



Original Article



Effect of Intraumbilical (IU) Vein Oxytocin Injection on Duration of Third Stage of Labour: A Comparative Study

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ABSTRACT

Effective management for reducing the duration of 3rd stage of labour can prevent serious complications such as post-partum hemorrhage. **Objective:** To evaluate the effect of intraumbilical venous oxytocin injection compared to placebo on reducing the duration of the third stage of labour in normal vaginal deliveries. **Methods:** In this quasi-experimental study, 100 pregnant female fulfilling the selection criteria were included from the Obstetrics and Gynecology Department of Sharif Medical and Dental City Hospital, Lahore. Informed consent was obtained from participants. Participants were divided into 2 groups. In Group A, the female was given intraumbilical oxytocin and in Group B, a placebo (normal saline) was used. All female was followed up till delivery of the fetus and time was noted from delivery of the fetus to the placenta. Data were analyzed using SPSS version 26.0. **Results:** In Group in. Intraumbilical oxytocin, duration of 3rd stage of labour was less than 3.68 ± 1.49 minutes as compared to placebo group 7.02 ± 2.85 minutes ($p < 0.01$). Data stratification concerning age, gestational age and parity also showed a significant difference of 3rd stage duration among groups with $p < 0.01$. **Conclusions:** It was concluded that intraumbilical oxytocin was found to be useful in decreasing the third stage of labour duration. Its use may help prevent cases of prolonged third stage, which could otherwise lead to adverse outcomes. These findings support the potential clinical benefits of IU oxytocin in the third stage of labour.

INTRODUCTION

The third stage of labour, from fetus delivery to the expulsion of the placenta, lasts between 5 to 15 minutes [1]. Incomplete or faulty separation of the placenta can lead to post-partum hemorrhage (PPH) [2, 3]. Royal College of Obstetricians and Gynecologists (RCOG) classifies PPH into minor and major categories based on the extent of blood loss [4, 5]. PPH is the leading cause of maternal death. PPH occurs in about 2-5% of all deliveries, with most fatalities occurring within the first four hours after delivery, indicating its close association with the third stage of

labour [6]. The prolonged third stage is recognized as a key factor contributing to excessive bleeding, which is why various time intervals are used to diagnose abnormal placental conditions and assess the risk of PPH [7]. The standard treatment for retained placenta is manual removal under general anesthesia. If not coped correctly, the death rate can be as high as 10% [8]. Numerous studies have highlighted the beneficial effects of intraumbilical oxytocin in declining the 3rd stage of labour interval [9]. Oxytocin is a peptide hormone, readily available in



synthetic form and is extensively used in labour and delivery [10]. Administering oxytocin into the umbilical vein delivers the drug directly to the placental bed, stimulating uterine contractions and aiding placental separation [11]. While managing 3rd stage of labour, preventing prolonged placental separation is crucial to avoid postpartum hemorrhage. Existing literature suggests that intraumbilical oxytocin administration may reduce the duration of the third stage of labour, thereby lowering the risk of hazardous outcomes. However, there is limited locally published research on the routine use of intraumbilical (IU) vein oxytocin for this purpose, particularly in our population. Additionally, some ambiguity exists in current studies regarding the consistent efficacy of oxytocin for early placental removal, contributing to a lack of consensus [12].

This study aims to evaluate the effect of IU venous oxytocin injection compared to placebo on reducing the duration of the third stage of labour in normal vaginal deliveries.

METHODS

This quasi-experimental study was done at the Department of Obstetrics and Gynecology of Sharif Medical and Dental City Hospital, Lahore, over 6 months from March 2020 to September 2020 after obtaining ethical approval from IRB (SMDC/Com.Med/860). The sample size of 100 cases was calculated taking a 95% confidence level, 80% power of the test and taking the mean duration of the third stage i.e. 4.24 ± 3.27 min with IU oxytocin and 10.66 ± 7.41 min with placebo [13]. Non-probability, consecutive sampling technique was used. Pre-designed Performa was used to collect information. 100 Female of age 18-40 years with parity of <5 and at ≥ 38 weeks of gestation (on last menstrual period (LMP)) presenting in labour undergoing normal vaginal delivery (regular uterine contractions +cervical dilatation of >7 cm) were included. Female with multiple pregnancies, having systemic problems (Pregnancy hypertension (PIH), gestational diabetes, renal problem, liver problem, anemia ($Hb < 10$ g/dl), Chronic Obstructive Pulmonary Disease (COPD) or cardiac problem), female with fetal anomaly/IUGR, female with abnormal placental position or abruption and those with premature rupture of membranes were excluded from the study. Informed consent was obtained from all female. Demographic details were noted. Female was divided into two equal groups; Group A, intraumbilical (IU) oxytocin and Group B, placebo (normal saline). All female was followed up till the delivery of the fetus. The third stage of labour was managed in both groups with 20 IU oxytocin infusion in 1liter Ringer's lactate at 100 mL/min, instantaneously after fetus delivery. In group A, after clamping and cutting of umbilical cord 10 IU oxytocin was injected into the umbilical vein at the most proximal site to the placenta. In Group B,

1mL of normal saline was injected at the same site. The duration required for delivery of the placenta after the delivery of the fetus in minutes was noted. Data were analyzed using SPSS version 26.0. Quantifiable variables were presented as mean \pm S.D. Qualitative variables such as frequency and %. Independent student t-test was applied to compare the third stage of labour duration among groups, p-value < 0.05 was taken as significant.

RESULTS

The mean age of patients in the IU oxytocin group and placebo group noted was 29.78 ± 5.40 years and 29.90 ± 5.69 years, respectively. In terms of parity, 52% of the IU oxytocin group had fewer than three children, compared to 56% in the placebo group. Gestational age in both groups was also comparable, 39.34 ± 1.26 weeks in the IU oxytocin group and 39.60 ± 1.18 weeks in the placebo group. The sociodemographic characteristics of patients are shown in table 1.

Table 1: Sociodemographic Characteristics of the Study Population

Age in years (Mean \pm SD)		
Injection IU Oxytocin		29.78 \pm 5.40
Placebo		29.90 \pm 5.69
Gestational Age in Weeks		
Injection IU Oxytocin		39.34 \pm 1.26
Placebo		39.60 \pm 1.18
Parity n (%)		
Injection IU Oxytocin	<3	26 (52%)
	3-4	24 (48%)
Placebo	<3	28 (56%)
	3-4	22 (44%)

Among female who were given injections of IU oxytocin, the mean duration of 3rd stage of labour was found to be less than 3.68 ± 1.49 minutes than that of the placebo group 7.02 ± 2.85 minutes, and this difference was statistically significant as shown in table 2.

Table 2: Comparison of Duration of 3rd (in mins.) Stage of Labour among Groups

Study Groups	Mean	S.D	p-value
Injection IU Oxytocin	3.68	1.49	<0.001
Placebo	7.02	2.85	

When stratified for age, parity and gestational age, the mean duration of labour was found to be significantly lower in injection. IU Oxytocin group as compared to placebo, as shown in Table 3.

Table 3: Comparison of Duration of Labour for Both Groups with Stratification

Variables	Study Groups	Mean \pm SD	p-value
Age (Years)			
18-29 Years	Injection IU Oxytocin	3.73 \pm 1.40	<0.0001
	Placebo	7.75 \pm 3.31	

30-40 Years	Injection IU Oxytocin	3.62 ± 1.61	<0.0001
	Placebo	6.35 ± 2.21	
Parity			
<3	Injection IU Oxytocin	3.89 ± 1.47	<0.0001
	Placebo	7.50 ± 2.95	
3-4	Injection IU Oxytocin	3.43 ± 1.50	<0.0001
	Placebo	6.58 ± 2.74	
Gestational Age (Weeks)			
38-40 Weeks	Injection IU Oxytocin	3.66 ± 1.05	<0.0001
	Placebo	6.27 ± 2.34	
41-42 Weeks	Injection IU Oxytocin	3.72 ± 2.57	<0.0001
	Placebo	8.92 ± 3.22	

DISCUSSION

PPH and uterine atony can be avoided by actively managing the third stage of labour. The most important measure to avoid PPH is probably giving oxytocin right after labour. Oxytocin-treated women deliver the placenta faster and lose less blood, which lowers the risk of PPH and eliminates the need for manual placenta removal. Oxytocin delivered via the IU vein reaches the placental bed, inducing contractions and accelerating the placental parting process [14]. Current study findings noted that, in inj. IU oxytocin group, mean 3rd stage of labour interval was less as compared to placebo group, $p < 0.01$. Many previous trials have supported current study findings. One trial compared IU and intramuscular (IM) oxytocin and found that the duration of the third stage of labour was significantly shorter in the IU group as compared to the IM group ($p < 0.001$) [15]. Likewise, to current research one study has compared IU oxytocin with a placebo and its findings have supported our results, found that the third stage of labour was suggestively shorter in IU oxytocin compared to controls (4.33 ± 1.52 minutes vs. 9.40 ± 2.77 minutes; p -value < 0.001) [16, 17]. In another trial, the average time taken by 3rd stage of labour was 159 seconds in the placebo vs 143 seconds in the oxytocin group, but this difference was not significant and no hostile effects from the procedure were reported [18]. In contrast to the current study, two trials have reported insignificant variance in the third stage of labour duration between groups treated with IU oxytocin, IM oxytocin and misoprostol, p -value = 0.08 and established that neither IU/IM oxytocin nor sublingual misoprostol led to a noteworthy decline in the extent of the third stage of labour [19, 20]. The current study has certain restrictions, small study population and limited selection criteria would limit the generalizability of our results. Furthermore, the IU oxytocin was compared with a placebo, and drug-related side effects were not studied. Further research is needed in future to cover these aspects.

CONCLUSIONS

It was concluded that IU oxytocin is useful in decreasing the duration of the third stage of labour. Its use may help prevent cases of prolonged third stage, which could otherwise lead to adverse outcomes. These findings

support the potential clinical benefits of IU oxytocin in managing the third stage of labour.

Authors Contribution

Conceptualization: AS

Methodology: AS, SH, SG, SS, SM, AA, SK², HMZ,

Formal analysis: SK¹

Writing review and editing: SG, SS, HMZ, Sk²

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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