).

Side Effects – maternal hypotension, tachycardia. No difference in Intraventricular hemorrhage, periventricular leucomalacia, blindness, developmental delay, neonatal convulsions, or NICU stay.

Significant reduction in gross motor dysfunction and cerebral palsy .(5) Long-term outcome of the baby in the prevention of cerebral palsy, and motor neuron dysfunction depends on Mgso<sub>4</sub> prophylaxis. There is no alternative drug available for this indication. Neuronal dysfunction detected in the baby later has been the cause of litigation in many cases. This is an attempt to stress the importance of following standard guidelines. Education of staff about current recommendations, and setting up protocols to be followed helps a lot in improving the management.

**CONCLUSION:-**Formulation of protocols, formation of a dedicated team, and constant auditing to ensure adherence to protocol benefits the patient outcome.

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