



DUTTA'S SCORING TECHNIQUE FOR EARLY DETECTION AND MANAGEMENT OF UTERINE ATONY DURING EMERGENCY LSCS- A RANDOMIZED TRIAL.

ORIGINAL ARTICLE, Vol-5 No.2

Asian Journal of Medical Science, Volume-5(2014)

<http://nepjol.info/index.php/AJMS>

¹Dilip Kumar Dutta, ²Indranil Dutta. ¹Senior Consultant, Gice Clinic Kalyani, West Bengal, India. ²Assistant Professor, IQ City Medical College, Durgapur, West Bengal, India.

CORRESPONDENCE :

Dr Dilip Kumar Dutta

A-9/7, Kalyani, Nadia

West Bengal-741235

Email ID:

drdilipdutta@yahoo.com

(M): +919433032986

"Dutta's scoring system is a new unique method to prevent PPH during emergency cesarean section"

ABSTRACT

Background: Uterine atony accounts for 80 % of causes of PPH and is one of the important cause of maternal death.

Objective: To analyze the efficacy of Dutta's score for early detection and management of uterine atony during emergency LSCS to prevent PPH.

Study methods: This study was undertaken at JNM, NSGN, CN at Kalyani, Nadia, West Bengal India from 1st January 2007 to 31st December 2011. Three hundred cases undergoing emergency LSCS were selected for randomized trial. Clinical observations were made after placental expulsion for scoring which includes shape and size of uterus, rugosity, tone, placental localization and time of placental expulsion. Score of 0, 1, 2 were given on each observation. Three groups are created depending on scoring-Group A (130) -8 to 10, Group B (N-100) -5 to 7 and Group C (N-70) - <5 for better management.

Management protocols were formulated in the three groups for prevention of PPH-

Group A:- Oxytocin 10U (5U IM + 5U IV 40drops/min in Ringer Lactate 500ml)

Group B:- Oxytocin 15U (5U IM + 10U IV 40drops/min in Ringer lactate 500 ml) + methyl ergometrine (0.25mg IM) + anterior posterior uterine wall compression

Group C:- Oxytocin 20 U- (5U IM plus 15 U IV 40 drops in Ringer Lactate 500 ml) + methyl ergometrine (0.5mg IM) + carboprost (250 mcg IM) + lateral followed by anterior posterior uterine wall compression + compression of isthmic region of uterus + misoprostol 800mg per rectal during post operative period.

Results: After adopting Dutta's score and management protocols it was interesting to observe that intra and post operative blood loss within 2hr were found to be significantly reduced in group A-69.3% (<300CC), 84.6%(<200CC) and group B-70%(<300cc), 72%(<200CC). Intra operative blood loss >500cc were also found to be reduce in group A-7.6%, group B-14%. In group C intra operative blood loss >500cc were seen in 47.1 % and post operative -32.9% cases. Hemoglobin level <11gms after 24 hrs of LSCS was found to be minimally reduced (in comparison to preoperative hemoglobin level) in group A (1.5%), group-B (2%) and group C (11.4%).

Conclusion: Early diagnosis and management of uterine atony during emergency LSCS after adopting Dutta's score were found to be not only reduce intra and post operative blood loss but also was found to maintain a satisfactory hemoglobin level and hemodynamic status. Maternal mortality was found to be nil. This randomized trial highlighted the importance of prompt treatment in group C to reduce intra and post operative blood loss and maternal morbidity and mortality.

Keywords: uterine atony, Dutta's score, PPH, MMR.

INTRODUCTION

Uterine atony was found to be the most common cause of PPH. The ability to identify which women will experience atony is limited and with or without risks factors.¹ Till date a lot of work have been done to prevent uterine atony and also develop evidence based medical and surgical interventions to save the uterus for fertility preservation in future. Paramount importance for every obstetrician is to prevent PPH due to uterine atony during emergency LSCS by early detection, assessment of the severity and search for specific causes. Life threatening PPH can be a nightmare to the obstetrician and requires an active multidisciplinary management to prevent maternal morbidity and mortality.²

Considering the above facts, randomized trial was undertaken to review and analyze early diagnosis and management of uterine atony during emergency LSCS in an uncomplicated pregnancy to prevent PPH by advocating Dutta's Score.

MATERIALS AND METHODS

This randomized trial were undertaken at JNM, NSGH, CN at Kalyani, Nadia, West Bengal, India from 1st January 2007 to 31st December 2011. Three hundred cases who undergone emergency LSCS were selected for this study.

During LSCS clinical observations were advocated on findings of uterine condition after placental expulsion by control cord traction for scoring which includes shape and size, rugosity, tone, placental localization and time of placental expulsion. Score of 0,1, 2 were given on each observation. Three groups are created - group A(130) -8 to10 , group-B(N-100)- 5 to7 and group -C(N-70)- <5 for prompt management. Management protocols were formulated in the three groups for preventing PPH –

Group A – Oxytocin 10U (5U IM + 5U IV 40drops/min in Ringer Lactate 500ml)

Group B- Oxytocin 15U (5U IM + 10U IV 40drops/min in Ringer lactate 500ml) + methyl ergometrine (0.25mg IM) + anterior posterior uterine wall compression for 2 to 5 minutes.

Group C – Oxytocin 20 U –(5U IM plus 15 U IV 40drops in Ringer Lactate 500 ml) + methyl ergometrine (0.5mg IM) + carboprost (250 mcg IM) + lateral compression (2

to 3 minute) followed by anterior posterior uterine wall compression(3 to 4 minutes) + compression of isthmus of uterus + misoprostol 800mg per rectal during post operative period.

During post operative period oxytocin 5U- 30 drops in DNS in group A and group B for 6 hrs whereas in Group C, 10 unit 30 drops in Ringer lactate for 6 hrs and 5 unit in DNS for 6 hrs were administered .Continuous bladder drainage by indwelling catheter for 24 hrs were advocated in all groups.

- Thorough history taking, clinical assessment along with duration of labour, blood profile was done.
- USG was advocated to see fetal parameter and placental localization, its shape and size etc
- Primigravida, 18 yrs to 30 yrs, 38 to 40 wks maturity, 4 to 5 ANC were selected for this randomized trial.
- Labour within 8 hrs were selected for this study.
- 1000 ml crystalloid was given before regional spinal anesthesia (bupivacaine 2.5cc) to prevent hypovolemia.
- Blood sugar, Sodium, Calcium, Potassium, Magnesium levels and platelet count were done during first visit and before emergency LSCS.
- After placental expulsion uterus pulled out exteriorly for quick diagnosis. Closure of uterine wound were done in two layers with absorbable chromic 1 suture after securing bleeding in the uterine cavity and ensuring absence of blood clots inside the uterine cavity. Total time taken is 10 to 15 minutes .Uterus is then replaced in the original anatomical position in the abdomen.
- Intra operative blood loss was estimated from standard mop (50x20 inch) weight, blood from suction apparatus and blood clot.
- Post operative blood loss per vagina was estimated by collecting blood in kidney tray and weight of sanitary pad.
- Informed consent was obtained from the patient and relatives and possibility of hysterectomy or other operative intervention were counseled.

Exclusion criteria- un-booked cases, patient not in labour, obstructed labour, prolonged labour more than 10 to 12hrs, any medical and surgical complications of pregnancy, fibroid uterus and congenital abnormality of uterus .

RESULTS

Showing criteria of scoring depending on observations on uterus following placental expulsion-shape and size of the uterus, rugosity, tone, placental localization and time of placental expulsion (Table 1). Intra operative blood loss <300cc was noted in 69.3% of patients in Group A and 70% of patients in Group B. Intra operative Blood loss >500cc was observed in 7.6% of patients in Group A and 14% of patients in Group B. In group C intra operative blood loss >500cc were seen in 47.1% cases (Table 4). Post operative blood loss (within 2hrs) was found to be less than 200cc in 84.6% (Group A), 72% in group B and 25.7% in group C. In group C blood loss in between 201 to 500 cc was found to in 41.4% of patients whereas in group A -15.4% and group B – 18%. Blood loss above 500 cc was seen in group C- 32.9 %, managed by blood transfusion (Table 5).

Hemoglobin level, after 24 hrs, (below 11 gm %) were found to be less reduced in group A (1.5%), group-B(2%) as compared to group C(11.4%) from preoperative to post operative period (Table 6).

Hemodynamic status in all group were found to be uneventful except hypotension observed mainly in group C -10% which was managed by DNS fluid. No maternal death was reported (Table 7).

DISCUSSION

A lot of evidence based recommendations were formulated during LSCS 1) placenta should be primarily removed by cord traction³ 2) oxytocin is the recommended drug for prevention of PPH at cesarean section. Comparative studies were done on a) ergometrine versus oxytocin, b) misoprostol versus oxytocin or placebo, c) Injectable prostaglandin versus oxytocin, haemodynamic effects of oxytocin⁴⁻¹¹, 3)Carbetocin should not be used for prevention of PPH in preference to oxytocin¹² 4)The guideline development group acknowledges the paucity of scientific evidence and recognizes that both IV and IM routes are currently in use for prevention of PPH with oxytocin. Based on

this, the guidelines development group considers both routes as valid but recommends additional research.¹³ 5) In settings where IV oxytocin alone should be used for treatment of PPH in preference to misoprostol.^{14,15}

Till date there is a lack of evidence how uterine atony, without risks factor, can at least be anticipated well in advance before developing life threatening PPH during caesarean section. Hence paramount importance for every obstetrician is to observe the uterus and to assess the severity and specific causes that lead to uterine atony immediately after placental expulsion during emergency LSCS.

A randomized trial was undertaken by author for early detection of uterine atony and its immediate management by adopting Dutta's scoring technique during emergency LSCS to prevent intra partum and post partum hemorrhage. During LSCS clinical observations were done on uterus for scoring which includes shape and size of uterus, tone, rugosity, placental localization and time of placental expulsion. 0, 1, 2 were given on each observations. Three groups are created group A (N-130) group B(N-100) and group C(N-70) for prompt treatment.

In the present study, since all cases are booked cases, all blood parameters including sodium, calcium, potassium, and magnesium were done at first visit and during emergency LSCS. It was observed from different studies that in prolonged labour, there may be electrolyte imbalance and lower level of blood sugar may lead to impairment of the uterine contraction.^{16,17} Hence it is paramount important for every obstetrician to measure the electrolyte level (Na⁺, Ca⁺⁺,K⁺, Mg⁺⁺) ,blood sugar (un-booked cases) before advocating emergency LSCS.

Oxytocin ,which was used in all groups in increasing doses (IM and IV) depending on scoring, was found to reduce the need for additional uterotonic agents, which was also observed in group A but does not affect the overall occurrence of major obstetrical hemorrhage as seen in group B and group C. In Group B additional use of methyl ergometrine 0.25 mg IM produces prolonged uterine contractions in both upper and lower uterine segments whereas in Group C methyl ergometrine 0.5 mg IM and in addition to Inj. carboprost 250 mcg IM were found to have a strong

Table 1. Criteria of Scoring

Uterus	0	1	2
Shape and size	Broad and flat (discoid)	Less elevated, narrow, hard and globular shape	More elevated, narrow Hard and globular shape
Rugosity	Absent	Present, either in anterior or posterior surface	Present in both surfaces
Tone	Soft	Firm	Hard, contracted
Placental Localisation	Lower segment	Fundo anterior	Fundo posterior
Time of Placental Expulsion	>5 min	3 -5min	<3 min

Table2. Showing distribution of scoring in groups

Groups	Pattern of Scoring	Score
Group A (N-130)	S.S-2,R-2,T-2, PL-1to2,P.E – 1 to 2	8 to 10
Group B (N-100)	S.S-1,R-1,T-1, PL -1 to 2, P.E-1 to 2	5 to 7
Group C (N-70)	S.S-0,R-1 ,T-O, PL-1 to 2, P.E -1 to 2	<5

Abbreviation = S.S –Shape and size, R-Rugosity, T- Tone, PL –Placental Localization, P.E- placental expulsion. Distribution of groups , pattern of scoring and score were advocated for better management.(Table 2)

Table 3. Management Protocols

	Oxyt*	Methyl erg**	Carboprost	Lateral compression on upper segment of uterine wall	Anterior posterior uterine wall compression	Isthmus compression	Misoprostol 800mcg per rectal
Group A(N=130)	10U	-	-	-	-	-	-
Group B(N=100)	15U	0.25mg	-	-	Yes	-	-
Group C(N=70)	20U	0.5mg	250mcg	Yes	Yes	Yes	Yes

Abbreviations: - * Oxytocin, ** Methyl Ergometrine

Different type of protocols along with drugs , doses ,routes etc were advocated in three groups for better management.(Table 3)

Table 4. Intra-operative blood loss

	<300cc	301-500cc	>500cc
Group A (N=130)	90 (69.3%)	30 (23%)	10 (7.6%)
Group B (N=100)	70 (70%)	16 (16%)	14 (14%)
Group C (N=70)	11 (15.8%)	26 (37.1%)	33 (47.1%)

Table 5. Post operative blood loss within 2 hrs

	<200cc	201 -500cc	>500cc
Group A (N=130)	110 (84.6%)	20 (15.4%)	-
Group B (N=100)	72 (72%)	28 (18%)	
Group C (N=70)	18 (25.7%)	29 (41.4%)	23 (32.9%)

Table 6. Hemoglobin level in gm %

	Pre-Operative		Post Operative	
	<11gm%	>11gm%	<11gm%	>11gm%
Group A (N=130)	108 (83.1%)	22 (16.9%)	110 (84.6%)	20 (13.4%)
Group B (N=100)	90 (90%)	10 (10%)	92 (92%)	8 (8%)
Group C (N=70)	48 (68.6%)	22 (34.4%)	56 (80%)	14 (20%)

Table 7. Hemodynamic status and maternal death

	Hypotension	Cardiac Arrest	Pulmonary Oedema	Renal Failure	Maternal Death
Group A(130)	3(2.3%)	-	-	-	-
Group B(100)	4(4%)	-	-	-	-
Group C(70)	7(10%)	-	-	-	-

utero- tonic effects.

In spite of multiple administrations of different drugs bleeding persisted in group B and group C. Hence no time was lost to control hemorrhage by adopting the following management steps which were initiated immediately by anterior posterior uterine wall compression for 2 to 5 minutes, were found to be effective in group B whereas in group C lateral compression for 2 to 3 minute to be followed by anterior posterior uterine wall compression 3 to 4 minute and compression of isthmus of uterus (compression of both uterine arteries at the isthmus region) for 2 minutes were found to be effective. Misoprostol 800 microgram per rectal during post operative period were found to be of additional advantages to reduce intra and post operative blood loss in group C as it was observed in this study.

It is very much significant to observe that after adopting Dutta's score and subsequent management - intra operative and post operative blood loss within 2hr were found to significantly reduce in Group A - 69.3%(<300cc), 84.6% (<200cc) and Group B -70%(<300 cc) , 72% (< 200cc). Intra operative blood loss >500cc were also found to be reduce in Group A -7.6% Group B

-14%. In Group C blood loss > 500cc during operation - 47.1 % and post operative blood loss - 32.1% were found to be increased, as compared to Group A and Group B..

This study also showed that hemoglobin level below 11gm% were not found to be significantly reduced, either in Group A (1.5%), Group B (2%) and Group C (11.4%). Hemodynamic effects^{12, 13} in the form of hypotension were observed in Group A (2.3%), Group B (4%) and Group C (10%) which were controlled by DNS fluid. Maternal death found to be nil.

CONCLUSION

Early diagnosis and management of uterine atony during emergency LSCS, after advocating Dutta's score, was found not only to reduce intra and post operative blood loss, but also helped to maintain good hemoglobin level and the hemodynamic status of the patient.

This randomized trial has also highlighted the importance of prompt treatment in group C to reduce intra and post operative blood loss, other operative interventions and maternal death.

It also appears from this randomized trial that Dutta's scoring system is of definite help to the obstetrician for prompt diagnosis and treatment and to prevent primary

PPH during emergency LSCS. Further study, may be multi centric, will give more insight regarding the scoring system.

REFERENCES

1. Rouse DJ, MacPherson C, Landon M, et al. Blood transfusion and cesarean delivery. *Obstet Gynaecol* 108:891, 2006.
2. DK Dutta: post partum Hemorrhage- Uterine atony: Obstetrics Hemorrhage made easy, chap 16, pg 215-223, published by Jaypee brothers; FOGSI publication.
3. Anorlu RI, Maholwana B, Hofmeyr GJ, Methods of delivering the placenta at caesarean section, *Cochrane Database Syst Rev*, 2008 July.
4. Mahomed K, Sheehan S, Murphy DJ, Heatley E, Middleton P, Medical methods for preventing blood loss at caesarean section. *Cochrane Database of Systematic Review* 2011, Dec. Editorial process. Art. No: CD007576. DOI:10.1002/14651858.CD007576.
5. Kim TS, Bae JS, Park JM, Kang SK. Haemodynamic effects of continuous intravenous injection and bolus plus continuous intravenous injection of oxytocin in caesarean section. *Korean J Anesthesiol*. 2011 Dec; 61(6):482-487
6. Thomas JS, Koh SH, Cooper GM; Haemodynamic effects of oxytocin on infusion on women undergoing caesarean section. *Br. J. Anaesth*, 2007; 98:116-119.
7. Svanstrom MC, Biber B, Hanes M, Johansson G, Naslund U, Balfors EM. Signs of myometrial ischemia after injection of oxytocin : a randomized double – blind comparison of oxytocin and methylethylergometrine during caesarean section. *Br J Anaesth* . 2008 May; 100(5):683-689.
8. Sarna MC, Soni AK, Gomez M, Oriol NE. Intravenous oxytocin in patients undergoing elective cesarean section. *Anesth Analg*, 1997; 84: 753-756(PubMed)
9. Pinder AJ, Dresner M, Calow C, Shorten GD, O'Riordan J, Johnson R. Haemodynamic changes caused by oxytocin during caesarean section under spinal anaesthesia. *Int J Obstetric Anesth*. 2002; 11: 156-159.
10. Peterson M; Cardiovascular effects of oxytocin; *Prog Brain Res*. 2002;139:281-288.
11. Cooper GM, Lewis G, Neilson J, Confidential enquiries into maternal deaths, 1997-1999. *Br J Anaesth*; 2002: 89:369-372.
12. Su LL, Chong YS, Samuel M. Oxytocin agonists for preventing postpartum haemorrhage. *Cochrane Database of Systematic Reviews*, submitted for publication issue 1 2012. GRADE tables 15-17.
13. Oladapo OT, Okusanya BO, Abalos E. Intra muscular versus intravenous prophylactic oxytocin for the stage of labour. *Cochrane Database of Systematic Reviews*.
14. Mousa HA, Alfirevic Z. Treatment for primary post partum haemorrhage. *Cochrane Database of Reviews*, submitted for publication issue 1 2012 GRADE tables 18 -19.
15. Derman RJ, Kodkany BS, Gaudar SS, et al; Oral misoprostol in preventing post partum haemorrhage in Resource-poor communities: A randomized control trial. *Lancet*; 368: 1248, 2006
16. Hawkins, D.F and Nixon, W.C.W; *J Obstet. Gynaec, Brit. Emp*; 1957, 64, 641
17. Corner, G.W, and Csapo, A; *Brit. Med. J*, 1953, 1, 687.

Authors Contributions:

DKD & ID: Concept and Design of the study, formulated the scoring technique, parameter assessments, score measurement, analysis and interpretation, manuscript preparation, critical revision of the manuscript, data collection, statistical analysis, and literature search.

Conflict of Interest: None

Date of Submission: 31.8.2013

Date of Peer review: 18.9.2013

Date of submission of revised version: 10.10.2013

Date of peer review: 15.10.2013

Date of Acceptance: 16.10.2013

Date of Publication: 10.1.2014