Hannover Medical School
Department of Obstetrics, Gynecology and Reproductive Medicine

Medizinische Hochschule Hannover

PROMPT AND DRUG MANAGEMENT OF MG-SULFATE IN PET & TRANEXAMIC ACID IN PPH

S Papageorgiou[1], L Brodowski[1], H Lewinski[1], B Bohnhorst[2], M Flentje[3], C von Kaisenberg[1]

[1]Department of Obstetrics, Gynecology and Reproductive Medicine
[2]Department of Neonatology, Medical School of Hannover
[3]Department of Anesthesiology, Medical School of Hannover

Introduction

To determine if the introduction of PRACTICAL OBSTETRIC MULTI PROFESSIONAL TRAINING (PROMPT) at the Hannover Medical School made a difference in the application of Mg-Sulfate in Preeclampsia and of Tranexamic acid in Peri Partum Hemorrhage.

Methods

A retrospective and prospective observational cohort study of a 16 years period from 2004 to 2020: pre-training from 2004 to November 2017, post-training from November 2017 until January 2020. The study investigated the frequency of Mg-Sulfate application (bolus of 5g, maintenance 10g in 50ml/5ml/h) following the diagnosis of preeclampsia, severe preeclampsia and eclampsia. In addition, cases complicated with major obstetric hemorrhage and, in particular, the usage of blood products, clotting factors and tranexamic acid, were also compared.

Results

The number of documented pre-eclampsia cases showed a 50% increase from 57 to 91 per 10,000 births (p=0.002)

Pre-eclampsia	Group		Total
	Before	After	
No	27,043 (99.4%)	6,504 (99.1%)	33,547 (99.4%)
Yes	155 (0.6%)	60 (0.9%)	215 (0.6%)
Total	27,198 (100%)	6,564 (100%)	33,762 (100%)

The total cases complicated with severe pre-eclampsia and eclampsia remained unchanged. In detail, the cases with severe pre-eclampsia were slightly reduced, from 72/155 (46.5%) to 24/60 (40%). The cases with eclampsia were slightly increased, from 7/155 (4.5%) to 4/56 (6.7%) respectively, none of these changes were statistically significant.

Severe pre-eclampsia	Group		Total
	Before	After	
No	83 (53.5%)	36 (60%)	119 (73.04%)
Yes	72 (46.5%)	24 (40%)	96 (26.96%)
Total	155 (100%)	60 (100%)	215 (100%)

Eclampsia	Group		Total
	Before	After	
No	148 (95.5%)	56 (93.3%)	204 (94.9%)
Yes	7 (4.5%)	4 (6.7%)	11 (5.1%)
Total	155 (100%)	60 (100%)	215 (100%)

The administration of Mg-Sulfate increased significantly from 19/155 (12.3%) to 20/60 (33.3%) irrespective of the severity of preeclampsia. (P<0.001). Specifically, in severe pre-eclampsia cases we observed a higher proportion of Mg-Sulfate administration from 19/71 (26.76%) to 20/25 (80%), (p<0.001) and in eclampsia cases from 4/7 (57.14 %) to 4/4 (100%).

$MgSO_4$	Group		Total
	Before	After	
No	136 (87.7%)	40 (66.7%)	204 (94.9%)
Yes	19 (12.3%)	20 (33.3%)	39 (5.1%)
Total	155 (100%)	60 (100%)	215 (100%)

The diagnosis of major obstetric hemorrhage (PPH) showed a 2.5-fold increase from 24 to 52 per 10,000 births (p<0.001).

PPH	Group		Total
	Before	After	
No	27,133 (99.8%)	6,530 (99.5%)	33,663 (99.7%)
Yes	65 (0.2%)	34 (0.5%)	99 (0.3%)
Total	27,198 (100%)	6,564 (100%)	33,762 (100%)

The cases which required re-laparotomy and/or hysterectomy were significantly reduced from 12/65 (18,5%) to 1/34 (2.9%) (p=0.032) and from 8/65 (12.3%) to 0/34 (0%) (p=0.048), respectively.

Re-laparotomies	Group		Total
	Before	After	
No	53 (81.5%)	33 (97.1%)	86 (86.9%)
Yes	12 (18.5%)	1 (2.9%)	13 (13.1%)
Total	65 (100%)	34 (100%)	99 (100%)

Hysterectomies	Group		Total
	Before	After	
No	57 (87.7%)	34 (100%)	91 (83.3%)
Yes	8 (12.3%)	0 (0%)	8 (16.7%)
Total	65 (100%)	34 (100%)	99 (100%)

For the cases of PPH we observed a reduction in the number of blood units, platelets and FFPs administrated and a significant increase in the use of tranexamic acid (p=0.033), irrespective of the mode of delivery.

			N	Mean	Min	Max
Vaginal birth	Before	Blood loss (ml)	40	1,45	1,0	5,0
		Lowest Hb (g/dl)	40	6.8	5	10.7
		Units of blood	37	1.59	0	10
		Platelets	38	0.11	0	2
		FFPs	37	0.11	0	4
		Tranexamic acid	38	**0.16**	0	2
	After	Blood loss (ml)	31	1,42	1,0	2,30
		Lowest Hb (g/dl)	31	6.9	4.4	10.9
		Units of blood	31	1.52	0	8
		Platelets	31	0	0	0
		FFPs	31	0.35	0	9
		Tranexamic acid	31	**0.48**	0	2

			N	Mean	Min	Max
C-section	Before	Blood loss (ml)	25	1,86	1,0	4,00
		Lowest Hb (g/dl)	25	6.9	4.4	10.4
		Units of blood	21	5.29	0	20
		Platelets	21	0.48	0	2
		FFPs	21	3.38	0	32
		Tranexamic Acid	21	**0.33**	0	4
	After	Blood loss (ml)	3	1,17	1,0	1,50
		Lowest Hb (g/dl)	3	7.6	5.2	9.5
		Units of blood	3	0.67	0	2
		Platelets	3	0	0	0
		FFPs	3	0	0	0
		Tranexamic acid	3	**0.67**	0	2

Conclusions

The evaluation of blood loss and, as a result, the identification of major obstetric haemorrhage improved. This was reflected into the 2.5-fold increase in the documented cases with PPH following the PROMPT-Training in our unit, showing a better capability of the team to estimate the patients' blood loss.
The reduction in the number of blood units, platelets and FFPs administrated and, simultaneously, the increased use of tranexamic acid, were translated into a better knowledge of the team, a faster and more precise reaction to the emergency, and, thus, a better management following only 2½ years of training.

The implementation of PROMPT was associated, after only 2½ years, with a significant increase of Mg-Sulfate administration. While the incidence of pre-eclampsia following the introduction of PROMPT-Training increased, the percentage of eclampsia did not. Considering, the threefold increase of the administration of Magnesium Sulfate in severe pre-eclampsia cases from 26.7% to 80%, this outcome gives rise to the expectation that the PROMPT-Training will lead to further management improvements in the future.

Hannover Medical School
Department of Obstetrics, Gynecology and Reproductive Medicine
Carl-Neuberg-Straße 1,
30625 Hannover
spirospap21@hotmail.com
www.mh-hannover.de

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