Original Article

Role of Phloroglucinol in Reducing Duration of Active First Stage of Labour

Fariha Saleem[1], Talat Parveen[2], Ghulam Zainab[3], Khiaynat Sarwar Hashmi[4]

[1]Senior Registrar, Department of Obstetrics & Gynaecology, Shahida Islam Medical and Dental College Lodhran
[2]Assistant Professor, Department of Obstetrics & Gynaecology Bahawal Victoria Hospital Bahawalpur
[3,4]Senior Registrar, Department of Obstetrics & Gynaecology Bahawal Victoria Hospital Bahawalpur

Correspondence: *Dr Khiaynat Sarwar Hashmi*
Registrar, Department of Obstetrics & Gynaecology
Bahawal Victoria Hospital Bahawalpur
ksarwar61@gmail.com

Abstract

Objective: To compare the effectiveness of phloroglucinol in reducing the duration of the active first stage of labour.
Methodology: This randomized controlled trial was carried out from May 2023 and October 2023 at Department of Obstetrics & Gynaecology at Bahawal Victoria Hospital, Bahawalpur. Patients with singleton pregnancies in the active first stage of labour, without complications, aged between 18 and 40 years and within the term range of 37 to 42 weeks of gestation were included. Group A received intravenous phloroglucinol 40mg (4ml), while Group B received an intravenous placebo (4ml) at the start of the trial. Following the initial dose, another administration was given after 30 minutes, and both the patient and observer remained unaware of the injection's contents. Subsequently, labour progression was carefully monitored. All collected data were entered into SPSS version 26.
Results: The mean duration of the first stage of labour in the phloroglucinol group was 210.20 ± 56.96 minutes, while in the placebo group, it was 323.30 ± 55.07 minutes ($p<0.0001$). These findings align with previous studies demonstrating the efficacy of phloroglucinol in reducing the duration of labour. Notably, shorter labour durations were not associated with adverse maternal or neonatal outcomes.
Conclusion: Phloroglucinol observed as an effective treatment option for reducing the duration of the active first stage of labour.
Keywords: Prolonged labour, phloroglucinol, cervical dilation, labour duration, perinatal outcomes, antispasmodics.

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Introduction

Prolonged labour is a concern associated with increased maternal and neonatal mortality and morbidity. Factors contributing to its occurrence are multifaceted, including maternal age, labour induction, membrane rupture, early hospital admission, epidural use, and maternal stress hormones. Antispasmodics administered during labour hold promise for expediting cervical dilation.

Labour is a natural bodily process involving the strengthening of myometrial contractions, the widening of the cervix, and effacement, ultimately resulting in the delivery of the baby and placenta, and the onset of lactation. The initial stage of labour in first-time pregnant individuals typically lasts about 12-16 hours, while in women who have given birth before, it usually ranges from 6-8 hours.[1,2] Extended labour is linked to numerous negative outcomes for both the mother and the fetus. The mother often faces an increased risk of obstructed labour, postpartum hemorrhage (PPH), infection, perineal trauma, the requirement for a cesarean section, and maternal mortality, while the fetus is at risk of asphyxia, different types of birth-related injuries, infection and perinatal mortality.[3-5] Effective management of labour is associated with decreased instances of prolonged labour and decreased rates of cesarean sections.[6,7] Encouraging and implementing strategies to expedite labour while ensuring the health and safety of both mother and baby is beneficial for everyone involved. Over time, various approaches have been employed to enhance uterine contractions and shorten the duration of labour.[7] Numerous research findings indicate that actively managing labour can lead to a reduction in its duration, with evidence supporting the safety of this approach. Mechanical, pharmaceutical,

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and non-pharmaceutical elements can all aid in cervical dilation.[8] Certain techniques such as amniotomy, the administration of prostaglandin analogs like misoprostol, and the use of oxytocin are among those employed.[9,6]

While these methods can expedite cervical dilation and reduce labour duration, they are frequently linked to negative outcomes for both the mother and fetus, such as uterine rupture, postpartum hemorrhage, fetal distress, and fetal asphyxia. Antispasmodics could offer a viable solution. The preferred antispasmodic for enhancing cervical dilation should exhibit both prompt and durable effects, while posing no negative impact on uterine contractions and carrying no risk of causing rupture of the uterus. Additionally, it should have minimal adverse effects on both the mother and the fetus.[6]

Phloroglucinol serves as the myotropic antispasmodic that only affects smooth muscle in the gastrointestinal and genitourinary systems, with little effect on healthful smooth muscle tissues.[10] Current studies using Phloroglucinol have demonstrated great success in increasing cervical ripening and softening, with encouraging results.[10-12] Numerous investigations have looked into the impact of Phloroglucinol on labor management, providing optimistic results.

Phloroglucinol's ability to promote cervical dilatation while maintaining uterine contractility suggests that it could be a useful supplement in hastening labor. Furthermore, its good safety profile, which includes minimal negative effects on both maternal and fetal well-being, supports its potential for incorporation into obstetric care practices. Given the difficulties resulting from extended labor, such as increasing maternal discomfort, drowsiness and the likelihood of negative maternal and fetal consequences, the use of Phloroglucinol as a supplementary intervention has significant potential. Phloroglucinol possesses the potential to improve mother and fetal well-being while maximizing obstetric outcomes by providing a safe and effective way to induce labor. However, more research into its effect in shortening the length of the active initial stage of labor has recently been suggested.[6,12]

However, this study desires to analyze the influence of phloroglucinol on shortening the active first stage of labor durations in the local population by contrasting its effectiveness to a control group during the first stage of labor.

Methodology

This randomized controlled trial was carried out during six months from May 2023 and October 2023 at Department of Obstetrics & Gynaecology at Bahawal Victoria Hospital, Bahawalpur. Sixty participants with singleton pregnancies in the active first stage of labour, without complications, aged between 18 and 40 years and within the term range of 37 to 42 weeks of gestation were engaged. Exclusion criteria included multiple pregnancies, previous obstetric or surgical complications, and medical histories of heart rhythm abnormalities, heart failure, or asthma and those who did not want to participate in the study. All participating women provided informed consent after receiving a thorough explanation of the study's aims and objectives, with assurances of confidentiality regarding their information.

Patients meeting the inclusion criteria were randomly assigned in a double-blind fashion to one of two groups. Each patient randomly selected a slip from a pool of shuffled slips, half labeled ‘A’ and the other half labeled ‘B.’ Group A (the study group) comprised 30 cases who received intravenous phloroglucinol 40mg (4ml), while Group B (the control group) consisted of 30 cases who received an intravenous placebo (4ml) at the start of the trial. Following the initial dose, another administration was given after 30 minutes, and both the patient and observer remained unaware of the injection's contents. Subsequently, labour progression was carefully monitored, including regular assessment of uterine contractions and fetal heart rate every thirty minutes. The course of labour was documented for each group. All collected data were entered into SPSS version 20.0 for analysis. Mean and standard deviation were calculated for age, gestational age, and the duration of the first stage of labour, while parity was assessed in terms of frequency and percentage. A comparison of the mean duration of the first stage of labour between the two groups was carried out using a student ‘t’ test, with a significance level set at $p \leq 0.05$.

Results

In group A, the average age was 27.27±6.26 years, while in group B, it was 29.37±5.24 years. A significant proportion of patients, 49 (61.25%), were between 18 and 30 years old. The mean gestational age in group A was 37.85±2.40 weeks, and in group B, it was 38.15±1.21 weeks. The majority of patients, 47 (58.75%), had a gestational age between 38 to 40 weeks. There was no significant difference in age according to the study groups (p->0.05). Regarding parity, there were similar distributions across both

groups, with no significant variation observed among different parity categories (p=0.987). Table I

Regarding socioeconomic status and literacy rate both groups had no statistically significant difference Table I

Table I: Age groups and parity comparison in both groups (n=80)

Variables		Study group		p-value
		Case group	Control group	
Age of the patients	18-30 years	24(60.0%)	25(63.0 %)	0.64
	>30 years	16(40.0%)	15(37.0%)	
Parity	Para 1-3	32(80.0%)	33(82.5%)	0.96
	Para >3	8(20.0%)	8(20.0%)	
Socioeconomic status	Upper class	4(10%)	3(7.5%)	0.31
	Middle class	24(60%)	20(50%)	
	Poor class	12(30%)	17(42.5%)	
Literacy	Educated	11(27.5%)	9(22.5%)	0.56
	Uneducated	29(72.5%)	31(77.5%)	

Regarding the duration of the first stage of labor, the average duration in the phloroglucinol group was 210.20 ± 56.96 minutes, whereas in the placebo group, it was 323.30 ± 55.07 minutes (p<0.0001). Table II

Table II: Duration of first stage of labour comparison in both groups. (n=80)

Group	Mean ± SD	P value
Group A (Phloroglucinol)	210.20±56.96 minutes	0.00001
Group B (Placebo)	323.30±55.07 minutes	

Discussion

Managing prolonged labour is a major concern because it's linked with higher rates of maternal and neonatal mortality and morbidity. Typically, efforts to reduce the duration of labour involve actions such as membrane rupture, administering medications to enhance contractions, and offering continuous support.[10,13] This randomized control trial has been done to assess the effect of phloroglucinol on shortening the active first stage of labour duration in our local population by comparing its efficacy to a control group during first-stage of labour, containing

the average age was 27.27±6.26 years in group A, while in group B, it was 29.37±5.24 years. A significant proportion of patients, 49 (61.25%), were between 18 and 30 years old. The majority of patients, 47 (58.75%), had a gestational age between 38 to 40 weeks. In the comparison of this study Tchente CN et al[6] reported that the average age of participants was 26.6±6.1 years in the treatment group, while in the control group, the mean age was 25.844 years with a standard deviation of 5.4 years with no statistically significant difference (p= 0.620). Additionally, the mean gestational age was 38.6 weeks of the treatment group and 38.7 weeks in the placebo group (p- 0.779). Consistently Tahira T et al[14] the average age of patients in group A and B was 27.90 and 27.25 years, respectively. The average gestational age of group A and B was 38.05 and 38.13 weeks, respectively. According another study Nazir R et al[15] also reported that the average age of participants in the treatment group was 25.43 years with a standard deviation of 3.00 years and in control group was 25.29 years with a standard deviation of 3.66 years. Additionally, the mean gestational age in treatment group was 38.45 weeks with a standard deviation of 0.70 weeks and 38.74 weeks with a standard deviation of 1.36 weeks was in placebo group. Nevertheless, the mean age seen across multiple investigations, including this one, remained less than 30 years. This rise raises is concerned about this age group, which could be related to a number of factors, including socioeconomic position, having access to medical care, and dietary habits. Further investigation is needed to better understand the underlying causes for the frequency of younger participants.

In the present study, the average duration of the first stage of labor was 210.20 ± 56.96 minutes in the phloroglucinol group and 323.30 ± 55.07 minutes in the placebo group (p<0.00001). Consistently Tabassum S et al[16] found that phloroglucinol reduced the average duration of the first stage of labor to 227.74 ± 13.60 minutes, compared to 344.26 ± 9.49 minutes in the placebo group. In a comparable manner Rong-kai et al[17] observed a substantially shorter active phase in the Spasfon group than the diazepam group. Tahir S et al[18] also reported a significant reduction in the mean duration of the first stage of labour in their study. In Batool S et al[19] Phloroglucinol was compared with Drotaverine, revealing a notable decrease in the duration of the first stage of labour in the Phloroglucinol group. Shortening the active phase of labour not only alleviates pain but also diminishes the risk of complications such as chorioamnionitis and neonatal sepsis. Importantly, vaginal delivery rates remained high, with no significant differences in neonatal outcomes between the groups. Parveen et al[20] discovered that augmenting standard treatment with phloroglucinol led to a reduction in labour duration, without any maternal or neonatal adverse effects. Additionally, the rates of cesarean section and assisted vaginal deliveries were lower, and less oxytocin was required. According to a systematic review and meta-analysis also observed that the use of phloroglucinol has been demonstrated to be efficacious

in expediting labour, thereby decreasing the likelihood of complications for both mothers and newborns.[21]

Consistently Siddiquie M et al[22] reported that the average length of the first stage of labour was 230.20 ± 52.96 minutes in phloroglucinol group, compared to 345.30 ± 50.57 minutes in placebo group, with a significant difference observed (p- 0.0001). Furthermore, Siddiquie M et al[22] and Tchente CN et al[6] also reported that the intervention of the phloroglucinol effectively shortens the duration of the active first stage of labour. Based on above conclusive findings, it is advisable to promote the use of phloroglucinol as a standard practice in labour management, potentially enhancing both maternal and neonatal outcomes. Additionally, conducting large-scale studies is recommended to further observe its safety profile.

Conclusion

Phloroglucinol observed to be the effective in decreasing the duration of the active first stage of labour. It is suggested to incorporate Phloroglucinol into routine practice guidelines for labour acceleration in select cases, which could potentially lead to a reduction in perinatal mortality and morbidity for both the mother and fetus. Further research and clinical trials are warranted to validate these outcomes and explore its broader implications in obstetric care.

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