



## Effect of Intravenous Phloroglucinol Injections upon duration of Active First Stage of Labor

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### Significance:

Prolonged labor is held responsible for poor maternal and neonatal outcome. Due to lack of remedies and defined criterion for active interventions, prolonged labor is manipulated for justification of cesarean sections leading to their higher rates than ever before. Hence the main goal of present study is to explore ways and means to ease out the natural birth process.

### ABSTRACT

**Objective:** In our part of the world, poverty and illiteracy has adversely affected our core objective of pregnancy i.e. healthy mother and healthy child. Exploring the role of a routinely used drug in reducing the duration of labor could be a breakthrough. Present study was planned accordingly to evaluate the effect of phloroglucinol (PHL).

**Materials and Methods:** It was a Randomized controlled trial conducted at Department of Obstetrics & Gynecology, Combined Military Hospital, Bahawalpur from January to June 2019. This study included 60 cases of age 18 to 40 years, having singleton pregnancy and in active first stage of uncomplicated labor. Patients with history of multiple pregnancies, obstetrical and surgical complications and cardiorespiratory diseases were excluded. The cases were placed randomly into Group A & Group B and given intravenous PHL and a placebo respectively. After this, duration of the first stage of labor was recorded in minutes from when there was 3-4 cm cervical dilatation with regular uterine contractions to complete cervical dilation i.e. 10 cm and descent of the presenting fetal part.

**Results:** Mean duration of active first stage of labor in experimental group A ( $230.20 \pm 52.96$  minutes) was significantly higher than that of control group B ( $345.30 \pm 50.57$  minutes).

**Conclusion:** This study concluded that intravenous PHL has efficiently reduced the duration of active first stage of labor in these randomly selected nulliparous and multiparous women. PHL is a useful drug serving the purpose of a spasmolytic, analgesic, and labor augmentation at the same time.

### Introduction

Labor is the process of expulsion of products of conception (POC) that comprises of three successive stages viz cervical dilatation, fetal expulsion, and placental expulsion. (1) Regular and powerful uterine contractions initiate first stage of labor which includes a latent phase (insubstantial cervical

effacement and cervical dilatation upto 5cm) followed by an active phase (substantial cervical effacement and complete cervical dilatation i.e. 10cm). The latent phase is prolonged if the duration exceeds 20 hours and 14 hours for primiparous and multiparous respectively. The active phase is considered prolonged if it exceeds 4 hours after adequate uterine contractions and 6 hours after inadequate uterine contractions. (2) Failure to progress spontaneously and deliver the POC is known as prolonged labor or dystocia but its more suitable to relate it with outcome or goals of pregnancy rather than simply the time duration. (3) One in every five of the women has to suffer from dystocia while almost 2/3<sup>rd</sup> of them are nulliparous. Other contributory factors include premature rupture of membranes, hypertension, hydramnios, over age, high BMI, epidural anesthesia and early hospitalization. (4)

White et al., interviewed the practitioners across Australia regarding "safe prevention of primary cesarean section" and could not find a consensus about when to augment labor medically or terminate labor through a cesarean section. They concluded with recommendations for further steps to remove barriers like basic policies, inadequate resources, women expectations about care and medicolegal issues. (5) According to statistics provided by World Health Organization (WHO) maternal mortality rate (MMR) and neonatal mortality rate (NMR) in Pakistan are 170/100,000 and 36/1000 live-births respectively. (6) This demographic data is very much alarming and UNICEF reported poverty, education and early age marriages as the main contributory factors, all of which lead to poor management of labor. In the country profile of Pakistan, UNICEF documented that sixty percent of NMR is the result of prematurity, birth trauma and birth asphyxia which are directly related to the delayed / obstructed labor. (7)

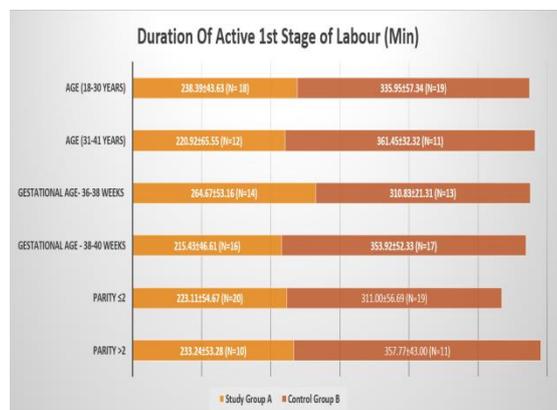


Fig 1: Duration of Active first Stage of Labor among various subgroups (Mean ± Standard Deviation)

The efficacy of conventionally used oxytocin for augmenting normal labor is now questionable as it hasn't affected the worldwide reducing incidence of spontaneous deliveries and the researchers are keen to explore other drugs. (8) Phloroglucinol, labeled as 1,3,5-trihydroxybenzol (IUPAC) is a routinely prescribed spasmolytic agent. Inhibiting calcium influx into the smooth muscle cells has been linked to its probable mechanism of action however anti-cancer and anti-inflammatory role is being established recently as it has been recognized as modulator of prostaglandin release and oxidative stress. The current study is designed to determine its role in facilitating the process of labor through its smooth muscle relaxing property. (9, 10)

### Materials and Methods

Eighteen to forty years old, sixty women with singleton pregnancy at gestational age 36-40 weeks were opted for the study. Women with multiple pregnancies, parity score  $>4$ , history of obstetrical and surgical complications and history of cardiorespiratory diseases were exempted from the study. The ethical guidelines i.e. approval from institutional research committee and detailed consent from the participants were strictly followed. The participants were randomly and equally distributed into study group A and control group B who were injected intravenous PHL 40mg (4ml) and intravenous placebo 4ml respectively at 0 hours. (11) Dose was repeated after 30 minutes. It was a double-blind trial as neither patient nor observer knew the content of the injection. The starting time of active first stage of labor was noted after regular uterine contractions and cervical dilatation of 3-4 cm. The duration was recorded over the monitoring chart until complete cervical dilation i.e. 10 cm or descent of the presenting fetal part, whatsoever comes first. All the data was entered and analyzed by using SPSS version 20.0. Mean and standard deviation was calculated for age, gestational age and duration of first stage of labor. Comparison between the groups with respect to the mean duration of first stage of labor was analyzed by student 't' test. P value  $\leq 0.05$  was considered as statistically significant.

### Results

Mean duration of active first phase of labor in the study group A was  $230.2 \pm 52.96$  minutes and in control group B it was  $345.3 \pm 50.57$  min  $345.3 \pm 50.57$  minutes. The difference was statistically significant (p value  $\leq 0.05$ ). Study participants were divided into two groups those were 18-30 and 31-40 years old and more participants from 18-30 years of age group.

### Discussion

The results of present study have shown that PHL treatment significantly reduced the duration of active first stage of labor among the younger age group (18-30 years) and the elder age group (31-41years).

Similar findings were reported by Tahir et al., who investigated the effectiveness of PHL in preventing the cesarean section along with the parameters of fetal wellbeing (APGAR Score) and maternal wellbeing (Postpartum Bleeding) and declared the drug safe and appropriate for accelerating the normal labor process. (11) Naqvi and Haroon compared the role of PHL and drotaverine upon delayed normal labor and documented that both the drugs were beneficial while the effect of former was more significant. The researchers recommended the use of these drugs because of the analgesic effect and no fetomaternal adverse effect. (12)

The results of our study illustrate that PHL has reduced duration of active first phase of labor in pregnant women with gestational age ranging from thirty-six to forty weeks and the reduction is statistically significant. Tahira et al., also devised the same subgroups (based upon gestational age) and injected 40mg of PHL hourly after cervical dilatation of 4cm. The outcome was significant reduction of labor duration among the study group. (13) Our statistical data signifies the role of intravenously injected PHL in reducing the duration of labor among nulliparous women as well as the multi parous women. Janjua et al., investigated the role of PHL among the primigravida and compared it with drotaverine. first intravenous dose was given at cervical dilatation 4cm and second dose at cervical dilatation 8cm. Their results also concluded that women receiving PHL have shorter duration of normal delivery. (14)

Ara et al., conducted similar randomized double blinded controlled trial over hundred term primigravida cases and recorded the duration of first and second stage of labor. The study cases were injected with PHL and the control cases were given placebo. (15) The outcome was shorter duration of labor, lesser number of instrumental and cesarean deliveries among the study group. Parveen et al., assessed the role of PHL injection along with the conventional oxytocin infusion in women with delayed labor augmented by rupture of membranes and declared this regime safe and effective. (16)

Similar findings were reported by Tchente et al., who recently conducted a single blinded randomized control trial regarding the efficacy of PHL. PHL was found effective in achieving the primary goal i.e. escalation of delayed labor as well as the secondary goals comprising of fetal and maternal well-being. Also, there was no case of postpartum hemorrhage indirectly supporting the evidence that PHL doesn't inhibit uterine contractility. (17)

Contradictory to our comments Yuan et al., stated that PHL causes relaxation of uterine muscles and proposed its preventive role during threatened abortion. (18) Likewise, Xu et al., recommended therapeutic role of PHL for maintaining In vitro fertilization (IVF) induced pregnancy that is otherwise adversely affected by endometrial peristalsis. (19) Blanchard et al., reviewed the published data and

found insufficient for declaring PHL as an analgesic and antispasmodic agent in the field of gynecology and obstetrics.<sup>20</sup> These studies differ from the current study w.r.t stages of pregnancy; each of which has a distinct hormonal make-up and behaves differently.

### Conclusion

Our statistical data concludes that the duration of active first phase of labor is significantly reduced by PHL as compared to the control group irrespective of the age, gestational week, and parity. It could be beneficial in facilitating delayed labor, in avoiding unnecessary cesarean sections and most of all reducing the MMR and NMR with minimal resources.

**Conflict of interest:** Authors do not have any conflict of interest to declare.

**Disclosure:** None

**Human/Animal Rights:** No human or animal rights are violated during this study.

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