International Journal of Contemporary Pediatrics
Diggikar S et al. Int J Contemp Pediatr. 2021 Apr;8(4):744-746
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20211088

Short Communication

Use of antenatal magnesium sulfate for neuroprotection: a survey of national practices

Shivshankar Diggikar*, Srikanth Kulkarni, Abhishek S. Aradhya, Praveen Venkatagiri

Department of Neonatology, Ovum Women and Child Specialty Hospital, Neonatal Unit, Banaswadi, Bengaluru, Karnataka, India

Received: 11 February 2021
Revised: 08 March 2021
Accepted: 09 March 2021

***Correspondence:**
Dr. Shivshankar Diggikar,
E-mail: shiv.diggikar@gmail.com

ABSTRACT

This web-based cross-sectional survey suggests that uptake of antenatal magnesium sulfate for babies<32 weeks is about 75.2% (67/89) of centres in India, more in private sector hospitals 53/66 (80.3%) compared to public sector hospitals 14/23 (60.8%). A written policy for managing babies<32 weeks is available in 62.9% of units. Adequate facilities were available in 94.3% of units to administer magnesium sulfate. Although there is adequate knowledge (89.8%) about the beneficial effects of antenatal magnesium sulfate, attitude, and practice seem to be the major hurdle in implementation.

Keywords: Magnesium sulfate, Neuroprotection, Survey

INTRODUCTION

India contributes 23%, the most to global prematurity annually, and has a high burden of cerebral palsy.[1,2] Antenatal magnesium sulfate given before preterm birth for fetal neuroprotection prevents cerebral palsy and reduces the combined risk of fetal/infant death or CP with number need to treat (NNT) 1 in 42 (neuroprotection trails) World health organisation endorses about the routine use of antenatal magnesium sulfate in babies less than 32 weeks. Despite recommendations from WHO and FOGSI5, the clinical application of this evidence-based strategy is not known.[3,4]

As there is no national registry on neonatal practices that can capture all centers across India, the data on the uptake of antenatal magnesium sulfate is sparse. Therefore, we aimed to know the practices of antenatal magnesium sulfate usage and its challenges across India through a survey.[5]

METHODS

In our survey, all potential participating centres of level 2 and 3 neonatal intensive care units in hospitals across India were listed from the National Neonatology Forum database.[6] This included both public and private sector hospitals. We then formulated a 15-part questionnaire using multiple-choice or dichotomous questions (www.surveymonkey.com).

We sent a mobile/email link of the survey to the lead clinicians (Neonatologist/Paediatricians, Obstetricians) of the eligible centres from December 2019 to February 2020. The lead clinician was contacted over the telephone if there was no response to e-mail reminders. Any data queries were resolved over the phone with the participants. Results were exported to Microsoft Excel and calculated the frequencies and percentages for all categorical responses. In the absence of state-wise cerebral palsy data, a heat map was generated based on the Infant mortality rate.

RESULTS

We contacted a total of 100 neonatal units, of which 89 (89%) responded. Nearly 76 (85.4%) level 3 units and 13 (14.6%) level 2 units participated in the survey. About 72 (80.9%) of the responder were either neonatologist/ paediatricians/fellow trainees in neonatology, and 17 (19.1%) were obstetricians. Amongst responses, 23 (26%) were from the public sector, and 66 (74%) were from the private sector. The average uptake of antenatal magnesium sulfate across all centres was recorded as 67 (75.2%), in the private sector, the uptake is about 80.3%, and in the public sector, about 60.8%. The uptake of antenatal steroids of>60% was in 62 (70%) of centres. A written policy to manage babies<32 weeks was available in only 56 (62.9%) of centres. About 80 (89.8%) centres responded that they were aware of the beneficial effects of magnesium sulfate.

The most common regimen used was as per recommendation from FOGSI5 in 80 (91%) centres. The most common complication encountered while administering as responded by obstetricians was hypotension 7/17 (41.6%), and about 1/17 (5.8%) had experienced serious incident (mortality) while administering the medication. Most of the centres, 54/89 (67%) responded that KAP (knowledge, attitude, and practice) was the major hurdle in implementing this as standard protocol. Other details of the survey are presented in Table 1.

Table 1: Highlights of the survey.

Survey question		Total N (%) n=89 (100%)	Public sector N (%) n=23(26%)	Private sector N (%) n=66 (74%)
Level of care.	Level 2	13 (14.6)	2 (8.7%)	11 (84.6%)
	Level 3	76 (85.4)	21 (91.3)	55 (73.6)
Admission rate of preterm <32weeks per annum	<200	46 (51.6)	6 (26)	40 (60.6)
	>200	43 (48.3)	17 (73.9)	26 (39.3)
Antenatal steroids uptake percentage >60%		62 (70)	14 (60.8)	48 (72.7)
Antenatal MgSO4 for Neuroprotection		67 (75.2)	14 (60.8)	53 (80.3)
Written policy for managing preterm <32 weeks		56 (62.9)	13 (56.5)	43(65.1)
Adequate Facilities and Monitoring to administer MgSO4		84 (94.3)	19 (82.6)	65 (98.4)
Knowledge on WHO endorsing MgSO4 for Neuroprotection		80 (89.8)	18 (78.2)	62 (93.9)

DISCUSSION

As with any other survey, the data presented here is subjected to recall bias and the knowledge of the responder's grade. We attempted to include major centres across most states (Figure 1) in our survey so that data will be representative of the whole country.

Most of the units had the knowledge about the neuroprotective effects of magnesium sulfate, but implementation was the hurdle, as stated in the survey. Another biggest hurdle that appears from the survey was concerns regarding hypotension with magnesium sulfate. Studies show that magnesium sulfate administration can lead to an adverse event (hypotension, oliguria, respiratory depression), resulting in stopping the treatment (NNH-1 in 40 overall, 1 in 30 for hypotension). However, this has not led to an additional risk of increased intensive care admissions or mortality in mothers.[3]

Although 94.3% of centres responded as having adequate facilities for administering the medication, but lack of human resources and knowledge to clinical translation gap was noted as a major hurdle for implementation.

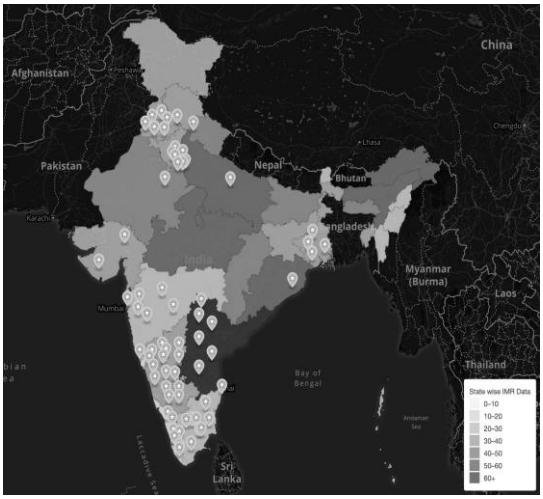

Figure 1: Geographic heat map depicting survey centers superimposed with infant mortality rate of 2017-sample registration system data.

Limitations

The number of obstetricians who participated in the survey was less than the neonatologist, who are primary decision-makers for the use of magnesium sulfate.

Similarly, more public sector hospitals contributed to the study than private sector hospitals. More centres responded in south India as compared to Northern India.[9,10]

CONCLUSION

This is the first survey to our knowledge on antenatal practices on the use of magnesium sulfate in India. Our survey showed that despite strong recommendations based on moderate-quality evidence, the use of antenatal magnesium is still not widely practised in India. There is an urgent need for national guidelines and quality improvement strategies for better clinical translation of the evidence on magnesium sulfate for fetal neuroprotection.

ACKNOWLEDGEMENTS

We thank Dr Lingaraj M., Dr Vimal K. (Neonatal Consultants Ovum Hospitals) for helping in collecting the data and Mr Vivek Chandrashekar, Associate manager, Accenture, Bangalore for generating geographic heat map.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Blencowe H, Cousens S, Oestergaard M, Chou D, Moller A, Narwal R. et al. National, Regional, and Worldwide Estimates of Preterm Birth Rates in the Year 2010 With Time Trends Since 1990 for Selected Countries. Obstetric Anaesthesia Digest. 2013;33(3):142.
2. Chauhan A, Singh M, Jaiswal N, Agarwal A, Sahu J, Singh M. Prevalence of Cerebral Palsy in Indian Children: A Systematic Review and Meta-Analysis. Ind J Pediat. 2019;86(12):1124-30.
3. Crowther C, Middleton P, Voysey M, Askie L, Duley L, Pryde P, et al. Assessing the neuroprotective benefits for babies of antenatal magnesium sulphate: An individual participant data meta-analysis. PLOS Med. 2017;14(10):e1002398.
4. WHO recommendation on the use of magnesium sulphate for fetal protection from neurological complications. Available at: http://extranet.who.int/rhl/topics/newbornhealth/who-recommendation-use-magnesiumsulfate-fetal-protection-neurological-complications. Accessed on 14 April 2020.
5. Fogsi.org. Available at: https://www.fogsi.org/wp-content/uploads/fogsi-focus/fogsi-focus-ptl.pdf. Accessed on 18 April 2020.
6. National Neonatology Forum Accredited Centres. Available at: http://www.nnfi.org/images/pdf/accreditation/NNFAccreditationAssessmentUndertakenasperRevisedLevelIIGuidelines.pdf. Accessed on 17 April 2020.
7. Nightingale Internet Reporting System. Vermont oxford network database of very low birth weight infants born in 2012. Burlington, VT: Vermont Oxford Network.
8. Wolf H, Huusom L, Weber T, Piedvache A, Schmidt S, Norman M et al. Use of magnesium sulfate before 32 weeks of gestation: a European population-based cohort study. Bio Med J Op. 2017;7(1):e013952.
9. De Silva D, Synnes A, von Dadelszen P, Lee T, Bone J, Magee L. Magnesium sulphate for fetal neuroprotection to prevent Cerebral Palsy (MAG-CP)—implementation of a national guideline in Canada. Implementation Science. 2018;13(1).
10. Burhouse A, Lea C, Ray S, Bailey H, Davies R, Harding H, et al. Preventing cerebral palsy in preterm labour: a multiorganizational quality improvement approach to the adoption and spread of magnesium sulphate for neuroprotection. Bio Med J Op Qual. 2017;6(2):e000189.

Cite this article as: Diggikar S, Kulkarni S, Aradhya AS, Venkatagiri P. Use of antenatal magnesium sulfate for neuroprotection - a survey of national practices. Int J Contemp Pediatr 2021;8:744-6.