Original Article

Maternal and Neonatal Outcomes After Induction of Labor in Post-dated Pregnancy at Lady Reading Hospital, Peshawar

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Abstract

Objective: This study aimed to assess the feto-maternal outcomes following labor induction in postdated pregnancies.
Methodology: This observational, prospective cohort study was conducted in the Department of Obstetrics and Gynaecology at LRH, Peshawar, from September 10, 2020, to February 28, 2021. A total of 146 pregnant women with a gestational age of 41 weeks or more were enrolled in the study. All patients received 3 mg of dinoprostone tablets administered into the posterior vaginal fornix. Cesarean sections were performed in cases of fetal distress or prolonged labor. Fetomaternal outcomes were stratified by age, gestational age, and parity, and post-stratification chi-square tests were applied, with a significance level set at $p \leq 0.05$
Results: The study included women with an age range of 18 to 40 years, with a mean age of 27.828±2.60 years. The mean gestational age was 41.637±0.75 weeks, and the mean parity was 1.068±1.22. The findings revealed that 28.8% of cases required a Cesarean section, 24% experienced prolonged labor, 13% had postpartum hemorrhage (PPH), 17.1% developed a fever, 30.8% experienced fetal distress, 15.1% had macrosomia, and 9.6% had low Apgar scores after labor induction in postdated pregnancies.
Conclusion: Allowing spontaneous labor is a reasonable strategy for women with straightforward postdated pregnancies and a positive Bishop score. However, labor induction may be advantageous for those with a poor Bishop score.
Keywords: Postdated pregnancy, Induction of labor, Feto-maternal outcomes.

Cite this article as: Shah D, Khattak S, Qazi Q. Maternal and Neonatal Outcomes After Induction of Labor in Post-dated Pregnancy at Lady Reading Hospital, Peshawar. J Soc Obstet Gynaecol Pak. 2023; 13(3):251-255.

Introduction

A significant number of women with pregnancies that extend beyond 41 weeks often decide, in consultation with their healthcare providers, against choosing induction. Alternatively, individuals may opt for an elective caesarean section or choose an expectant management strategy, patiently awaiting the spontaneous onset of labor. The choice of a caesarean section (C-section) as a delivery method can be influenced by various factors, including the necessity to manage a prolonged pregnancy and the preferences of expectant mothers or their healthcare practitioners.

The process of inducing labor is a common obstetric procedure that involves the use of medication or various methods to initiate uterine contractions, with the aim of facilitating vaginal delivery.[1] The World Health Organization (WHO) recommends the induction of labor (IOL) for women who reach 41 completed weeks of pregnancy without experiencing spontaneous labor onset.[2] IOL rates vary widely around the world. In high-income nations, IOL was used in 25.4% of deliveries in Australia in 2010, 23.4% of deliveries in the United States in 2010, and 22.1% of deliveries in England in 2011 and 2012.[2] Rates also vary in low and middle-income countries (LMIC).[2] According to a WHO report on Maternal and Perinatal Health, IOL rates in facility deliveries were 4.4% in Africa (7 countries), 12.1% in Asia (9 countries), and 11.4% in Latin America (8 countries).

The induction of labor is a recommended intervention by the WHO aimed at mitigating potential complications associated with prolonged pregnancy,[4] including an

Authorship Contribution: [1,2]Substantial contributions to the conception or design of the work, acquisition, [4]analysis, or interpretation of data for the work, Drafting the work or revising it critically for important intellectual content, [3]Final approval of the version to be published, [5]Active participation in active methodology..

Funding Source: none
Conflict of Interest: none

Received: Mar 05, 2023
Accepted: Aug 19, 2023

increased risk of perinatal mortality, stillbirth, fetal growth restriction, meconium aspiration syndrome, and macrosomia.[4] However, the induction of labor is associated with potential risks such as uterine hyperstimulation, higher rates of instrumental delivery, uterine rupture, fetal distress, and the need for Caesarean section (CS).[5]

The decision to induce labor in cases of postdated pregnancies (≥41 weeks) is often not favored by a significant number of women and their clinicians. Instead, they may choose elective Caesarean section (ECS) or opt for an approach known as expectant management (EM), which involves waiting for labor to commence naturally.[5] The choice of a caesarean section may not only aim to manage the prolonged pregnancy but also align with the preferred mode of delivery for both women and their healthcare providers.[5] Addressing the issue of postdated pregnancies is advisable to promote the health and safety of both the mother and fetus.[6] Going beyond the expected due date increases the risk of conditions such as oligohydramnios, meconium-stained amniotic fluid, macrosomia, fetal post-maturity syndrome, and Cesarean delivery, all of which pose risks to both the baby and the mother. Prolonged pregnancy is well-recognized as a high-risk condition due to the documented increase in perinatal morbidity and mortality.[7]

This study investigates the fetal and maternal risks associated with postdatism pregnancies, highlighting a greater need for induction in such cases. The findings of this study emphasize the importance of considering induction of labor as a necessary intervention in these circumstances. Although there exist multiple suggestions for the management of post-term pregnancies, there is a lack of consensus on a widely approved strategy, leading to divergent approaches being used in different institutions and countries. Most of the research has been concentrated on the fetal outcomes associated with pregnancies that extend beyond the expected due date, which are evidently at risk. However, there has been comparatively little investigation into the mother outcomes, which are equally affected, as indicated by documented instances of maternal problems. The findings from this study will contribute to updating guidelines for managing post-term pregnancies in our general population.

Methodology

This prospective cohort study was conducted in the Obstetrics and Gynaecology department at LRH, Peshawar, from September 10, 2020, to February 28, 2021. A sample size of 146 was determined using the WHO sample size calculation, with a 95% confidence interval, a 4% margin of error, and an expected prevalence (Low APGAR score) of 6.5%. Non-probability consecutive sampling was employed for participant selection. The study included women aged 18 to 40 years, with singleton pregnancies confirmed by ultrasound, parity ranging from 0 to 4, gestational age of 41 weeks or more according to the last menstrual period (LMP), and a cephalic presentation confirmed by ultrasound. Patients with polyhydramnios, eclampsia, antepartum hemorrhage, and congenital anomalies visible on ultrasonography were excluded from the study. Patients meeting the inclusion criteria from the Department of Obstetrics and Gynaecology at LRH, Peshawar, were enrolled in the study after obtaining permission from the ethical committee. Demographic information, including age, gestational age, and parity, was collected from the patients. Informed consent was obtained from each patient, emphasizing confidentiality and assuring them of the absence of risks associated with their participation in the study. All patients received dinoprostone tablets, with an initial dose of 3 mg administered into the posterior vaginal fornix.

Subsequent 3-mg tablet doses were given at intervals of 6 hours until the cervix achieved a favorable status (Bishop Score ± 8). Once the cervix was deemed favorable (Bishop score ± 8), the patient was transferred to the delivery suite for amniotomy. Cesarean section was performed in cases of fetal distress or prolonged labor. Data regarding fetomaternal outcomes was recorded based on predefined criteria on a specially designed form. Statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS) version 22. Frequency and percentage were calculated for categorical variables, including cesarean section, prolonged labor, postpartum hemorrhage, fever, fetal distress, macrosomia, and Low APGAR score. Age, gestational age, and parity were described as Mean ± SD. Fetomaternal outcomes were stratified by age, gestational age, and parity, and post-stratification chi-square tests were applied, with a significance level set at $p \leq 0.05$.

Data was entered into SPSS version 22.0 for analysis. Mean and SD were calculated for quantitative variables such as age, gestational age, Hemoglobin, and Serum Ferritin. Frequency and percentages were calculated for qualitative variables like side effects, including nausea, vomiting, and constipation. An independent sample t-

test was applied to compare Hemoglobin and Serum Ferritin levels between the two groups at the beginning of the study and at the 12-week completion. A chi-square test was applied to compare side effects between the two groups, with a significance level set at P value < 0.05.

Results

Age range in this study was from 18 to 40 years with mean age of 27.828±2.60 years, mean gestational age 41.637±0.75 weeks and mean parity was 1.068±1.22. C-Section was seen in 28.8%, prolonged labor 24%, PPH 13%, Fever 17.1%, fetal distress 30.8%, Macrosomia 15.1% and low Apgar score was 9.6% after induction of labor in postdated pregnancy. Stratification of fetomaternal outcomes was done with respect to age, gestational age and parity. Statistically significant results were obtained with stratification of C-section with age and parity and Stratification of Fetal Distress with respect to age and parity. (Table I-IV)

Discussion

Postdated pregnancy is linked to an increased risk of adverse maternal and neonatal outcomes. Induction of labor (IOL) is a common intervention employed to manage pregnancies that have exceeded their expected due date.[8] However, the decision to induce labor in prolonged pregnancy is complex and involves assessing the risks and benefits for both the mother and the baby.[8]

Table I: Stratification of C-Section with respect to age.

Age (years)	C-Section		P-value
	Yes	No	
18-30	28(23%)	94(77%)	0.000
>30	14(58.3%)	10(41.7%)	
Total	42(28.8%)	104(71.2%)	

Table II: Stratification of C-Section with respect to parity.

Parity	C-Section		P-value
	Yes	No	
0-2	28(23.3%)	92(76.7%)	0.002
3-4	14(53.8%)	12(46.2%)	
Total	42(28.8%)	104(71.2%)	

Table III: Stratification of Fetal Distress with respect to age.

Age (years)	Fetal Distress		p-value
	Yes	No	
18-30	31(25.4%)	91(74.6%)	0.001
>30	14(58.3%)	10(41.7%)	
Total	45(30.8%)	101(69.2%)	

Table IV: Stratification of Fetal Distress with respect to parity.

Parity	Fetal Distress		p-value
	Yes	No	
0-2	30(25%)	90(75%)	0.001
3-4	15(57.7%)	11(42.3%)	
Total	45(30.8%)	101(69.2%)	

Numerous studies have investigated the maternal and neonatal outcomes following IOL in prolonged pregnancy.[9] A significant randomized controlled trial conducted in Sweden revealed that IOL at 41 weeks of gestation reduced the risk of perinatal death and stillbirth when compared to expectant management beyond 41 weeks of gestation. [10] This study also demonstrated that IOL did not elevate the risk of cesarean delivery or other adverse maternal outcomes.[10]

According to the published Cochrane Database of Systematic Reviews, which encompassed 22 randomized controlled trials involving over 10,000 women, IOL in prolonged pregnancy was associated with a lower risk of perinatal death, meconium aspiration syndrome, and admission to the neonatal intensive care unit (NICU) compared to expectant management.[11,12]

Nonetheless, IOL was linked to a higher risk of cesarean delivery. In terms of maternal outcomes, the same Cochrane review revealed no significant difference in the risk of postpartum hemorrhage, maternal infection, or other adverse maternal outcomes between IOL and expectant management.[11,12]

We examined 146 patients who had exceeded their expected due dates, following a screening process based on predefined inclusion criteria. In our investigation, the majority of patients were under 30 years of age. Similar results were obtained from a study by Alexander J et al. The majority of patients were in the 20–30 age range, and the mean gestational age in groups 1 and 2 was 24.45.3 years and 245.3 years, respectively.[13] It's worth noting that women of advanced maternal age face an elevated risk of stillbirth throughout the gestational period, with the greatest risk occurring between 37 and 41 weeks.[13] In our study, the mean gestational age was 41.637±0.75 weeks. Alexander J et al, advocated similar results. Furthermore, a recent systematic review directed that a policy of inducing labor for females with postdated pregnancies, as contrasting to expectant management, is correlated with a reduced incidence of perinatal mortality and limited C-Sectionsz.[14]

In this study, C-Section was seen in 28.8%, prolonged labor 24%, PPH 13%, Fever 17.1%, fetal distress 30.8%,

Macrosomia 15.1% and low Apgar score was 9.6% after induction of labor in postdated pregnancy. In a study by Anand N, et al. has shown that frequency of caeseren section was 30.58%, prolonged labor 33.3%, postpartum hemorrhage 13.3%, fever 26.6% and fetal distress was 34.6% after induction of labor in postdated pregnancy.[15]

In another study by Maoz O, et al. has showed that frequency of caesarian section was 12.5%, macrosomia 11.5% and Low APGAR score was 6.5% after induction of labor in postdated pregnancy.[16] Our study revealed that fetal distress is the most prevalent warning for Lower Segment Cesarean Section (LSCS), mirroring the findings in Mahapatro's study, where fetal distress accounted for the most common reason for LSCS (65.5%).[17] Prolonged delivery was linked to a higher risk of perinatal complications, such as fetal distress and meconium aspiration syndrome.[18] Prolonged pregnancies also exhibited a higher rate of c-sectionz.[13]

The prompt initiation of labor as per time and delivery is a crucial determinant in assessing perinatal outcomes.[19] Notably, the majority of pregnancies that are deemed suitable for post-term induction are not truly post-term when evaluated based on ultrasound dates.[19] Irrespective of the classification of prolonged pregnancy as a risk factor necessitating intervention, the prevalence of postterm pregnancies can be significantly decreased through the implementation of a dating policy that disregards menstrual dates and relies solely on ultrasound dates to determine the anticipated delivery date.[20] Singhal et al.[13] conducted a comparable investigation that also shown a heightened occurrence of maternal and perinatal problems, such as poor Apgar scores and hospitalization to the Neonatal Intensive Care Unit (NICU). Based on the findings of our study, it is recommended that women be provided with the option of elective delivery after the gestational period reaches 41 weeks, provided that the dates have been confirmed.

Induction of labor should be offered to women with straightforward pregnancies, but women with any complicating conditions should be evaluated for a caesarean section (LSCS). The significance of this matter is in the clear potential for harm to the foetus. Prolonged pregnancy beyond the 40-week gestational period has been linked to heightened rates of perinatal morbidity and mortality, particularly among individuals who do not adhere to regular antenatal check-ups.

Conclusion

In the context of uncomplicated postdated pregnancies, it is recommended that women with favourable bishop scores be permitted to undergo spontaneous labour, whereas those with unfavourable bishop scores should be provided induction of labour. The negative consequence can be mitigated. Regular antenatal check-ups have been shown to reduce the occurrence of postdate pregnancy.

References

1. Tsakiridis I, Mamopoulos A, Athanasiadis A, Dagklis T. Induction of labor: an overview of guidelines. Obstetrical & gynecological survey. 2020 Jan 1;75(1):61-72.
2. Mya KS, Laopaiboon M, Vogel JP. Management of pregnancy at and beyond 41 completed weeks of gestation in low-risk women: a secondary analysis of two WHO multi-country surveys on maternal and newborn health. Reprod Health. 2017; 14(1):141.
3. Martin JA, Hamilton BE, Ventura SJ. National vital statistics reports. Report no. 1. Hyattsville, Maryland. United States of America: National Vital Statistics System; 2012.
4. Rydahl E, Eriksen L, Juhl M. Effects of induction of labor prior to post-term in low-risk pregnancies: a systematic review. JBI Database System Rev Implement Rep. 2019; 17(2):170-208.
5. Middleton P, Shepherd E, Crowther CA. Induction of labor for improving birth outcomes for women at or beyond term. Cochrane Database Syst Rev. 2018; 5(5):CD004945.
6. Rabie N, Magann E, Steelman S, Ounpraseuth S. Oligohydramnios in complicated and uncomplicated pregnancy: a systematic review and meta-analysis. Ultrasound Obstet Gynecol. 2017; 49(4):442-9.
7. Divon MY, Haglund B, Nisell H, Otterblad PO, Westgren M. Fetal and neonatal mortality in the postterm pregnancy: the impact of gestational age and fetal growth restriction. American journal of obstetrics and gynecology. 1998 Apr 1;178(4):726-31.
8. Alfirevic Z, Keeney E, Dowswell T, Welton NJ, Medley N, Dias S, Jones LV, Caldwell DM. Methods to induce labour: a systematic review, network meta-analysis and cost-effectiveness analysis. BJOG: An International Journal of Obstetrics & Gynaecology. 2016 Aug;123(9):1462-70.
9. Rydahl E, Eriksen L, Juhl M. Effects of induction of labor prior to post-term in low-risk pregnancies: a systematic review. JBI database of systematic reviews and implementation reports. 2019 Feb;17(2):170.
10. Wennerholm UB, Saltvedt S, Wessberg A, Alkmark M, Bergh C, Wendel SB, Fadl H, et al. Induction of labour at 41 weeks versus expectant management and induction of labour at 42 weeks (SWEdish Post-term Induction Study, SWEPIS): multicentre, open label, randomised, superiority trial. BMJ. 2019 Nov 20;367:l6131.
11. Middleton_P S, Morris_J C. Gomersall_JC. Induction of labour at or beyond 37 weeks' gestation. Cochrane Database of Systematic Reviews. 2020(7).
12. Gulmezoglu AM, Crowther CA, Middleton P. Induction of labor for improving birth outcomes for women at or beyond term. Cochrane Database Syst Rev. 2012;6:CD00494

13. Alexander J, Macer CL, Chan LS. Elective induction versus spontaneous labor: A prospective study of complications and outcome. Am J Obstet Gynecol. 1992; 166:1690-7.
14. Reddy UM, KO CW, Willinger M. Maternal age and risk of stillbirth throughout pregnancy in the United States. Am J Obstet Gynecol. 2006; 195(3):764-70.
15. Anand N, Shah H. A clinical study of maternal outcome in postdated pregnancy in a tertiary care hospital. Int J Reprod Contracept Obstet Gynecol. 2019; 8:3573-7.
16. Maoz O, Wainstock T, Sheiner E, Walfisch A. Immediate perinatal outcomes of postterm deliveries. J Matern Fetal Neonatal Med. 2019; 32(11):1847-52.
17. Mahapatro A. Fetomaternal outcome in pregnancy beyond 40 weeks. Int J Pharm Bio Sci 2015; 6:53-8.
18. Olicker AL, Raffay TM, Ryan RM. Neonatal Respiratory Distress Secondary to Meconium Aspiration Syndrome. Children (Basel). 2021 Mar 23;8(3):246.
19. Kota SK, Gayatri K, Jammula S, Kota SK, Krishna SV, Meher LK, Modi KD. Endocrinology of parturition. Indian journal of endocrinology and metabolism. 2013 Jan;17(1):50.
20. Bhriegu R, Agrawal M, Hariharan C. Assessment of maternal and perinatal outcome in postdated pregnancy. Journal of Datta Meghe Institute of Medical Sciences University. 2017 Jan 1;12(1):35.
21. Singhal P. Fetomaternal outcome following postdate pregnancy. A prospective study. J Obstet Gynecol India. 2001; 51:89-93.