

Successful Induction of Labour at 40+ and 41+ Weeks in Primigravida Women

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ABSTRACT

Background: Induction initiates labour before it starts naturally, often used between 40–41 weeks in complicated pregnancies to reduce risks. **Objective:** The aim of the study to find the frequency of successful induction of labour at 40+ and 41+ weeks in primigravida and to compare the frequency of successful induction at these gestational ages. **Study Design:** descriptive cross-sectional study. **Settings:** Obstetrics & Gynecology Department of MTI-LRH, Peshawar Pakistan. **Duration:** July 2022 to January 2023. **Methods:** 120 primigravida women who were 40+ and 41+ weeks along in their gestation were included in the study. The data was analyzed using SPSS version 16. **Results:** In this study, the primigravida women who were at 40+ and 41+ weeks were measured for the results of induction of labour. 40 weeks (SD ± 1.0) was the average gestational age, while the average mother age was 33.5 years (SD ± 4.5). 18.33 percent had caesarean section births, while vaginal birth accounted for 81.66 percent; of the deliveries within 48 hours of attempted induction, the rate was a 66.66 percent; the outcomes among those induced were better at 40+ compared to 41+. **Conclusion:** Inducing labour at 40+ and 41+ weeks is a safe and effective way to reduce caesarean sections and improve newborn outcomes. The prevalence of vaginal deliveries was higher at 40+ weeks than at 41+ weeks, highlighting the need of good patient selection and close monitoring during labour induction.

Keywords: Vaginal delivery, Neonatal outcomes, Caesarean section, Prolonged pregnancy.

INTRODUCTION

One common method of starting labour is induction of labour (IOL), which involves stimulating the uterus before labour spontaneously starts. In addition to expediting delivery, this is the artificial start of labour before the body starts it on its own.¹ It is frequently done to prevent the problems that come with an extended pregnancy.² An increasing tendency in induction is observed in the majority of nations worldwide. The percentage in wealthy nations, like the USA, varied between 9.5% and 23.2%.³ While the rate of induction of labour (IOL) is between 4 and 12% in developing countries, it is significantly higher in wealthy countries (26 per cent in Australia and 23.3% in the UK), and was 24.9% in Queensland in 2014.⁴ Foetal growth limitation,

post-term pregnancy, hypertension, and in some situations, maternal request are the most frequent reasons for induction.⁵⁻⁷

Around the world, the success rate of inducing labour differs by continent. According to a secondary World Health Organization (WHO) analysis of the results of induction of labour in sixteen Asian and African nations, the average success rate for IOL in Asian nations was 81.6%, with a range of 67.9% in China to 90.10 percent in Cambodia, and 83.4% in African nations, with a range of 57.3% in Uganda to the highest range of 95% in Angola.⁸⁻¹⁰ A local study conducted at PAEC Hospital, Islamabad, reported that induction at 40–41 weeks resulted in a lower caesarean section rate (64.52%). This indicates that the timing of induction plays a crucial role in pregnancy

outcomes.¹¹ Despite these findings, there are no universal national or local protocols for induction after term. Whether elective induction or a conservative approach is better remains a topic of ongoing research.¹²

This study aimed to determine the frequency of successful induction of labour at 40+ and 41+ weeks in primigravida and to compare the frequency of successful induction at these gestational ages. The study intends to evaluate the percentage of inductions that are effective within 48 hours and examine how the induction results change between these two gestational periods. The study compares the number of effective inductions at 40+ and 41+ weeks to shed light on when induction should be performed to enhance outcomes for both the mother and the fetus.

METHODS

This descriptive cross-sectional study was carried out from July 2022 to January 2023, in the Gynae B Unit of Lady Reading Hospital (LRH), Peshawar. The OpenEpi sample size calculator (version 3.01) was used to determine the sample size. A total of 120 patients were included in the sample, which had an 8.4% prevalence⁸, a 5% margin of error, and a 95% confidence interval. To reduce selection bias and guarantee sufficient representation of primigravida women receiving induction at 40+ and 41+ weeks, consecutive sampling was employed for patient selection. Participants in this study had to be between the ages of 20 and 35, primigravida, singleton pregnant, and have a gestational age of 40 or 41 weeks. Pregnant women with preeclampsia, diabetes, hypertension, or premature rupture of membranes, multigravida, primigravida with malpresentation, and primigravida with multiple pregnancies were excluded.

Approval of the study was obtained from the hospital's ethical committee (Ref. No. 19/LRH/MTI dated 27th June 2022). The aim of the study was explained to all patients who met the inclusion criteria. A detailed history was taken, and the gestational age was calculated based on the last menstrual period and early ultrasound findings. A complete physical examination, including abdominal and vaginal examination for Bishop scoring, was performed before induction. Patients were induced using a mechanical Foley's catheter for the first 12 hours, followed by the application of PGE2 gel. If needed, a second application of PGE2 gel was given after 6 hours. Patients were observed for another 24 hours without intervention. Successful induction was defined as delivery occurring within 48 hours, while failed induction was when the patient did not deliver within this period. Care was taken in patient selection to avoid selection bias, and exclusion criteria were strictly followed to control confounders and maintain study validity.

Data was analyzed using SPSS version 16. Quantitative variables such as age and gestational age were presented as mean and standard deviation. Categorical variables, including caesarean section rate and vaginal delivery within 48 hours, were described as frequencies and percentages. The chi-square test was used to compare the success rate of induction between 40+ and 41+ weeks, considering a P-value ≤ 0.05 as statistically significant. Effect modifiers such as age and gender were controlled through stratification. The final results were presented in tables and charts for better visualization.

RESULTS

The results of this study shed significant light on the consequences of inducing labour in primigravida women at 40+ and 41+ weeks. The research participants' mean gestational age was 40 weeks with a standard deviation of 1.0, and their mean age was 33.5 years with a standard deviation of 4.5. With 60 patients (50%) in each age group, the age-wise distribution revealed an equal number of participants in the 18–25 and 26–35 age groups shown in Table 1.

Table 1: Age groups frequency distribution of patients

Age Group	Frequencies
18-25 Years	60(50%)
26-35 Years	60(50%)
Total	120

The mode of delivery results revealed that out of the total 120 patients, 22 (18.33%) underwent caesarean section, while 98 (81.66%) had a successful vaginal delivery. At 40+ weeks, 10 patients (8.3%) had a caesarean section, whereas at 41+ weeks, 12 patients (10%) required a caesarean section. Vaginal delivery was achieved in 50 patients (41.66%) at 40+ weeks and 48 patients (40%) at 41+ weeks. These findings indicate that the rate of vaginal delivery was slightly higher at 40+ weeks compared to 41+ weeks, and the caesarean section rate was slightly increased at 41+ weeks as shown in Table 2.

Table 2: C Section Rate and Vaginal Delivery Rate

Mode of Delivery	At 40+ n (%)	At 41+ n (%)	Total n (%)
C Section Rate	10 (8.3) %	12 (10%)	22 (18.33%)
Vaginal Delivery Rate	50 (41.66%)	48 (40%)	98 (81.66%)
Total	60 (50%)	60 (50%)	120 (100%)

Regarding the success of induction within 48 hours, a total of 80 patients (66.66%) had successful induction, whereas 40 patients (33.33%) did not deliver within this time frame, as shown in Table 3. When stratified by age, the success rate of induction at 40 weeks was 25 (20.83%) in the 18–25 years age group and 30 (25%) in the 26–35

years age group. At 41 weeks, 15 (12.5%) patients in the younger age group and 10 (8.33%) in the older age group had successful induction. The statistical analysis showed that the difference in successful induction between age groups was not significant, with P-values of 0.354 and 0.052, respectively shown in Table 4.

Table 3: Successful induction within 48 hours

Successful Induction	Frequencies	Percentages
Yes	80	66.66%
No	40	33.33%
Total	120	100%

The findings indicate that induction at 40 weeks is linked to a somewhat greater success rate than induction at 41 weeks, as seen by the higher proportion of vaginal births and lower incidence of caesarean sections. Furthermore, it seems that age has little bearing on whether induction within 48 hours is successful. These results are consistent with other studies that found that induction at 40 weeks had better results than waiting until 41 weeks. To enhance mother and foetal outcomes and lower the risk of caesarean section, the study emphasises the significance of early induction.

Table 4: Stratification of successful induction for age

Age Groups	Time of Induction	Successful Induction		P Value
		Yes	No	
18-25 Years	40 weeks	25 (20.83%)	10 (8.3%)	0.354
	41 weeks	15 (12.5%)	10 (8.3%)	
26-35 Years	40 weeks	30 (25%)	10 (8.3%)	0.052
	41 weeks	10 (8.33%)	10 (8.3%)	

DISCUSSION

This study evaluated the effectiveness and results of induction at 40+ and 41+. Participants were 33.5±4.5 years old on average, and the mean gestational age was 40 weeks. The vaginal delivery rates were 40% at 41 weeks and 41.66% at 40 weeks, while the induction success rate at 48 hours was 66.66%.

The outcomes of giving birth at 41 weeks after receiving prenatal care up to 42 weeks were assessed by Alkmark *et al.* (2019). According to the findings of this study, the induction group had no fatalities, indicating that induction at 41 weeks decreased perinatal mortality, whereas the expectant management group suffered six deaths, including five stillbirths and one neonatal death. Induction at 40 and 41 weeks appears to be a modest contributing factor to the caesarean delivery, given that 81.66% of vaginal deliveries were successful in this

research.¹³ In their study on misoprostol-assisted labour induction, Corrêa *et al.* (2022) found that the caesarean rate was 22.79%, while the hospital's total caesarean rate was higher. Given that the operation led to an 18.33% caesarean rate, labour induction is beneficial in lowering the number of surgical procedures.¹⁴ According to their findings, Andleeb *et al.* (2021) investigated how labour induction affected both the women and their newborns. Those who experienced induced labour had a 54% caesarean section rate, whereas those who experienced spontaneous labour had a 17.1% rate. According to the study, spontaneous labour increases the likelihood of vaginal delivery.¹⁵ According to the Rasheed *et al.* (2024) study, the failure rate for labour induction was 31.3% for non-obese women and 59.4% for obese women.¹⁶ According to research by Latif *et al.* (2023), 42% of obese women who were subjected to induction had a cesarean delivery, whereas 58% gave birth naturally. The majority of participants in this study gave birth to their kids vaginally, which is consistent with the research's findings. Given that this study reveals a Caesarean rate of just 18.33%, labour outcomes seem to be impacted by gestational age circumstances, foetal posture, and various forms of induction.¹⁷

The study conducted by Levine *et al.* in 2021 showed that standardized labor induction preserved mother health while lowering neonatal NICU admission rates. 66.66 percent of the participants successfully underwent inductions throughout the first 48 hours. Early pregnancy inductions have been shown to offer significant benefits for both expectant moms and their unborn offspring.¹⁸

According to a study by Lueth *et al.* (2020), 76% of induced patients in Ethiopian hospitals had good results, whereas 24% of patients required cesarean section procedures. Given its 18.33% cesarean section rate, the researched prenatal induction intervention between weeks forty and forty-one may be beneficial if medical personnel give the right care.¹⁹

Another study, by Castro *et al.* (2019), assessed the role of routine ultrasonography at 35–37 weeks, during which non-cephalic presentation was detected in 5% of pregnancies, thus enabling timely intervention with either ECV or elective cesarean section.²⁰ In the current study, foetal position had no effect on the induction outcome; however, if malpresentation is detected by ultrasonography before to induction, the results will be further improved by lowering complications. Additionally, a research conducted by BMC Pregnancy and Childbirth that evaluated induction techniques revealed that the choice of induction drug had a significant impact on outcome rates. Foley's catheter and PGE2 gel were utilized in the current investigation, and the success rate of 66.66% was similar to data from other countries.¹⁹

At KRL Hospital in Islamabad, Khan *et al.* (2023) investigated the distinctions between labor after caesarean (TOLAC) and elective repeat caesarean births. According to the study, 64.52% of women needed a repeat caesarean procedure, whereas 35.48% of women delivered vaginally (VBAC) successfully. In addition, the VBAC group experienced NICU admissions at a significantly lower rate of 0% compared to the elective caesarean group's 20% rate. This study demonstrated high vaginal delivery rates (81.66%), thus further confirmed the benefits of trial-based birth care.¹¹ In their foetal outcome research, Iftikhar *et al.* (2022) found that younger pregnant women were more likely to experience poor Apgar scores (16.1%), foetal distress (11.4%), delivery asphyxia (32.9%), and birth weight shortages (17.8%). Research on labour induction success rates matched all age groups, although the results suggested that younger maternal groups may be at higher risk for foetal complications. According to this study, individualisation of labour induction treatment and foetal observation is necessary for the best outcomes for both mother and child.²¹

The fact that the study was only carried out in one place may make the findings less relevant. Although the sample size in this study was small, a bigger multicentre investigation might increase the trustworthiness of the findings. Although these aspects were not addressed in the study, the effects of labour induction may be impacted by maternal characteristics such as foetal weight, Bishop score, and BMI. In order to improve the generality of study findings, more colleges ought to expand the sample size in subsequent studies. The long-term medical effects of labour terminations among fetuses with varying gestational ages will be examined in future research. Incorporating maternal characteristics like as BMI, cervical health, and foetal orientation into the induction process may enhance medical outcomes for both moms and their growing newborns.

CONCLUSION

The research indicates that performing inductions at 40+ weeks before attempting 41+ weeks produces better vaginal birth results because it includes better patient selection procedures and continuous monitoring during labour. The evaluation of mid-pregnancy practices for maternal and foetal health improvement requires additional research with an extended period of post-birth monitoring for neonatal outcome evaluation. The study verifies that labour induction at weeks 40+ and 41+ remains both safe and effective for preventing caesarean sections and enhances foetal outcomes and decreases complications related to pregnancy extension.

LIMITATIONS

The study's very small sample size and single-center design may have limited how far the results may be applied. Furthermore, neonatal outcomes beyond the initial postpartum period were not assessed in the long run.

SUGGESTIONS / RECOMMENDATIONS

Based on the study findings, induction of labour at 40 weeks in primigravida women is associated with higher vaginal delivery rates and a lower incidence of caesarean sections compared to induction at 41 weeks. The success of induction within 48 hours was also greater at 40 weeks, indicating better maternal responsiveness. Maternal age showed no significant impact on induction outcomes, suggesting timing plays a more critical role than age. Therefore, early induction at 40 weeks is recommended to improve maternal and fetal outcomes.

CONFLICT OF INTEREST / DISCLOSURE

The authors declare no conflict of interest.

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