ORIGINAL ARTICLE

Drotaverine for Acceleration of Labour with Reduced Incidence of Caerserean Section and No Postpartum Haemorrhage

[1]NADIA SABEEN, [2]FARZANA LATIF,[3]AQUILA FAZIL
[1]Senior Registrar LGH, [2]Associate Prof. AMC/PGMI/ LGH, [3]Assistant Professor FJMU/SGRH, Lahore).
Corresponding Author:- Dr. Nadia Sabeen, House No 52 Block H Model Town Lahore.
Mobile No: 03354063625

ABSTRACT

Aims & Objectives: To compare the outcome in labouring patients receiving drotaverine versus control group.

Setting: Department of Obs & Gynae Unit-III Services Hospital, Lahore. Study Design: Randomized controlled drug trial.

Sampling Technique: Simple Random sampling.Duration of Study:12-10-14 to 11-04-15

Subjects and Methods: A total of 200 patients (100 in each group) were included in the study. group-A was given 40mg of intravenous drotaverine in first stage of labour during active phase and its effect was assessed by calculating the time in minutes to reach the full dilatation of cervix while group-B did not receive any drug and used as control group. The dose was repeated after 2 hours, if the rate of dilatation of cervix was less than 1cm/hr in primigravida and 1.5cm/hr in multigravida. Patients were monitored in postnatal period in first 24 hours for postpartum haemorrhage in both the groups as per operational definitions. Results were recorded on spss version for final analysis.

Results: patients were ranged between 20-40 years of age. Mean age of the patients was 22.51±4.70 and 26.20±4.55 years in group-A and B, respectively. Mean gestational age was 39.35±1.08 weeks in group-A and 39.59±0.99 weeks in group-B. Postpartum haemorrhage was occurred in 13 patients (13.0%) of group-A and 14 patients (14.0%) of group-B. In group-A, 93 patients (93.0%) and in group-B, 76 patients (76.0%) vaginal delivery performed while in 7 patients (7.0%) of group-A and in 24 patients (24.0%) of group-B caesarean section was carried out. There was statistically significant difference between the two groups (p=0.001). In group-A 56 ladies (56.0%) and in group-B 51 ladies (51.0%) were primigravida while 44 ladies (44.0%) in group-A and 49 ladies (49.0%) in group-B were multigravida. Mean duration of first stage of labour was 206.80±24.45 and 308.40±48.69 in group-A and B, respectively (p<0.001). Stratification with regard to parity was carried out.

Conclusion: In Conclusion, The Use Of Drotaverine Hydrochloride During The active phase of first Stage Of Labor Is safe And Effective In Accelerating Labour. Its timely Administration during first stage of labour helps in faster and smooth progress Of Labor With faster Cervical Dilatation and minimal side effects.

Key words: Acceleration of Labour, Drotaverine, Caesarean Section

INTRODUCTION

Labour is a multifactorial process involving myometrial contraction leading to cervical ripening, dilatation and finally expulsion offetus and placenta. The first stage of labour in primigravida is 12-16 hours while in multigravida is 6-8 hours of duration [1]. Drotaverine is an isoquinolone derivative and is selective for type IV phosphodiesterase inhibitor, it reduces the smooth muscle spasm by maintaining the cAMP level and calcium level on specific sites of cervix, thus facilitates the cervical dilatation [3]. Drotaverine prevents prolonged labour by reducing the duration of labour. [4]The rate of dilatation of cervix is almost double with the use of drotaverine and it is a superior cervical dilatation agent [5]. Drotaverine do not cause any interference with uterine contractility and reduces the incidence of traumatic postpartum haemorrhage [6]. A randomized study conducted in 2014 concluded the results that the mean duration of labour in primigravida control group was 5 hours 48 minutes ± 1 hour 23 minutes and in multigravida control group was 4 hours and 43 minutes ± 1hour 7 minutes while in drotaverine group was 4 hours ± 28 minutes and 3 hour 19 minutes ±1 hour 5 minutes respectively, the same study also proved that there was no increased incidence of postpartum haemorrhage in both control and drotaverine group which was 4% in both the groups, it also proved that with the use of

drotaverine there was reduced incidence of caesarean section as 22% of patients delivered by caesarean sections in control group while in drotaverine group it was 4% [7].The rationale of our study was to observe the effects of drotaverine on cervical dilatation in our population. Although literature is available on studies conducted in other population but there is no local study available on this topic in Pakistan as there are genetic differences from one population to other, the effect of the drug may also vary accordingly and the study results may not be consistent with already existent literature as our hypothesis is that there is no increased incidence of postpartum haemorrhage (PPH) with the use of drotaverine but some studies proved that there is an association of increased incidence of PPH with the use of drotaverine so if we find this drug to have a significant effect on acceleration of labour without causing any PPH, It will help to decrease the risk of prolonged labour, maternal morbidity, caesarean sections rate, incidence of placenta previa and morbidity adherent placenta and will increase the rate of normal vaginal births without any increased incidence of PPH.

Operational Definition

Postpartum haemorrhage: Blood loss > 500ml after SVD or > 1000ml after C/section within 24hrs.

Hypothesis: Derotaverine facilitates the cervical dilatation and reduces the duration of labour and prevents prolong labour as compare to control.

MATERIALS AND METHODS

Sampling Technique:Simple Random Sampling.

Sample Selection: Two groups of patients were made i.e. Group-A and Group-B by lottery method. Group-A was given 40mg of i/v drotaverine in active phase of first stage of labour and its effect was assessed by calculating the time in minutes to reach the full dilatation of cervix and results were plotted on partogram, the dose was repeated after 2 hours if the rate of dilatation of cervix was less than 1cm/hr in primigravida and 1.5cm/hr in multigravida, while group-B did not receive any drug and was control group.

Inclusion Criteria: All low risk patients in active phase of labour with dilatation of cervix > 3cm including primigravida and multigravidas.

Exclusion Criteria: All high risk pregnancies; like placental abruptions, placenta previa and patients with allergy to drotaverine.

Data Collection Procedure: Two groups of patients were made i.e. Group-A and Group-B by lottery method. Group-A was given 40mg of i/v drotaverine in active phase of first stage of labour and its effect was assessed by calculating the time in minutes to reach the full dilatation of cervix and results were plotted on partogram, the dose was repeated after 2 hours if the rate of dilatation of cervix was less than 1cm/hr in primigravida and 1.5cm/hr in multigravida, while group-B did not receive any drug and was control group. Patients were monitored for ultimate delivery outcome by LSCS versus vaginal deliveries in both the groups. Patients were monitored in postnatal period in first 24 hours for postpartum haemorrhage in both the groups as per operational definitions. All this information was recorded in a predesigned proforma (attached).

Data Analysis: SPSS version 11.0 was used for data analysis. Quantitative variables including patient's age, gestational age and duration of labour was presented by mean and standard deviation. Qualitative variables like caesarean sections and postpartumhaemorrhage was presented by calculating frequency percentages. Chi square test was applied for significant difference between groups for PPH and caesarean section. T-test was applied for significance difference between groups for duration of first stage of labour. Data was stratified for parity. P value of$\leq$ 0.05 was considered significant.

METHODS and MATERIALS

This Randomized controlled trial was carried out at the department of Gynaecology and Obstetrics unit III Services Hospital Lahore from 12-10-14 to 11-04-15.It was estimated as 200 cases using 5% level of significance, 80% power of test with the expected percentages of PPH as 2.5% in control group and 18% in drotaverine group [8].The study was approved by ethical committee, A total of 200 patients (100 in each group) were included in the study.Patients including in study were at gestation >37 weeks, singleton fetus, cephalic presentation and with no obvious anomalies.Patients having known allergy to drotaverine,cephalopelvicdisproportion,any cervical injury and cervical surgery in the past were excluded from study. Patients were admitted from labour room, after informed consent, patient's biodata including name, age, parity was noted. A detailed history was taken and routine investigations wasperformed.Two groups of

patients were made i.e. Group-A and Group-B by lottery method. Group-A was given 40mg of i/v drotaverine in active phase of first stage of labour and its effect was assessed by calculating the time in minutes to reach the full dilatation of cervix and results were plotted on partogram, the dose was repeated after 2 hours if the dilatation of cervix was less than 1cm/hr in primigravida and 1.5cm/hr in multigravida, while group-B did not receive any drug and was control group. Patients were monitored for ultimate delivery outcome by LSCS versus vaginal deliveries in both the groups. Patients were monitored in postnatal period in first 24 hours for postpartum haemorrhage in both the groups as per operational definitions. All this information was recorded in a predesigned proforma (attached).SPSS version 11.0 was used for data analysis. Quantitative variables including patient's age, gestational age and duration of labour was presented by mean and standard deviation. Qualitative variables like caesarean sections and postpartumhaemorrhage was presented by calculating frequency percentages.Chi square test was applied for significant difference between groups for PPH and caesarean section. T-test was applied for significance difference between groups for duration of first stage of labour. Data was stratified for parity. P value of$\leq$ 0.05 was considered significant.

RESULTS

200 cases (100 cases in each group) were including this study during the study period of six months from 12-10-2014 to 11-04-2015.Patients were ranged between 20-40 years of age. Mean age of the patients was 22.51±4.70 and 26.20±4.55 years in group-A and B, respectively.Mean gestational age was 39.35±1.08 weeks in Group-A and 39.59±0.99 weeks in Group-B.In group-A 56 ladies (56.0%) and in group-B 51 ladies (51.0%) were primigravida while 44 ladies (44.0%) in group-A and 49 ladies (49.0%) in group-B were multigravida.Mean duration of first stage of labour was 206.80±24.45 and 308.40±48.69 in Group-A and B, respectively (p<0.001) (Table-1).

Table 1: Comparison Of Duration Of First Stage Of Labour. (In Minutes.)

Group	Duration of first stage of labour (min)		P value
	Mean	SD	
Group-A (Drotaverine 40mg i.v)	206.80	24.45	P<0.001
Group-B (Control)	308.40	48.69	

Table-2

Mode of delivery	Group-A (Drotaverine 40mg i.v)		Group-B (Control)	
	No.	%	No.	%
Vaginal	93	93.0	76	76.0
Caesarean section	07	07.0	24	24.0

p=0.001) (Table-2).Postpartum haemorrhage was occurred in 13 patients (13.0%) of group-A and 14 patients (14.0%) of group-B .(table 3)

Table-3: Distribution of cases by postpartum haemorrhage (PPH)

Postpartum haemorrhage	Group-A (Drotaverine 40mg i.v)		Group-B (Control)	
	No.	%	No.	%
Yes	13	13.0	14	14.0
No	87	87.0	85	85.0
Total	100	100.0	100	100.0

Chi Square=1.060, P value =0.589

In group-A, 93 patients (93.0%) and in group-B, 76 patients (76.0%) vaginal delivery performed while in 7 patients (7.0%) of group-A and in 24 patients (24.0%) of group-B caesarean section was carried out. There was significant difference between two groups (Distribution of cases by mode of delivery (table2).

DISCUSSION

Normal vaginal delivery at term has always been considered the preferred outcome for pregnancy, as economic and social benefits derived from vaginal deliveries,.along with that lowering the caesarean section rate has always been a goal for more than 25 years.

Prolongation of the first stage of labor is multifactorial and does not necessarily result from less optimal uterine contractility .There are different methods to increase uterine contractility such as amniotomy [08] and the use of oxytocin [09], and to accelerate the rate of dilatation of cervix. However, these methods are not without complications. The other method is to reduce cervical resistance by methods including mechanical means [10] and pharmacological agents such as spasmolytic drugs [11].The augmentation of labour and shortening the duration of first stage of labour without compromising maternal or fetal outcome is beneficial for both patient and obstetrician. The two major factors that determine the duration of labor are uterine contractions and the rate of dilatation of cervix [12].The process of labor can stress the fetus and mother. In one study [13].the rate of perinatal loss increased when the first stage of labor exceeded 20 hours and the second stage 2 hours. Prolonged labor has been associated with cesarean delivery [14]. hemorrhage and infection and they are leading causes of maternal death [15].Prolonged first stage of labor is the result of passive tissue resistance against all the measures that increase uterine contractility, such as amniotomy and use of oxytocics [16]. Dilatation of cervix is one of the important factors determining the duration of the first stage of labor. Failure of the cervix to dilate progressively can cause prolonged labour[6]. Cervical membrane stripping, cervical stretching [16], amniotomy [17] and various pharmacologic methods are used to facilitate cervical

Dilatation.The worldwide use of oxytocin is both for the induction and augmentation of labour[18] and prostaglandins have been used in various formulations to induce labour [18]. Various drugs, such as phloroglucinol [13] opioids (especially meperidine hydrochloride), tranquilizers (especially diazepam) [16],antispasmodics (such as valethamate bromide), drotaverine hydrochloride and hyosin-N-butyl bromide [12], have been used to shorten the duration of labour. Different studies reported that significant difference in the duration of the first stage was noted in women treated with drotaverine hydrochloride with shortening of labor by 22% up to 53% [20,21].

In present study, duration of first stage of labour was significantly less in drotaverine group when compared with control group (206.80±24.45 vs 308.40±48.69 minutes ($p<0.001$) which is consistent to the study carried out by Kaur et al [11].In current study, both groups were comparable in terms of PPH. Caesarean sections were performed in 7% patients of drotaverine group and 24% of control group ($p=0.001$).Singh et al [16], found that the administration of drotaverine hydrochloride during labor when cervical dilatation is 4 cm had a significant accelerating effect on the rate of cervical dilatation per hour with a difference of 0.5 cm/hr in comparison to the administration of placebo. Also, reported shortening of the duration of the first stage of labor by 47min (15%). Although this difference was not statistically significant in comparison with the placebo group, they pointed to the importance of reduction in the duration of an extremely stressful and painful state which may be of concern in the situations that need short induction delivery interval.Sharma et al [20] and Mishra et al [22] also demonstrated that drotaverine is associated with higher rate of cervical dilatation,it shortens the duration of 1st stage of labour and have very less adverse effects in therapeutic doses as compared to valethamate bromide.

CONCLUSION

In conclusion the use of drotaverine hydrochloride during the first stage of labour is safe and effective in accelerating labor. Its timely administration during first stage of labour helps in a smooth and faster progress of labour by virtue of faster cervical dilatation with minimal side effects. Studies on larger patient population with different doses and routes of administration is needed at different stages of cervical dilation before recommending the routine use of drotaverine during labour.

REFERENCES

1. TehaliaManpreet K, SajjanGouramba R, KorbuJyothi, Venkatesh S, Biradar R. A comparativestudy of Hyoscinebutylbromide versus Drotaverine hydrochloride in first stage of labor. J ObstetGynecol India 2008;58:230–34.
2. Tripti N, Jyoti J. To compare and evaluate the efficacy and safety of Drotaverine and valethamate bromide. J ObstetGynecol India 2009;59:324-31.
3. Kirmani SA, Malla MS, Regoo FM. Efficacy of Drotaverine in Comparison to HyoscineButylbromide in Augmentation of Labour. J Medical Sci 2012;15:39-43.
4. Madhu C, Mahavarkar S, Bhave S. A randomised controlled study comparing Drotaverine hydrochloride and Valethamate bromide in the augmentation of labour.ArchGynecolObstet 2010;282:11-5.
5. Irene V, Kaur V. Programmed labor for optimizing labor & delivery. JK Sci 2008;10:62-4.
6. Roy A, Patra KK, Mukhopadhyay S, Guha S. Study of drotaverine on first stage of labour and pregnancy outcome.J Indian Med Assoc 2007;105: 450-2.
7. Maria A. Comparative study of tramadol hydrochloride and drotavarine hydrochloride on cervical dilatation in active labour. Int J SciTechnol Res 2014;3:338-47.
08. A multicentrerandomised trial of amniotomy in spontaneous first labour at term. The UK Amniotomy Group.Br J ObstetGynaecol 1994; 101:307-9.
09. Bidgood KA, Steer PJ. A randomized control study of oxytocin augmentation of labour. 1. Obstetric outcome. Br J ObstetGynaecol 1987;94:512-7.
10. Calder AA, Greer IA. Cervical physiology and induction of labor. In: Bonnar J, editor. Recent advances in obstetrics and gynaecology. Edinburgh: Churchill Livingstone; 1992. p. 33-56.
11. Saini AS, Lata S. Effect of intravenous infusion of epidosin on labour. J ObstetGynecol India 1995; 45:708-10.
12. Gupta B, Nellore V, Mittal S. Drotaverine hydrochloride versus hyoscine-N-butylbromide in augmentation of labor. Int J GynaecolObstet 2008;100:247
13. Tabassum S, Afridi B, Aman Z. Phloroglucinol for acceleration of labour: Double blind, randomized controlled trial. J Pak Med Assoc. 2005;55:270-3.
14. Smyth RM, Alldred SK, Markham C. Amniotomy for shortening spontaneous labour. Cochrane Database Syst Rev 2007;17:CD006167.
15. Neilson JP, Lavender T, Quenby S, Wray S. Obstructed labour. Br Med Bull 2003;67:204.
16. Singh KC, Jain P, Goel N, Saxena A. Drotaverine hydrochloride for augmentation of labor.Int J GynaecolObstet 2004;84:17-22.
17. Fraser WD, Marcoux S, Moutquin JM, Christen A. Effect of early amniotomy on the risk of dystocia in nulliparous women. The Canadian Early Amniotomy Study Group. N Engl J Med 1993;328:1145-9.
18. Mastrogiannis DS, Knuppel RA. Labor induced using methods that do not involve oxytocin. ClinObstetGynecol 1995;38:259-66.
19. Mishra SL, Toshniwal A, Banjerjee R. Effect of drotaverine on cervical dilatation. A comparative study with epidosin (Valethamate bromide). J ObstetGynecol India 2002:52:76-9.
20. Sharma JB. Pundir P, Kumar A. et al. drotaverine hydrochloride vsValethamate bromide in acceleration of labor. Int J GynaecolObstet 2001; 74:255-60
21. Blasko G. Pharmacology, mechanism of action and clinical significance of a convenient antispasmodic agent: Drotaverine. J Am Med AssocInd Physicians' Update 1998;1:63-9.
22. Mishra SL, Toshniwal A, Banjerjee R. Effect of drotaverine on cervical dilatation. Acomparative study with epidosin (Valethamate bromide). J ObstetGynecol India 2002:52:76-9.