

A Randomized Double-Blind Controlled Trial Comparing Efficacy of Epidosin and Drotaverine for Faster Cervical Dilatation in Active Labour

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Abstract

Prolonged labour is one of the important causes of maternal and neonatal mortality and morbidity. Both Drotaverine hydrochloride and Epidosin exert their main effect on the cervix, facilitating its dilatation and thus, can be used for augmentation of labour. The present study is conducted to compare the efficacy of Epidosin and Drotaverine for faster cervical dilatation in active labour. This was a prospective study conducted in a tertiary center over 1 year. All the 90 patients who reported to the department during the study period & were fulfilling the inclusion criteria were enrolled in the study. They were randomly assigned to group 1, 2, and 3. The group as per protocol. In primigravida and multigravida, the mean duration of the active phase of the first stage of labor was highest in the control group followed by injection Epidosin least in the injection drotaverine group. On statistical analysis, this difference in the mean duration of the active phase of the first stage of labor between the groups was found to be statistically significant (p -value < 0.001). The study concluded that the mean duration of the active first stage of labor was short with Drotavarine & Epidosin group as compared to the control. Thus, both injection drotaverine hydrochloride and Epidosin are effective in the acceleration of labor. However, drotaverine accelerates labor more rapidly and is a safe & potent drug without any significant fetal or maternal side effects for shortening the labor.

Keywords: Epidosin, Drotaverine, labor, cervical dilatation.

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Introduction

Improving maternal health and reducing maternal mortality is one of the main health concerns worldwide[1]. Prolonged labour is one of the important causes of maternal and neonatal mortality and morbidity. It can lead to increased risks of maternal exhaustion, postpartum haemorrhage and sepsis, fetal distress, and asphyxia and requires early detection and appropriate clinical response[2]. The concept of “active

management of labour” was developed by O'Driscoll in 1973 to assure a woman that her labour would not exceed 12 hours³. Active management of labour includes accurate and early diagnosis of the first stage of labour, early artificial rupture of membranes, augmentation of labour with oxytocin, and use of anti-spasmodic drugs[4].

Today, various drugs are available for shortening the duration of labour which act either by increasing the uterine contractions or by accelerating the rate of cervical dilatation thus reducing chances of prolonged labour[5]. Some of the drugs that have been used are Hyoscine N butyl bromide, Phloroglucinol, Camylofin dihydrochloride, Drotaverine, and Valethamate bromide (Epidosin)⁴. Epidosin has neurotropic and musculotropic actions that result in relaxation of the cervical muscles leading to the dilatation of the cervix[6]. Drotaverine is a relatively newer spasmolytic which acts by inhibiting phosphodiesterase IV enzyme & is primarily used to relieve gastrointestinal and renal colics. It also causes cervical dilatation without side effects[7].

Both Drotaverine hydrochloride and Epidosin exert their main effect on the cervix, facilitating its dilatation and thus, can be used for augmentation of labour. Shortening the duration of the painful first stage of labour without having any effect on the mother and foetus is the ultimate goal of obstetricians. The present study is conducted to compare the efficacy of Epidosin and Drotaverine for faster cervical dilation in active labour.

Methodology

This was a prospective study conducted in a tertiary center over 1 year. All the 90 patients who reported to the department during the study period & were fulfilling the inclusion criteria were enrolled in the study after taking their informed, written, and valid consent. Complete physical & obstetric examination, routine investigations were performed in all cases. Patients were shifted to labour room after they entered into the early active phase of labour. They were randomly assigned to groups 1, 2, and 3 by computer-generated randomization and the time was noted:

Group 1- 30 patients (15 primigravida and 15 multigravida) – control group (no drug given).

Group 2- 30 patients (15 primigravida and 15 multigravida) – valethamate bromite (EPIDOSIN) group (Injection epidosin 8 mg was given intramuscular, starting at 3 cm cervical dilatation, and repeated 1 hourly to a maximum of 3 doses).

Group 2- 30 patients (15 primigravida and 15 multigravida) – drotaverine (DROTIN) group (Injection drotaverine 40 mg was given intramuscular at intervals of 3 hours, starting at 3 cm cervical dilatation, and a maximum of 3 doses were given).

2 hourly per vaginal examinations were carried out to assess the progress of labor. The neonatal and maternal side effects were observed. APGAR score was taken at 1 min, 5 min and at 10 min. Following maternal side effects were noted headache, dryness of mouth, palpitations, flushing of mouth, and vomiting.

Data were entered in Microsoft excel & were analysed using PRIMER software. Qualitative data were represented as proportions & percentages and quantitative data was represented as mean & standard deviation.

Inclusion criteria-

Women at 37-41 weeks of pregnancy in labor with foetus in vertex presentation, effective uterine contraction, good cervical effacement & 3 cm cervical dilatation.

Exclusion criteria-

Women with previous uterine scars, malpresentation, multiple pregnancies, cephalopelvic disproportion, preeclampsia, antepartum hemorrhage, meconium-stained amniotic fluid, contraindication to use of injection Drotaverine and or injection Epidosin.

Result

The average age in primigravida patients in the drotaverine group was 23.33 ± 3.288 years whereas in multigravida it was 29.67 ± 3.773 years. The average age in primigravida patients in the epidosin group was 25.80 ± 3.29 years whereas in multigravida it was 29.53 ± 3.98 years. The

average age in primigravida patients in the control group was 24.93 ± 3.731 years whereas in multigravida it was 30.33 ± 3.958 years (Table 1).

In primigravida, the mean duration of the active phase of the first stage of labor was highest in the control group (261.33 ± 20.391 min) followed by injection Epidosin (157.60 ± 25.726 mins) least in the injection drotaverine group (122.33 ± 15.66 mins). On statistical analysis, this difference in the mean duration of the active phase of the first stage of labor between the groups was found to be statistically significant (p -value < 0.001) (Table 2).

In multigravida, the mean duration of the active phase of the first stage of labor was highest in the control group (228.93 ± 21.81 min) followed by injection Epidosin (152.07 ± 15.43 mins) and least in the injection drotaverine group (116.13 ± 15.07 mins). On statistical analysis, this difference in the mean duration of the active phase of the first stage of labor between the groups in multigravida was found to be statistically significant (p -value < 0.001) (Table 2).

The rate of cervical dilatation among primigravida in this study was 2.1 cm/hr, 2.9 cm/hr, and 3.54 cm/hr in the control, Epidosin, and Drotavarine group respectively. In multigravida, rate of cervical dilatation was 4.28 cm/hr in control group, 3.21 cm/hr in injection Epidosin and 2.49 cm/hr in injection Drotavarine group (Table 3).

In primigravida, the mean duration of the second stage of labor in the control group was 23.80 ± 1.08 mins, and the mean duration of the third stage of labor was 7.53 ± 0.52 mins. In the injection Epidosin group, the mean duration of the second stage & third stage of labor was 23.80 ± 1.08 mins & 7.53 ± 0.52 mins respectively. Among primigravida females in the Drotavarine group, the mean duration of the second stage & third stage of labor was 22.20 ± 1.656 mins & 6.33 ± 0.62 mins respectively (Table 4).

In multigravida, the mean duration of the second and third stage of labor in the control group was 19.53 ± 0.92 mins and 6.47 ± 0.52 mins respectively. In the injection Epidosin group, the mean duration of the second stage & third stage of labor in multigravida was 17.53 ± 0.74 mins & 7.40 ± 0.63 mins respectively. Among multigravida females in the Drotavarine group, the mean duration of the second stage & third stage of labor was 16.33 ± 1.23 mins & 5.83 ± 0.594 mins respectively (Table 4). 5.83 ± 0.594 mins respectively (Table 4).

The adverse effects like palpitations (13.33%), vomiting (10%), Dryness of mouth (23.33%), and headache (10%) were noted in the injection Epidosin group while with injection Drotavarine palpitations (6.67%), vomiting (0%), Dryness of mouth (6.67%) and headache (3.33%) were noted. There were no observed side effects in the neonates in all three groups.

Table 1: Mean age (in years) among the groups

Gravidity	Mean age (in years)		
	Drotavarine	Epidosin	Control
Primigravida	23.33 ± 3.288	25.80 ± 3.29	24.93 ± 3.731
Multigravida	29.67 ± 3.773	29.53 ± 3.98	30.33 ± 3.958

Table 2: Duration of active phase of first stage of labor

Gravidity	Groups	Mean Duration of 1st stage of labour	p-value
Primigravida	Drotaverine	122.33±15.66	F=177.579, df=2, p value<0.001
	Epidosin	157.60±25.726	
	Control	261.33±20.391	
Multigravida	Drotaverine	116.13±15.07	F=158.800, df=2, p value<0.001
	Epidosin	152.07±15.43	
	Control	228.93±21.81	

Table 3: Rate of cervical dilatation among the groups

Gravidity	Rate of cervical dilatation (cm/hr)		
	Drotavarine	Epidosin	Control
Primigravida	3.54	2.9	2.1
Multigravida	4.28	3.21	2.49

Table 4: Duration of the second and third stages of labor.

Gravidity	Groups	Mean Duration of 2nd stage of labor	Mean Duration of 3rd stage of labor
Primigravida	Drotaverine	22.20±1.656	6.33±0.62
	Epidosin	22.53±1.25	6.87±0.74
	Control	23.80±1.08	7.53±0.52
Multigravida	Drotavarine	16.33±1.23	5.83±0.594
	Epidosin	17.53±0.74	7.40±0.63
	Control	19.53±0.92	6.47±0.52

Discussion

Labor pain is the most excruciating pain experienced by women. Thus, expediting the process of labor to shorten its duration without affecting the health of the mother and fetus is the main aim. Drotaverine hydrochloride and Epidosin are the antispasmodics that facilitate cervical dilatation and can be used for shortening the duration of labor. In this study, 90 women were included and they were randomized into three groups to compare the efficacy of Drotaverine & Epidosin in shortening the duration of labor.

In the present study, the average age in primigravida patients in the drotaverine group was 23.33±3.288 years whereas in multigravida it was 29.67±3.773 years. The

average age in primigravida patients in the epidosin group was 25.80±3.29 years whereas in multigravida it was 29.53±3.98 years. The average age in primigravida patients in the control group was 24.93±3.731 years whereas in multigravida it was 30.33±3.958 years. These results were similar to the study conducted in Amritsar by D. Kaur et al, who stated that the average maternal age in the Epidosin group was 25.18±4.08 years and in the Drotaverine group was 24.97±3.90 years[8]. PR Changede in their study reported that the average age in primigravidae patients in the control group was 23.4yrs whereas in multigravida it was 25.9yrs. The average age in primigravida patients in the valetamate bromide group was 24.6yrs whereas in multigravida it was

26yrs. The average age in primigravida patients in the drotaverine group was 25.9yrs whereas in multigravida it was 28.2yrs[3].

In our study, the mean duration of the active phase of the first stage of labor in primigravida was maximum (261.33±20.391 min) followed by injection Epidosin (157.60±25.726 mins) minimum in the injection drotaverine group (122.33±15.66 mins). In multigravida, the mean duration of the active phase of the first stage of labor was highest in (228.93±21.81 min) followed by injection Epidosin (152.07±15.43 mins) least in the injection drotaverine group (116.13±15.07 mins). This was statistically significant (p-value < 0.001). These were comparable to the study conducted by Changede PR, who reported that in primigravida the mean duration of the active phase of the first stage of labor was 229.7 min, 156.7 min, and 110.7min in control group injection, valethamate group, and injection drotaverine group respectively. In multigravida, the mean duration of the active phase of the first stage of labor was 173.2 min, 126.3 min, and 96.2 min in the control group injection, valethamate group, and injection drotaverine group respectively. This difference was statistically significant (p-value<0.05)[3].

In a study conducted in Rohtak by Khosla AH, the mean duration of the first stage of labor in primigravida patients was 145min, 208min, and 318min in epidosin, drotaverine, and control group respectively.8 In the case of multigravida patients it was 104min, 112min, and 230min in epidosin, drotaverine, and control group respectively. In their study, Valethamate bromide was significantly more effective than drotaverine in primigravida patients but not in multigravida patients[9].

In the study conducted by Sinhasane H et al. on 600 pregnant females of Karnataka, the mean duration of 1st stage in primigravida was 230±159 mins with

drotaverine as compared to valethamate which was 265±196.5 and 375±194 mins in the control group and this was significantly shorter(P<0.05). Similarly, in multigravidas, it was 149±61.5 mins with drotaverine as compared to Epidosin which was 201±111.5 mins, and a control group which was 313±161 mins. Thus, concluded that Drotavarine and Epidosin both are potent spasmolytics but drotavarine is better[10].

Roy A in his study observed that the mean duration of the active phase of labor in primigravida and multigravida were 148.9 minutes and 99.5 minutes in the drotaverine group whereas in the control group were 331.6 minutes and 227.9 minutes respectively. He concluded that drotaverine was highly effective[11].

The rate of cervical dilatation among primigravida in this study was 2.1 cm/hr, 2.9 cm/hr, and 3.54 cm/hr in the control, Epidosin, and Drotavarine group respectively. In multigravida, rate of cervical dilatation was 4.28 cm/hr in control group, 3.21 cm/hr in injection Epidosin and 2.49 cm/hr in injection Drotavarine group. This was comparable to the study done by SM Selvaraj et al., the rate of cervical dilatation was higher in drotaverine hydrochloride (2.2 cm/hr) and valethamate bromide (1.68 cm/hr) compared with the control group (1.11 cm/hr). There was a significant shortening of the duration of the second stage of labour in the drotaverine hydrochloride group (21.2 minutes) and valethamate bromide group (22.74 minutes) when compared with the control group (30.94 minutes)[12].

In a study done by Sinhasane H et al., who reported that the rate of cervical dilatation in primigravida females was more (1.83 cms) in the Drotavarine group as compared to Epidosin which is 1.58 cms and control group in which it was 1.12 cms. Similarly, in multigravidas, it is 2.82 cms with Drotavarine, 2.08 cms with Epidosin, and 1.34 cms in controls[10].

The mean duration of the second stage of labor among primigravida in the control group was 23.80 ± 1.08 mins. In the injection Epidosin group, the mean duration of the second stage was 23.80 ± 1.08 mins & in the Drotavarine group, the mean duration of the second stage was 22.20 ± 1.656 mins. In multigravida, the mean duration of the second stage was 19.53 ± 0.92 mins. In the injection Epidosin group, the mean duration of the second stage of labor in multigravida was 17.53 ± 0.74 mins. & in the Drotavarine group, the mean duration of the second stage of labor was 16.33 ± 1.23 mins. This was in resonance with the study done by Sinhasane H et al., who stated that there was a significant shortening of the duration of the second stage of labour in the drotaverine hydrochloride group (21.2 minutes) and valethamate bromide group (22.74 minutes) when compared with the control group (30.94 minutes)[10].

In the current study, adverse effects like palpitations (13.33 %), vomiting (10%), Dryness of mouth (23.33%), and headache (10%) were noted in injection Epidosin group while with injection Drotavarine these side effects were minimum, palpitations (6.67 %), vomiting (0%), Dryness of mouth (6.67%) and headache (3.33%) were noted. Changede PR showed that in their study, the headache was present in 4 patients, dryness of mouth in 5 patients, flushing was observed in 5 patients out of 30[3]. Kuruvila S in his study found that 72 patients that received valethamate bromide (Epidosin) had side effects such as tachycardia 5.6%, dry mouth 8.3%, flushing 9.7%, fever 1.4%, headache 4.2%, and vomiting 6.9%[13].

Conclusion

The study concluded that the mean duration of the active first stage of labor was short with Drotavarine & Epidosin group as compared to the control. Also, in each group, the rate of cervical dilatation was faster in multigravida patients as compared to primigravida and it was fastest in the drotaverine group. Thus, both injection

drotaverine hydrochloride and Epidosin are effective in the acceleration of labor. However, drotaverine accelerates labor more rapidly and is a safe & potent drug without any significant fetal or maternal side effects for shortening the labor.

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