

Research Article

Adjuvant Effect of Aortic Compression and Carbetocin Injection in Management of Primary Atonic Pph to Improve Outcome

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Abstract

Objective: Evaluating the adjuvant effect of aortic compression and carbetocin injection versus conventional management of primary atonic PPH to decrease blood loss, need for blood transfusion, need for further intervention and maternal morbidity.

Setting: Maternity Hospital Minia University.

Methodology: This retrospective observational study included 724 patients with GA between (37-42) weeks. Patients were allocated into four groups according to managed received. All patients received conventional resuscitative measures gp(1) received 100µg of carbetocin with aortic compression gp(2) received carbetocin injection the same dose listed above, gp(3) manual aortic compression gp(4) received conventional resuscitation.

Outcomes: mean blood loss, drop in hemoglobin, need for additional procedures, blood transfusion, duration of treatment and occurrence of complications.

Results: mean blood loss was lower in group (1) but with no significant difference between the other groups (735.2±332.93), (735.2±332.93), (992.2±341.46) (992.2±341.46) in group 1,2,3,4 respectively. A significant difference was noticed between the groups as regards drop in HB% group (1)1.226±0.367 (1.128±0.578) (1.380±0.997)(1.490±0.886) group 1,2,3,4 respectively, need for additional procedures, blood transfusion and duration of treatment and occurrence of side effects in favor of group I.

Conclusion: Carbetocin injection and aortic compression has adjuvant effect to rapid and long-term control of blood loss so can used together to save patient life and decrease complication of PPH.

Key words: PPH, Carbetocine, Aortic Compression, Conventional Procedures

Introduction

Primary postpartum hemorrhage (PPH) is the single largest contributor to maternal mortality worldwide. Hemorrhage accounts for 30% or more of all maternal deaths in Asia and Africa, most of which is PPH [1]. The incidence of PPH is high despite many women receiving uterotonic at delivery of the babies [2]. The World Health Organization estimates that, in 2010 nearly 287,000 women died from complications of pregnancy and childbirth. Most of these deaths occur in developing countries, often due to inability of women to access to life-saving cares [3]. Postpartum hemorrhage deaths are concentrated in developing countries, and slightly more than 43% of them occur in Northern and Sub-Saharan Africa. In Egypt, the maternal mortality ratio stood at 45 deaths per 100,000 live births in 2013 according to the World Health Organization (WHO) [4]. Active management of the third stage of labour lowers maternal blood loss and reduces the risk of PPH. Prophylactic oxytocics should be offered routinely in the management of the third stage of labour in all women as they reduce the risk of PPH by about 60% [5].

Carbetocin was first described in 1987 [6] and is a long-acting synthetic analogue of oxytocin, with agonist action. It has a half-life of 60 minutes, and uterine contractions occur in less than 2 minutes after IM or intravenous administration [7] Its main advantage over oxytocin is a four-fold longer uterotonic activity, a fact which precludes the necessity of a continuous infusion [8]. In a study done

by Soltan and Sadek to evaluate efficacy of aortic compression in controlling PPH there were no deaths due to PPH and only four complications were recorded in two years [9]. The EACD contributed safely and effectively to the treatment of 60 women with PPH of different causes [10].

Patients & Methods

Setting: This study was conducted in the labor ward of the department of Obstetrics & Gynecology, Maternity Hospital Minia University, Egypt during period from February 2014 to August 2015. There are approximately 10876 deliveries per annum. The study included 724 patients which developed primary atonic PPH after vaginal delivery, wherever the labor conducted inside the hospital or referred to hospital from private centers or secondary governorate hospitals.

Outcome measures: Estimated amount of blood loss, drop in Hb level, need for blood transfusion, need for additional procedures to control PPH (balloon tamponed or surgical interference), duration of treatment, occurrence of side effects, morbidity (Hysterectomy).

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Inclusion criteria:

- Women with a pregnancy beyond 37 weeks & less than 42 weeks gestation
- primary atonic postpartum hemorrhage
- vaginal delivery
- singleton pregnancy

Exclusion criteria:

- Women undergoing C/S
- Causes of PPH other than uterine atony (traumatic PPH, Presence of coagulation dysfunction, Retained placenta, Women were receiving anticoagulant).
- Multiple pregnancies
- Secondary PPH
- PTL
- Chorioamnitis
- Malpresentation
- Instrumental delivery
- Postdate
- Induction of labor

All women delivered vaginally and developed primary atonic PPH were included in the study. Patient's data was collected from medical records

All patients received conventional treatment of PPH in the form of:

- nasal oxygen administration
- obtaining intravenous access
- abdominal uterine massage
- bimanual uterine compression
- urinary bladder catheter
- vital signs monitoring
- withdrawal of blood sample for cross matching and investigation (renal function, liver function, complete blood count, coagulation profile)
- uterotonics in the form of sublingual 600 µg misoprostol [11]
- 20 IU oxytocin infusion (Syntocinon®, Novartis, Switzerland)

Patients groups:

Patients were allocated into four groups according to management received documented in patient file.

Group (1): including patients that received carbetocin (Pabal® Ferring, UK) in dose 100µg which was diluted in 10 ml normal saline and administered slowly over (30-60 seconds) by intravenous (IV) route of administration (12) together with manual external aortic compression Standing on the right side of the patient, the performer of the maneuver places his left fist just above and slightly to the left of the patient's umbilicus and exerts the strongest possible pressure on her abdomen, with the palm of the right hand covering and applying the strongest possible pressure on the left fist. The person performing the maneuver was replaced every 5 min to ensure effective compression. (9)

Group (2): Conventional resuscitation plus carbetocin alone with

same dose as in first group.

Group (3): Received conventional plus manual external aortic compression alone .

Group (4): Including patients that received conventional treatment alone.

Procedure

Data Collection

Postpartum blood loss was measured by using the calibrated under-buttocks drape, placed under women's buttocks kept in place for at least 2 hours. Drape is manufactured from malleable plastic material, stored in a closed clean package, disposable, easy applied, modified to be suitable for different sizes, graduated up to 3000ml with easy reading and follow up [13]. Drop in HB% 12 hours after delivery, number of cases in each group needed additional measures, blood transfusion, duration of treatment in minutes and patients developed complications. All these measures were reported from patient medical records.

Statistical analysis

The results were recorded, tabulated and statistically analyzed. The data of all patients were analyzed using SPSS (version 15.0., 2006). For qualitative characteristics, the number and percentage of women with these characteristics were calculated, for quantitative characteristics, range, mean and standard deviations were calculated. Comparative statistics were done among different groups using analysis of variance (one-way ANOVA). P value < 0.05 was considered significant, the 95% confidence intervals (95% C.I.) of various groups were determined.

Ethics

The study protocol was approved by local ethical committee of Obstetrics and Gynecology department Maternity Hospital Minia University, Egypt.

Results

The study included 724 patients with no statistically significant difference between the four groups as regards; maternal age, gestational age in weeks, parity (Table1).

(Table2) Main outcome: As regard mean blood loss it was lower in group (1) but with no significant difference between the other groups. A significant difference was noticed between the four groups as regard drop in HB%. There was statistically significant reduction in the need for blood transfusion especially in group 1, there was also reduction in number of patients needed further intervention only 19.4% in group(1), duration of treatment(time to stop bleeding) was lower in group (1) when compared with other groups and also there was reduction in number of patients that developed complication. There was no maternal mortality recorded.

Discussion

PPH is the nightmares of all obstetricians especially in low resources countries due to lack of clear systematic guidelines in managing PPH in general hospitals and private centers and delay timely diagnosis, patient transfer for appropriate intervention. El-Minia is an agricultural governorate located in the northern part of Upper Egypt. Its population is 5438505. Maternity Hospital Minia University is a tertiary teaching hospital, receive all patients that need critical care services from all Minia Governorate Hospitals and private centers. The goal and clinical dilemma of PPH management is to balance minimally invasive conservative treatment that preserves fertility and avoid complications and save patient life. Systematic

Table 1: Patient characteristics in the studied groups

	Group I (N=180)	Group II N=198	Group III N=164	Group IV (N=182)	P-value
Age in years (mean+/-SD)	27.21±6.8847	25.21±8.7646	26.04±7.4254	28.04±6.3165	0.38
Low parity (P1-P4)	61(33.8%)	67(33.8%)	68(41.4%)	76(41.8%)	0.74
High parity (P5 or more)	119(66.2%)	131(66.2%)	96(58.6%)	106(58.2%)	0.75
Gestational age in weeks (mean+/-SD)	37.4±1.6	36.4±2.1	38.3±.94	37.3±1.4	0.91

Table 2: Main outcomes studied in all groups

	Group I (N=180)		Group II N=198		Group III N=164		Group IV (N=182)		P-value	95% CI
Mean HB deficit	1.226±0.367		1.128±0.578		1.380±0.997		1.490±0.886		0.002	-0.26 to -6.22
Cases needed other intervention	35(19.4%)		40(20.2%)		99(60.3%)		111(60.9%)		0.0002	
Mean blood loss	735.2±332.93		735.2±332.93		992.2±341.46		992.2±341.46		0.233	-151.05 to 37.05
Mean time of control of bleeding	67.6 ± 12.6		69.8 ± 18.8		73.5 ± 11.6		79.9 ± 16.9		<0.04	
Need for blood transfusion	yes	no	Yes	No	Yes	No	Yes	No	<0.04	-9.68 to 0.18
	126(70%)	54(30%)	143(72.2%)	55(27.3%)	126(76.8%)	38(23.2%)	150(82.4%)	32(17.6%)		
Number of cases developed complications	10(5.5%)		13(6.7%)		12 (7.3)		14 (7.6)		<0.04	

reviews related to PPH management are focused on specific aspects including uterine balloon tamponade in resource-poor settings, [14] emergency hysterectomy for PPH, [15] and pregnancy outcomes after surgical treatment. 16 other studies focused on which drug is most effective medication for prevention of PPH [12,17-20].

In the current study we focused on the most effective primary measures that give rapid, effective, long control of blood loss and decrease need for further intervention. The effectiveness of sublingual misoprostol in treating PPH has now been established however, there is still lack of clarity on the most appropriate dose that will be safe and effective to minimize adverse effects [21,22].

Previous study done by Soltan and Sadek they compare maternal mortality and morbidity due to postpartum hemorrhage (PPH) at Maternity Hospital Minia University, before and while external aortic compression was applied as an adjunct maneuver, they compare the obstetric data and outcomes of women with PPH for 8 years, when only a regular PPH management protocol was followed, and for 2 years, when external aortic compression was applied. The El-Minia aortic compression device (EACD) was used in 2008 and the manual aortic compression maneuver (MACM) in 2009. During the first period, PPH annually caused 6 deaths and 22-31 complication. The incidence of PPH declined from 4.6% in 1999 to 0.9% at the end of the study. In 2008 and 2009, there were no deaths due to PPH and only four complications were recorded in each of these two years. The almost similar results reached with the EACD and MACM.

A prospective randomized study compare Carbetocin 100 µgm and oxytocin 5 IU in treatment of PPH. The amount of blood loss and the need for other uterotonic were significantly lower in the carbetocin group (811 ± 389.17 vs. 1010 ± 525.66 and 10/50 vs. 21/50). There was no significant difference between the 2 groups regarding blood pressure measured immediately after the drug administration and at 30 and 60 min later. With no significant difference between the 2 groups in the occurrence of drug side effects. They concluded that Carbetocin is a better alternative to oxytocin in management of atonic

PPH with non-significant hemodynamic changes or side effects [23].

Unfortunately there is limited researches that study the therapeutic effect of carbetocin in cases of atonic PPH, we hope for further studies justify the exact role of carbetocin among other oxytocic drugs in prevention and treatment of PPH and decrease patient burdens.

Limitation of the study

1. Retrospective nature of the study.
2. Poor resources, sometimes carbetocin is unavailable due to its high cost so we could not give the patients the best care needed.
3. Incomplete documentation of some cases so they omitted from the study.

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