

DELAYED VERSUS IMMEDIATE OXYTOCIN INFUSION AFTER AMNIOTOMY FOR INDUCTION OF LABOUR. A RANDOMIZED CONTROL TRIAL

Dr. Ambreen Ayesha^{*1}, Dr. Meher-Un-Nisa²

^{*1}(PGR Obstetrics and Gynecology), Lady Aitchison Hospital Lahore.

²(MBBS, MHPE, ICMT, FCPS), Professor of Obstetrics and Gynecology, King Edward Medical University & Affiliated Hospital, Lahore. (Lady Aitchison Hospital Lahore).

^{*1}ambreenayesha786@gmail.com

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Corresponding Author: *

Dr. Ambreen Ayesha

Abstract

Objective: To compare the outcomes of early oxytocin infusion versus delayed oxytocin infusion after amniotomy for induction of labor.

Methods: In this randomized controlled trial, we included 72 women who were planned for induction of labour. The patients were recruited from the labor pain unit of Lady Aitchison Hospital, Lahore, from November 2024 to March 2025. In group A, patients received oxytocin within 30 minutes following amniotomy if labor had not commenced. Conversely, group B participants were observed for 2 hours post-amniotomy to determine if labor would begin naturally. If labor did not initiate after this period, oxytocin was administered.

Results: The included patients had an average age of 32.05 (± 4.6) years. Our results showed a statistically significant difference in the time it took for labor to progress from amniotomy to delivery. Group A had an average time of 5.6 $\pm$ 1.7 minutes, while Group B took an average of 6.9 $\pm$ 1.8 minutes (p -value = 0.002). When looking at the childbirth perception score, Group A reported an average score of 7.3 $\pm$ 1.2, and Group B had an average score of 7.1 $\pm$ 0.7 (p -value 0.39).

Conclusion: According to our study results, women who received early oxytocin infusion after amniotomy had a shorter amniotomy to delivery interval.

INTRODUCTION

Labour induction refers to the process of artificially initiating contractions in pregnant women, typically before natural labor begins and after the fetus has reached a point of viability. This method often leads to a vaginal delivery, which is generally considered safer for both the mother and the newborn.^{1, 2} The practice is employed when the risks associated with prolonging the pregnancy outweigh the benefits.³ Recent statistics indicate that approximately 40% of first-time mothers (primigravida) and about 30% of those who have previously given birth (multigravida) undergo labour induction. Notably, a significant rise

in the rate of labour inductions was recorded in the United States in 2012, reaching 23.3%, a substantial increase from the 9.5% reported in 1990.^{4, 5}

The choice to induce labor is influenced primarily by two critical considerations: the potential risks associated with induction versus the dangers of prolonging the pregnancy. In cases where the cervix is deemed favorable, the typical approach involves performing an amniotomy followed by an immediate infusion of oxytocin. However, the practice of administering oxytocin post-amniotomy remains under scrutiny due to the possible side effects

associated with the routine use of synthetic oxytocin during labor, which include uterine hyperstimulation and a higher likelihood of cesarean delivery.⁶

A variety of research has demonstrated that if oxytocin is given later after amniotomy, it may not be required for 19% to 68% of women. Additionally, no significant clinical effects have been reported regarding the delay in oxytocin administration, particularly in relation to patient experiences.⁷ While some other studies have indicated that administering oxytocin within two hours of amniotomy is associated with more favorable pregnancy outcomes.^{8,9}

Our proposed study aims to find the best time to start oxytocin treatment for mothers and babies to achieve the best results. By running a randomized controlled trial that compares different approaches, we can collect data on the safety and effectiveness of delaying labor induction versus starting it right away. This can help obstetricians make informed decisions about when to induce labor, leading to better outcomes for both mothers and babies.

METHODS:

In this randomized controlled trial, we included 72 women who were planned for induction of labour for one of the following indications: prolonged pregnancy (> 41 weeks), mild hypertensive disorder, diabetes, expected macrosomia, or maternal request. Other inclusion criteria were age ≥ 18 years, gestation period of 37 weeks, a Viable fetus in cephalic presentation, and intact membranes. While women with premature rupture of the membranes, previous cesarean section history or any uterine scar, multiple pregnancy and those having contraindications to oxytocin were excluded. The patients were recruited from the labor pain unit of Lady Aitchison Hospital, Lahore, from November 2024 to March 2025. Informed consent was obtained from each patient.

Demographic variables including maternal age, parity, and body mass index (BMI) were documented. Participants were randomly divided into two groups through a draw randomization method. I prepared folded envelopes labeled either

Group A or Group B. The attending nurse was instructed to select one folded envelope for each patient. Patients were then assigned to either Group A or Group B based on the chosen envelope.

In group A, patients received oxytocin within 30 minutes following amniotomy if labor had not commenced. Conversely, group B participants were observed for 2 hours post-amniotomy to determine if labor would begin naturally. If labor did not initiate after this period, oxytocin was administered. We analyzed the duration from amniotomy to delivery and recorded the APGAR scores at 5 minutes for both groups. Additionally, one week after delivery, patients were asked to complete the Childbirth Perception Scale to assess their personal experience of childbirth.

Data entry and analysis were conducted using SPSS version 25.0. The interval from amniotomy to delivery, along with scores from the childbirth perception scale, were compared between groups through an independent t-test. The APGAR score of less than 7 at 5 minutes was evaluated using a Chi-square test. A P-value of ≤ 0.05 was deemed statistically significant.

RESULTS:

The baseline characteristics of the study population include an average age of 32.05 (± 4.6) years. Participants had a mean body mass index (BMI) of 25.11 (± 4.56) Kg/M². The average parity of the subjects was recorded at 2.73 (± 0.70). Additionally, the average gestational age among the participants was 40.1 (± 1.22) weeks (Table 1).

Our results showed a statistically significant difference in the time it took for labor to progress from amniotomy to delivery. Group A had an average time of 5.6 $\pm$ 1.7 minutes, while Group B took an average of 6.9 $\pm$ 1.8 minutes (p-value = 0.002). Both groups had no cases of an APGAR score under 7 at 5 minutes, resulting in a 0% rate for both groups. When looking at the childbirth perception score, Group A reported an average score of 7.3 $\pm$ 1.2, and Group B had an average score of 7.1 $\pm$ 0.7. The p-value of 0.39 showed no significant difference between the groups in this area. (Table 2).

Table 1. Baseline Characteristics.

Age	32.05±4.6
BMI	25.11±4.56
Parity	2.73±0.70
Gestational Age	40.1±1.22

Table 2. Comparison of Study Outcomes.

	Group A; Immediate Oxytocin Infusion (N=36)	Group B; Delayed Oxytocin Infusion (N=36)	P-value
Amniotomy to delivery Interval	5.6±1.7	6.9±1.8	0.002
APGAR Score <7 at 5 mins	0 (0.0%)	0 (0.0%)	~~~~~
Childbirth Perception Score (CPS)	7.3±1.2	7.1±0.7	0.39

DISCUSSION:

The current study aimed to compare the effects of administering oxytocin early versus delaying its infusion following amniotomy. The primary outcomes assessed included the time from amniotomy to delivery, patient experience, and the APGAR score at 5 minutes. Results indicated that the interval between amniotomy and delivery was significantly shorter in the group receiving early oxytocin infusion. However, no significant differences were observed between the two groups in terms of APGAR scores or neonatal health assessed by the CPS score.

Our research corroborates the results obtained by Moldin et al., indicating that the duration between amniotomy and delivery is significantly prolonged when the administration of oxytocin is postponed

for 12 hours following amniotomy. Moldin et al. reported a median interval of 9 hours between amniotomy and delivery with a 12-hour delay in oxytocin administration.¹⁰

Titulaer et al. conducted a study on comparison of outcomes of immediate versus delayed oxytocin infusion after amniotomy for induction of labor. The authors reported significantly lower amniotomy to delivery interval in early oxytocin group; 6 (5-11) hours versus 15 (8-21) hours in delayed group. There was no significant difference in patient reported Childbirth Perception score (CPS) between the groups. CPS was 6.8±1.1 in early group versus 7.7±0.8 in delayed group. There was no incidence of five minutes APGAR score <7 in any group.¹¹ Another study by Upawi et al. reported significantly

shorter amniotomy to delivery interval in patients receiving early oxytocin infusion; 5.8 ± 1.7 hours in early versus 7.0 ± 1.9 hours in delayed group.¹²

Our research found no significant variance in the overall CPS scores between the groups that received early versus delayed interventions. Additionally, Tan and colleagues investigated the impact of postponing oxytocin administration for four hours following amniotomy in women who have previously given birth. Their study revealed a higher prevalence of epidural analgesia use in the group with delayed oxytocin but did not observe any differences in maternal satisfaction with the childbirth experience.¹³ Comparing perceptions or satisfaction levels related to childbirth across different countries can be challenging because of the distinct characteristics of the Pakistani healthcare system and the different attitudes of Dutch women towards childbirth.¹¹

The study is limited by small sample size. Studies with larger sample sizes are needed to determine either there is really a need for early oxytocin administration after amniotomy or not.

CONCLUSION:

to our study results, women who received early oxytocin infusion after amniotomy had a shorter amniotomy to delivery interval.

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