Original Article

Effect of Different Doses of Phloroglucinol on 1st Stage of Labour in Term Pregnancies

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Abstract

Objective: To observe the effect of different doses of Phloroglucinol on the duration of labour whether a 160 mg dose is better than a 40 mg dose or vice versa and to find their effects on mother and fetus.

Methodology: It was randomized clinical trial study conducted in Department of obstetrics and Gynecology, Unit-I, Holy Family Tertiary Hospital, Rawalpindi. Non probability consecutive sampling was used for the purpose of data collection. 102 Primigravida females were included in this study. Patients were randomly divided into two groups. Group A received Phloroglucinol 40 mg (4ml) i/v at 4cm dilation of cervix and patients in Group B received Phloroglucinol 160 mg i/v in total, dose administered as 40 mg (4ml) i/v at 4cm cervical dilation of cervix and 40 mg (4ml) after 1 hour of 1st dose than 80mg (8ml) after 2hours of 1st dose. Data was collected on structured designed proforma.

Results: Mean age (years) in both the groups was 25.43+3.00 and 25.29+3.66 respectively, whereas the mean gestational age (weeks) in both the groups was 38.45+0.70 and 38.74+1.36 respectively. The duration (hours) of labour at the first stage was 6.11+3.25 and 3.61+1.65, both of which were statistically significant (p-value 0.000), whereas the duration (hours) of labour at the second stage was 1.94+2.24 and 0.56+0.52, both of which were statistically significant (p-value 0.000).

Conclusion: The study concludes that Phloroglucinol can effectively improve labour progress and shorter duration of labour and its dose of 160 mg shortens the active phase of labour more effectively than 40mg dose. So 160 mg Phloroglucinol is preferred by intravenous injection as compared to 40mg dose, which has great value in clinical gynecological applications.

Keywords: Phloroglucinol, Dilatation, pregnancy, cervical effacement, spasmolytic

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Introduction

For a long time, it has been known that prolonged labour is dangerous for both the mother and the fetus. The mother is exposed to a high risk of infection, ketosis, DIC and obstructed labour while the fetus faces the danger of infection, asphyxia, excessive cranial moulding and fetal death.[1] Labour lasting for more than 12 hours in Primigravida and 8 hours in multiparous women is regarded as prolong labour. The safety of active management of labour has been demonstrated by several prospective randomized clinical trials involving over 3000 women.[2.] Active management of labour is associated with low incidence of prolonged labour and low cesarean section rate.[3] Active management of labour refers to active control rather than passive observation over the course of labour by obstetric provider. Causes for prolong labour are multifactorial and cervical dilation is the end result of these factors.[1] Several methods to increase uterine contractions, such as amniotomy and the use of oxytocin, are used to expedite labor, but these methods are not without complications.[4]

Spasmolytic and spasm analgesic mixtures are administrated in facilitate dilation of cervix during delivery and to shorten the first stage of labour[5] Phloroglucinol is one of spasmolytic, primarily used for gastrointestinal tract colic.[7] Phloroglucinol is a smooth

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muscle relaxant. Spasmolytic drugs are frequently use to overcome cervical spasm and thus reduce the duration of labour[6] Phloroglucinol can be used to relieve the spasm and edema of cervix and lower the tension of cervix muscle. So it is proved that shorten the duration of labour.[1] One of the international study shows that 160 mg of Phloroglucinol is better over 40 mg of i/v Phloroglucinol in reducing the duration of 1st stage of labour[8]. To best of our knowledge, local statistics of said such study are not available, hence this study will surely help the gynecologist. The objective of this project is to access the effect of different doses of Phloroglucinol in seeing the cervical dilation with labour augmentation and to determine any associated increase in complications such as increase of blood loss, decreases in neonatal Apgar score. This study is to observe the effect of different doses of Phloroglucinol on duration of labour whether 160 mg dose is better than 40 mg dose or vice versa and to find their effects on mother and fetus.

Methodology

It was randomized clinical trial study conducted in the Department of obstetrics and Gynaecology, Unit-I, Holy Family Tertiary Hospital, Rawalpindi keeping in view the inclusion and exclusion criteria. Patients were divided into 02 groups. Permission from the hospital ethical committee was taken and consent was taken from all patients. The duration of study was 06 months i.e. Nov 2017 to May, 2018. Non probability consecutive sampling was used A total of 102 patients were included in the study (i.e. 51 patients in each group). The sample size was determined by using WHO sample size calculator with the following calculations: level of significance = 5%, power of test = 80%, Pooled standard deviation = 13.5, Test value of the population mean = 358.64[7], anticipated population mean = 603.75[7]. The first stage of labour was defined as the time between the onset of labour and full cervix dilation. phase when it is from 4cm to 10 cm dilation with acceleration of labour of duration of 1st stage of labour as rate of cervical dilation per hour (cm/hour). Different doses of Phloroglucinol: 40mg verses 160mg was given. Inclusion criteria of the study included Woman age 18-32 years, primigravida, Singleton pregnancy, with vertex presentation, at term (GA = 37 to 42 weeks), in-active phase of uncomplicated labour and spontaneous labour either with intact membrane or SROM less than 12 hour ; whereas those women who presented with 'any contra indication with vaginal delivery like CPD, placenta praevia, Multiparous, Multiple gestation, Preterm, PROM more than 12 hours, Induced labour, Previous uterine rearing, APH, Epidural analgesia and any obstetrical, surgical medical complication like eclampsia' were excluded from the study. Initial evaluation was done by taking complete history, GPE, systemic examination per abdominal and per vaginal examination was done at time of admission to assess the status of labo0r. Routine investigations (Blood CP, urine R/E, BSR, Blood groups, hepatitis profile, CTG) were carried out. A specially designed proforma was used for data collection; sample proforma is attached at the end. Patients were chosen randomly. : Group A received Phloroglucinol 40 mg (4ml) i/v at 4cm dilation of cervix and patients in Group B received Phloroglucinol 160 mg i/v in total , dose administered as 40 mg (4ml) i/v at 4cm cervical dilation of cervix and 40 mg (4ml) after 1hour of 1st dose than 80mg (8ml) after 2hours of 1st doses. Uterine contractions, vitals, FHR was monitored half hourly. Progress of labour was plotted or partogram. Primary outcome included Duration of labour in 02 different groups of patient whereas secondary outcome include 1).rate of cervical dilation, which is, an 'amount of blood loss after 2nd stage (primary PPH): Blood loss more than 500 ml (clinical assessment) was considered abnormal'. 2) any maternal side effect (dry mouth, Blurring of vision, nausea , vomiting , palpitations). 3) APGAR score at 1 and 5 minutes was note in terms of poor, good and excellent. Follow-up the patient was done till 24 hours after delivery. All data pertaining to labour events maternal and neonatal outcome, adverse effects of drug dose, mode of delivery was recorded. Data was entered and analyzed in SPSS version 23.0. Frequency and percentage was calculated for qualitative variables like nausea, vomiting, drug mouth, blurring of vision and palpitation. Mean and standard deviation was calculated for quantitative variables like age, gestational age, duration of active labour, blood loss, Apgar score for both doses was measured. Independent sample t-test was applied in comparing duration of labour (1st and 2nd stage) among both the groups. $P \leq 0.05$ was taken as level of significance.

Results

Total 102 patients were included in the study according to the inclusion criteria of the study. Patient were randomly divided into two equal groups; Group A and Group B. Table II showed descriptive statistics of patients. Mean age (years) in both the groups was 25.43 ± 3.00 and 25.29 ± 3.66 respectively, whereas mean gestational age (weeks) in both the groups was 38.45 ± 0.70 and 38.74 ± 1.36 respectively. No patient of

primary postpartum hemorrhage was observed during the study, whereas majority of the women were delivered by spontaneous vaginal delivery 36 (70.6%) and 41 (80.4%) in both the groups respectively. Neonatal outcome in terms of Apgar score at 1 minute and 2nd minute was good in both the groups respectively. No side effects in terms of Bluring of vision and vomiting was observed in the patients, however nausea was noted among 0 (0.0%) and 03 (5.9%) in both the groups respectively. Duration (hours) of labour at 1st stage was 6.11±3.25 and 3.61±1.65 respectively which was statistically significant (p-value 0.000), whereas duration (hours) of labour in 2nd stage of labour was 1.94±2.24 and 0.56±0.52 respectively which was statistically significant (p-value 0.000), as shown in Table II.

Table I:Descriptive statistics of variables

		Group A (n=51)	Group B (n=51)
Age (years)		25.43±3.00	25.29±3.66
Gestational Age (weeks)		38.45±0.70	38.74±1.36
Primary PPH	Yes	1 (2.0)	0 (0.0)
	No	50 (98.0)	51 (100.0)
Mode of Delivery	EMLSCS	0 (0.0)	02 (3.9)
	LSCS	2 (3.9)	1 (2.0)
	OFD	11 (21.6)	6 (11.8)
	SVD	36 (70.6)	41 (80.4)
	Vaccum	2 (3.9)	1 (2.0)
APGAR score (1 min)	Poor	0 (0)	0 (0)
	Good	51 (100)	51 (100)
	Excellent	0 (0)	0 (0)
APGAR score (5 min)	Poor	0 (0)	0 (0)
	Good	51 (100)	80 (100)
	Excellent	0 (0)	0 (0)
Complaints			
Nausea	Yes	0 (0)	3 (5.9)
	No	51 (100.0)	48 (94.1)
Vomiting	Yes	0 (0.0)	0 (0.0)
	No	51 (100.0)	51 (100.0)
Bluring of vision	Yes	0 (0)	0 (0)
	No	51 (100.0)	51 (100.0)
Palpitation	Yes	0 (0)	1 (2.0)
	No	51 (100.0)	50 (98.0)

Table II: Comparison of Duration of Labour in both the groups

	Group A	Group B	P-value*
Duration of 1st stage of labour	6.11±3.25	3.61±1.65	0.000
Duration of 2nd stage of labour	1.94±2.24	0.56±0.52	0.000

*P≤ 0.05 was taken as level of significance

Discussion

The main causes of prolonged labour are inefficient uterine contraction, cephalopelvic disproportion, and abnormal fetal presentation.[9] In patients having their first labour is more prolonged than multipara. This prolong labour increases this significant risk to both mother and fetus. In maternal risks prolong obstructed labour and ruptured uterus account for 70 percent of all maternal death and 7-15 percent risk of fetal demise has been attributed to obstructed labour. In developing countries, risk of vesicovaginal fistula is 55-80 per 100,000 live birth.[10]

This increase in the duration of the second stage of labour is important as it has beneficial effects on the increase in overall rate of vaginal births without adversely affecting neonatal morbidity. However, incidence of operative vaginal delivery, anal sphincter tears, post partum haemorrhage and emergency caesarean deliveries increased.[11,12,13,14] Rate of caesarean deliveries have risen in past two decades and this is correlated with rise in second stage caesarean deliveries related to decrease in use of instrumental deliveries.[15] O'Driscoll at the National Maternity Hospital, Dublin, introduced the concept of active management of labour.[16] With adoption of active management of labour the maternal morbidity has reduced significantly in terms of lower rate of prolonged labour and low cesarean section rate.[17]

Phloroglucinol compounds comprise of extended family includes various synthetic and semi-synthetic compounds. It contains 1,3,5-trihydroxy benzene as the basic moiety, which has anticancer, anti-microbial, anti-inflammatory, anti-allergic, enzyme inhibitory, antioxidant and neuro-regenerative properties. Phloroglucinol (spasfon) has smooth muscle relaxing properties, which act as spasmolytic.[18]

This phloroglucinol facilitate the dilatation of cervix in labour, so it tends to shorten the first stage of labour, which in turn decreases the total duration of labour. Phloroglucinol is used in 70 percent of deliveries at the 1st Dept. of Obstetrics and Gynaecology Masaryk University in Brno.[19]

Study compare Phloroglucinol with placebo and concluded that duration of labour including first stage and second stage reduces significantly while no effect of drug found on third stage of labour.[20] Similar results were also found in other studies that Phloroglucinol is effective in reducing duration of labour. There was no

difference in maternal and foetal outcomes between the two groups [21,22]

Another study conducted by Tasnim Tahira and colleagues to find the effect of Phloroglucinol versus drotavernie effect on duration of labour found that with the use of phoroglucinol first stage of labour is 20 minutes shorter as compared with use of drotavernie. This difference was statistically significant between two groups with p-value = 0.003.[23] Similar results were also found in another study conducted by Shah Muhammad Khan to compare effect of phloroglucinol versus drotavernie. [24]

Hao Y[25] and colleagues observed the effects of Spasfon on improving dilatation of cervix and promoting the progression of labour. They study the impact of different drugs including spasfon versus atropine on duration of labour in nulliparous patients. In their study 97 primiparae were randomly divided into spasfon group (n=46, Group-A) and atropine group (n=51, Group B) when cervix dilated 2-3cm. Group A was given 80 mg of Spasfon intravenously, and group B was injected atropine 0.5 mg into the cervix. The average time from drug administration to full dilation of the cervix was found (3.1 +/- 0.3) h in group A, and (4.4 +/- 0.4) h in-group B (P <0.01). The disappearance ratio of cervical edema after administration of drugs is better in group A as compare to group B (was 95.6 percent for group A and 90.2 percent in group B) with P>0.05. The mean dilatation of cervix between the 2 hours in group A was (4.3 +/- 0.2) cm, while in group B it was (2.5 +/- 0.3) cm (P value <0.01). No side effects observed in-group A while in group B 22 female complained of increase heart rate along with fetal tachycardia which settle in an hour and eight women complain of thirst. Vaginal delivery rate in group A was 95.7%, and 90.2% in group B (P value >0.05), this shows that phloroglucinol as compare to atropine is better in improving cervical dilatation and with low after effect profile so it is well tolerated by both mother and fetus.

The results of our study are also in agreement with the Hao Y and Zahi HR[25] as we also found significant difference in our patients administered with ploroglucinol 40 mg and 160mg doses. The patients administered with 160mg phloroglucinol had a significantly shorter duration of 1st and 2nd stage of labour. Our results are also in agreement with a local study by Tabassum[1] where patients receiving Phloroglucinol had mean 34% reduction in duration of 1st stage of labour and a 23% mean reduction in 2nd stage as compared to Placebo group respectively while no adverse effects was found to the mother or foetus. Dong Julang, Huang Hao, Cao Qiong also found in their study named as 'Preliminary Study on the Effect of Phloroglucinol Dosage on Delivery Process' that 160mg of phloroglucinol is more effective in reducing the duration of labour as compared to 40 mg, as in consistent with our study. [8]

Conclusion

The study conclude that Phloroglucinol can effectively improve labour progress and shorter duration of labour and its dose of 160 mg shorten active phase of labour more effectively than 40mg dose. So 160 mg Phloroglucinol is preferred by intravenous injection as compare to 40mg dose, which has great value in clinical obstetrical applications.

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