

Comparision of Drotaverine hydrochloride and Valethamate bromide in first stage of labour: a Prospective Randomized Controlled Study.

General Surgery

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ABSTRACT

Objectives: To compare the duration of labour and rate of cervical dilatation with drotaverine hydrochloride and valethamate bromide in first stage of labour. **Materials and methods:** Sixty consecutive uncomplicated primigravida with spontaneous onset of labour, at term gestation with vertex presentation were selected and randomized into two groups of 30 each. One group received drotaverine hydrochloride and another group received valethamate bromide as per protocol. Duration of labour, rate of cervical dilatation, maternal and fetal outcome were studied. **Results:** The mean rate of progress of labour in the drotaverine group (4.2 cm/hr) was significantly faster than that of the valethamate group (1.92 cm/hr). The mean duration of labour in the drotaverine group (167.85 minutes) was significantly lower than that of the valethamate group (297.06). 17% of the drotaverine group patients had instrumental deliveries as compared to 20% of the valethamate, which was not significant. One patient (in the drotaverine group) had Cesarean section. The most commonly observed maternal side effects were nausea and vomiting. Neither of the groups had serious complications. There was no significant difference in the fetal outcome. **Conclusion:** Drotaverine hydrochloride is more effective in dilating the cervix, thereby reducing the duration of labour, than valethamate bromide.

KEYWORDS:

drotaverine hydrochloride, valethamate bromide, labour augmentation, first stage of labour

Introduction:

Labour is defined as the progressive dilatation of uterine cervix with co-ordinated uterine contractions that effect in and expulsion of the products of conception. Labour stimulants like salt, onions, oil, mint, incense, wine and even ground up scarabs and tortoise shells were used.¹ "Accouchment force" was the term used for procedures and methods which included manual dilatation, fluid filled bogeys, instrumental dilators and various operative techniques like vaginal Cesarean section and Dührssen's incisions of the cervix. All were associated with trauma to the cervix, lower uterine segment and vagina.² Hence the need of the hour was a pharmacological agent that would help in dilatation and effacement of the cervix and thereby shorten the duration of 1st stage of labour, without interfering with myometrial activity, without affecting mother and fetus adversely.^{2,3} Cervical smooth muscle relaxants are well accepted addendum to the principle of active management of labour.^{2,4} Apart from uterine contraction, cervical dilatation is an important factor, which determines the duration of labour.

Drotaverine hydrochloride has been used as cervical relaxant. It is derivative of benzyl isoquinolone, which has got anti-phosphodiesterase action thus increases the intracellular level of adenosine monophosphate (cAMP). It is safe during pregnancy. So it is rapidly emerging as an excellent drug to hasten cervical dilatation. Headache, dizziness, constipation, flushing, hypotension can occur on intravenous injection.^{5,6}

Valethamate bromide is an ester which has got spasmolytic action by virtue of its anticholinergic and musculotropic action. It also relieves the spasm of smooth muscle of the cervix facilitating cervical dilatation.^{7,8,9}

Aims and objectives:

To compare the effects of drotaverine hydrochloride and valethamate bromide with regards to:

- Duration of labour
- Rate of cervical dilatation
- Maternal outcome
- Fetal outcome

Materials and methods:

This study is a prospective, randomized controlled study conducted in the department of Obstetrics & Gynecology in Mahatma Gandhi Medical College & Research Institute, Puducherry, from September

2014 to August 2015.

Subjects

60 pregnant women in active labour were enrolled in the study.

Inclusion criteria

Primigravida between 37 to 41 weeks of gestational age, with Single live intrauterine gestation with vertex presentation at the onset of active phase of labour.

Exclusion criteria

Clinical evidence of cephalopelvic disproportion, PIH, premature rupture of membranes, Pregnancy complicated by any medical illness, Hydramnios, IUGR, Antepartum haemorrhage, Previous uterine and cervical surgeries.

Drugs used

- 1) Oxytocin infusion -2.5 milli units/min.
- 2) For cervical dilatation –
 - a. Inj. Drotaverine –40mg IM, repeated 2nd hrly
 - b. Inj. Valethamate bromide –8 mg, IV, three doses 1/2hrly

Brief procedure:

Sixty primigravida between 37 to 41 weeks of gestational age, satisfying the selection criteria were allocated to two groups after randomization using table of random numbers.

- 1) The group-1 consisting of 30 pregnant women received drotaverine hydrochloride.
- 2) The group-2 consisting of 30 pregnant women received valethamate bromide.

In all women, general examination, systemic examination and obstetric examination including vaginal examination performed at regular intervals. Informed consent for inclusion in the study obtained.

Study Group (Drotaverine Group):

When the patient was in active phase of labour, i.e., at 3-4cm of cervical dilatation and fully effaced cervix, injection Drotaverine 40mg was injected intramuscularly. Drotaverine repeated 2nd hrly till full cervical dilatation. Oxytocin infusion in 500ml of RL started at the rate of 2.5 milli units /min and dosage titrated according to uterine contractions to a maximum of 11 milli units /min.

Control Group (Valethamate Group):

When the patient was in active phase of labour, i.e., at 3-4cm of

cervical dilatation, Oxytocin infusion in 500ml of RL started at the rate of 2.5 milli units /min and dosage titrated according to uterine contractions to a maximum of 11 milli units /min. At the same time, Inj. Valethamate bromide – 8 mg, IV, 3 doses ½ hrly given.

In both groups, labour was monitored by a partogram and following parameters were measured:

- 1) Rate of Cervical dilatation
- 2) Fetal heart rate monitoring
- 3) Maternal vitals monitoring
- 4) Duration of 1st stage of labour
- 5) Maternal complications
- 6) Fetal outcome

Data was analyzed with student 't' test and Chi Square test.

Results:

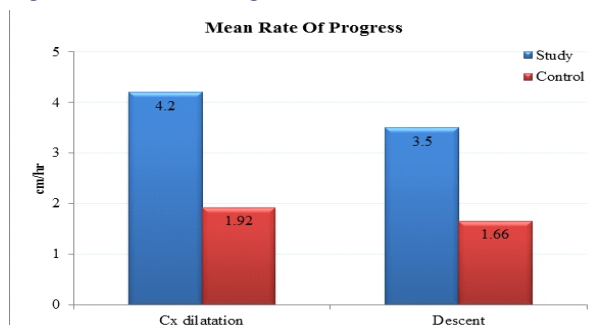
All the patients were between 18 – 30 years. The youngest and oldest in study group was 19 and 30 years respectively, in control group was 18 and 30 years respectively. There was no statistically significant difference between age distributions in the 2 groups ($p = 0.269$; student 't' test).

All the patients were between the gestational ages of 261 – 290 days. The minimum and maximum gestational age in study group was 269 days and 287 days respectively, in control group was 261 days and 287 days respectively. There was no statistically significant difference between the gestational ages of the 2 groups ($p = 0.983$; student 't' test).

The maternal pulse rate between the two groups ranged from 80 – 94 beats/min, average being 83 in study and 85 in control, which was not statistically significant. ($p = 0.09$; student 't' test).

The range of systolic and diastolic blood pressures were 110 to 130 mmHg and 60 to 80 mmHg respectively in both study and control groups, which was not statistically significant ($p = 0.276$; student 't' test).

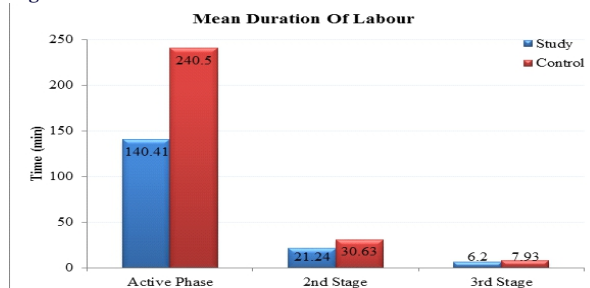
Figure 1: Mean Rate of Progress of Labour



The minimum and maximum rate of cervical dilatation in the study group was 1 cm/hr and 10 cm/25 min respectively and in the control group was 0.9 cm/hr and 3.5 cm/hr respectively, which was statistically significant ($p = 0.008$; student 't' test).

The rate of descent ranged from 1 cm/hr to 10 cm/hr and 0.8 cm/hr to 3 cm/hr in the study and control groups respectively. This difference was statistically significant ($p = 0.003$; student 't' test).

Figure 2: Mean Duration of Labour



The active phase of labour in study group ranged from 15 – 390 minutes and in control group ranged from 80 – 420 minutes ($p < 0.001$; student 't' test). The duration of 2nd stage was in the range of 6 – 84 minutes in study group and 5 – 65 minutes in control group ($p = 0.018$; student 't' test). The 3rd stage duration ranged from 2 – 15

minutes in study and 3 – 16 minutes in control groups ($p = 0.033$; student 't' test). All were statistically significant.

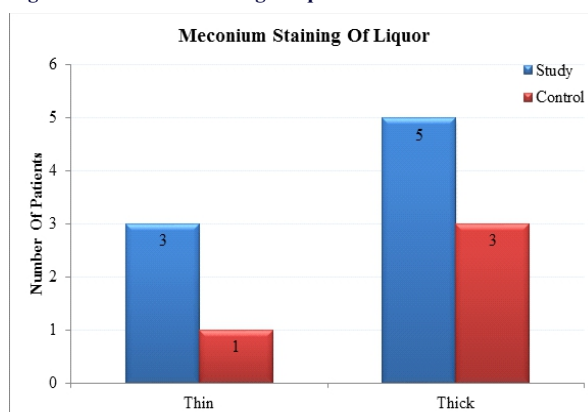
Table 1: Mode of delivery

Mode Of Delivery	Study (n = 30)	Control (n = 30)
SVD	24 (80%)	24 (80%)
Forceps	4 (13.4%)	5 (16.7%)
Vacuum	1 (3.3%)	1 (3.3%)
LSCS	1 (3.3%)	0

In study group, fetal distress was the indication for Cesarean section in 1 patient, forceps delivery in 3 patients (1 low, 2 outlet), and vacuum delivery in 1 patient. 1 patient with poor maternal efforts delivered with low forceps. Hence, interventions were done in 6 patients, 5 for fetal distress and 1 for poor maternal efforts.

In control group, outlet forceps was applied in 2 patients (one fetal distress and one poor maternal effort). Low forceps was applied in 3 patients (2 fetal distress and 1 poor maternal efforts). One patient had vacuum assisted delivery for prolonged second stage. Results were not statistically significant ($p = 0.77$; Chi Square test).

Figure 3: Meconium staining of liquor



In study group, 8 patients had meconium stained liquor, out of which 5 patients had thick meconium. Among these babies, 2 babies APGAR at 5 minutes was < 7 and were given ventilatory support. Both the babies recovered well and were discharged healthy.

In the control group, 4 patients had meconium stained liquor, out of which 3 had thick meconium. None of the babies had respiratory difficulty.

The incidence of meconium stained liquor in both the groups was not statistically significant ($p = 0.399$; Chi square test).

Table 2: Maternal complications

	Study (n = 30)	Control (n = 30)
Injuries	2 (6.7%)	1 (3.3%)
Nausea	9 (30%)	14 (46.7%)
Vomiting	6 (20%)	12 (40%)
Drowsiness	3 (10%)	0
Diarrhoea	2 (6.7%)	0

None of the patients had life threatening complications in both the groups; most of them had nausea and vomiting. Three patients had vaginal mucosal laceration due to instrumental deliveries. They were not statistically significant ($p = 0.116$; Chi square test).

Table 3: Fetal APGAR

APGAR < 7 (no of babies)	Study (n = 30)	Control (n = 30)
1 min	6 (20%)	6 (20%)
5 mins	2 (6.7%)	2 (6.7%)

There was no statistically significant difference in the mean APGAR between the 2 groups at 1 minute ($p = 0.933$; student 't' test) and 5

minutes ($p = 0.894$; student 't' test). Six babies in each group had APGAR < 7 at 1 min, out of which only two babies in each group had APGAR < 7 at 5 minutes which was not significant.

There was no statistically significant difference in the fetal heart pattern amongst the two groups. ($p=0.852$, student 't' test).

Discussion:

Progress of Labour

Rate of Cervical Dilatation (cm/hr)	Our Study (n=30)	Veronica et al (n=30)
Study	4.2	2.3
Control	1.92	1.2

The cervical dilatation progressed at the rate of 4.2 cm/hr in our study which was almost double the rate observed by Veronica et al,¹⁰ Chauhan et al,¹¹ Daftory et al¹² and Meena Jyothi et al¹³ also had similar observations to Veronica. It shows that, in our study, the cervix dilated at a faster rate compared to others.

Duration of Labour

Mean Duration (minutes)	Our Study (n=30)	Golan et al	Veronica et al (n=30)	Meena Jyoti et al (n=100)
1st Stage	140.41	300	240	345

The mean duration of 1st stage of labour was 140.41 minutes in our study which was almost half the duration in studies conducted by Golan et al,¹⁴ Veronica et al,¹⁰ Meena Jyoti et al.¹³

Conclusion:

Drotaverine hydrochloride provides effective cervical dilatation as compared to valethamate bromide, and as a result of which, it significantly reduces the mean duration of labour without increasing the fetomaternal side effects.

References:

- Rosenberg K, Trevathan W. The evaluation of human birth. Sci Am. 2003; 13: 80.
- O'Driscoli K, Stronge JM, Minogue M. Active management of labour. BMJ. 1973; 3: 135-8.
- Etterich M, Mall – Haefi M. The effect of Spasmolytic agent on parturition. Gynaecologia. 1959; 147: 512–21.
- Arulkumaran S, Chua S. Management of first stage of labour. Orient Longman Ltd. 1996; 21–4.
- Meena Thapa, rachana Saha, Amita Pradhan et al. Effectiveness of Drotaverine hydrochloride in progression of labour. N J Obstet Gynecol. 2007 Nov – Dec; 2(2): 9 – 11.
- Roy A, patra K K, Mukhopadhyay S, Gaha S. Study of Drotaverine on first stage of labour and pregnancy outcome. JIMA. 2007 Aug; 105(8):3.
- Mishra S L, Toshniwal A, Banerjee R. Effect of Drotaverine on cervical dilatation ; a comparative study with Epidosin (valethamate bromide). J Obstet Gynecol India. 2002 May–Jun; 52(3): 76–9.
- Singh K C, Jain P, Goel N et al. Drotaverine hydrochloride for augmentation of labour. Int J Gynecol Obstet. 2004 Jan; 84(1): 17–22.
- Sharma J B, Pundir, Kumar A et al. Drotaverine hydrochloride Vs Valethamate bromide in acceleration of labour. Int J Gynecol Obstet. 2001 Sep; 74(3): 255–60.
- Veronica Irene Yuel, Vaneet kaur, Dilpreet kaur . Programmed labor for Optimizing labor and Delivery. J K science. 2008 Apr–Jun; 10(2): 62-64.
- Chauhan R, Gupta A. A clinical study of programmed labour and its outcome. J Obstet Gynaecol & Family Welfare. 2003; 8-9: 5.
- Daftory S N, Desai S V, Nanvati M S et al. Programmed labour – An indigenously developed protocol of labour management. Int J of Gynae and Obstet Ind. 2003; 6: 1.
- Meena Jyoti, Singhal Prabha, Choudhary Devika. Programmed labor. J Obstet Gynecol Ind. 2006; 56(1): 53-55.
- Golan A, Lidor A Wexler S et al. A new method for the management of the retained placenta. Am J Obstet Gynaecol. 1983; 146: 708-9.
- Suvonnakote T, Thitadilok W, Atisook R. Pain relief during labour. J Med Assoc Thailand. 1986; 69: 575-80.