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Comparison of Induction at 40+10 Weeks with Induction at 40 weeks for Caesarean Section Rate and Perinatal Outcome in Postdate Pregnancies

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ABSTRACT

Objective: To compare caesarean section rate and perinatal outcome among women with postdate pregnancies having one previous scar induced at 40+10 weeks and 40 weeks

Study Design: Quasi-experimental study.

Place and Duration of Study Obstetrics department, Pak Emirates Military Hospital Rawalpindi, Pakistan from Jan to Jun 2022

Methodology: The study was conducted on women with one previous scar who were booked cases in our department and did not have spontaneous vaginal delivery till 40 weeks of gestation. They were divided into two groups. One group had an induction of labor at 40 weeks, while the other had an induction at 40+10 weeks. Clinical parameters like rate of Caesarean section for delivery, meconium aspiration, hypoxic-ischemic encephalopathy, and meconium-stained liquor were compared in both groups.

Results A total of 413 women with one previous scar and post-dated pregnancies were recruited for this study. Two groups were made for comparison. 182(44.1%) mothers had induction at 40 weeks, while 231(55.9%) had induction at 40+10 weeks. 208(50.3%) had a vaginal birth after the caesarean section, while 205(49.7%) underwent a Caesarean section. Statistical analysis revealed that more caesarean rate, meconium aspiration, hypoxic-ischemic encephalopathy, and meconium-stained liquor were found in the 40+10 weeks group (p-value<0.05).

Conclusion Induction at 40 weeks turned out to be a better option in women with postdate pregnancies when compared to induction at 40+10 weeks in terms of rate of Caesarean section, meconium aspiration, meconium stained liquor, and hypoxic-ischemic encephalopathy.

Keywords: Comparison; Induction of labor; Postdate pregnancies.

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INTRODUCTION

Evolution in obstetrics has enabled the treating teams to intervene effectively via various modes at various stages in women who did not undergo spontaneous labour. These new interventions during labour have reduced both maternal and fetal mortality and morbidity.[1] Our country is still in the developing phase, especially when it comes to primary and secondary care services, and most of the burden of postdate or complicated pregnancies is handled by tertiary care units.[2] Postdate pregnancies, if not intervened in time may result in untoward maternal or neonatal outcome.[3]

Different definitions related to gestational age are used cautiously to ascertain the mother and baby's well-being during pregnancy. Women reaching 39 weeks of gestation are generally considered at full term.[4] Several interventions could be offered to these women depending upon personal factors, choice, and facilities available.[5] Induction of labor is one of the most commonly offered options to these women, which could be done at different points of time after the completion of 40 weeks of gestation.[6]

Comparisons have been made in different setups regarding the best time for induction of labor in women with postdate pregnancies.[7] Keulen, *et al.*, published a multi-center, randomized non-inferiority trial comparing induction of labor at 41 weeks with expectant management until 42 weeks. It was concluded that perinatal outcomes were better in women who induced labor at 41 weeks as compared to those who had expectant management until 42 weeks.[8] Wennerholm *et al.*, published a similar multicentre, open-label, randomized, and superiority trial. They came up with the findings that most perinatal parameters were not different in both groups. However, the chances of stillbirths were slightly higher in women who had expectant management until 42 weeks.[9]

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Follow-up of patients and keeping their track is challenging in our system. Responsibility primarily lies on patients who are sometimes unaware of the condition and consequences of their decisions. In these circumstances, expectant management sometimes becomes risky, and that too when two human lives are involved, as in the case of pregnant women. A local study evaluated the role of different treatment options for inducing labor in postdate pregnant women. 10 Limited work has been done to evaluate different options regarding the best time for inducing labor. We, therefore, planned this study with the rationale of comparing Caesarean section rate and perinatal outcome among women with postdate pregnancies induced at 40+10 weeks and 40 weeks.

METHODOLOGY

The quasi-experimental study was conducted at the Obstetrics and Nursing Intensive Care Units of the Pak Emirates military hospital Rawalpindi, Pakistan from January to June 2022. The sample size was calculated by the WHO Sample Size Calculator using two groups. Group-I had women with induction at 40 weeks, 1.16%, while Group-II had patients with 40+10 weeks' induction, 0.7%.[11]

Inclusion Criteria: All pregnant women with one previous scar between the ages of 18 and 40 years who were booked cases and had not undergone spontaneous labor till 40 weeks of gestation were recruited.

Exclusion Criteria: Mothers with uncontrolled systemic illnesses like DM, HTN, IHD, or any autoimmune disorders or those with anatomical abnormalities of the uterus or vagina were excluded. Mothers with neonates born with severe congenital malformations, those who could not survive at the time of birth, or those who had intrauterine death were excluded as well. Those who refused to undergo any specific mode of delivery or had complications during delivery due to the mode of delivery were not included in the study. Those who were not booked cases at our unit and presented with postdate pregnancy were also excluded.

After approval from the Ethical Review Board Committee (via IREB letter no, A/28/ref331/2021), all the women who presented with postdate pregnancy and met the criteria for this study were recruited after their consent. Pregnancy was termed as postdate if no spontaneous labor had occurred till the end of the 40th week of gestation (Figure).[12] Postdates women were divided into two groups on the basis of the time at which they would be offered an induction. Women in one group were induced at 40 weeks, while women in the other group were induced within 40+10 weeks. The labor induction was done with the help of the tablet Dinoprostone using the standard protocol in both groups.[13] Women with unsuccessful induction underwent a Caesarean section in the operation theatre adjacent to the labor room. Outcome parameters (meconium aspiration, hypoxic-ischemic encephalopathy, and meconium-stained liquor) were observed by a consultant neonatologist within the first 48 hours of the birth of a baby.[14]

Statistics Package for Social Sciences version 24.0 (SPSS-24.0) was used for all the above-mentioned analyses. Descriptive statistics were used to present the relevant sociodemographic and other variables generated during the study. Pearson chi-square analysis and Fischer's exact test were used to establish statistically significant differences among the two study groups. The *p*-values less than or equal to 0.05 were considered significant for establishing the comparison between variables within the two groups.

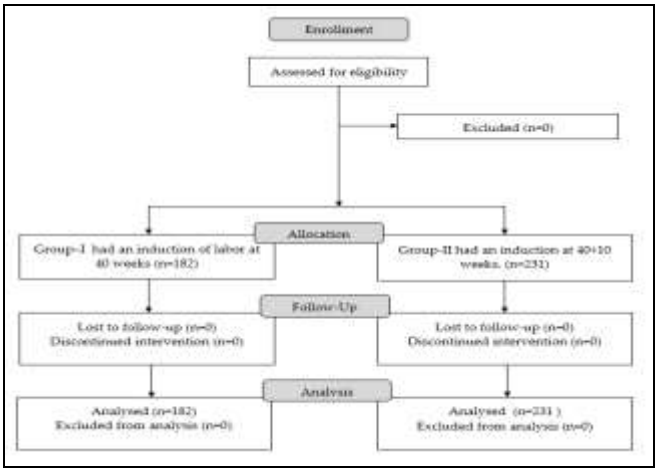

Figure: Patient Flow Diagram (n=413)

RESULTS

Four hundred thirteen women with one previous scar and postdated pregnancies were recruited for this study. Two groups were made for comparison. 182(44.1%) mothers had induction at 40 weeks, while 231(55.9%) had induction at 40+10 weeks. Table-I shows the basic characteristics of mothers and neonates included in this study. Out of 413 women, 208(50.3%) had a vaginal birth after the caesarean section, while 205(49.7%) underwent a Caesarean section. In our analysis, 213(51.5%) neonates were male, while 200(48.5%) neonates were female. Out of

the total neonates recruited in the study, 23(5.5%) had meconium aspiration, 06(1.4%) had hypoxic-ischemic encephalopathy, and 10(2.4%) had meconium-stained liquor.

Table-II reveals the results of the statistical analysis. Two study groups were made for the sake of comparison. One Group had induction at 40 weeks, while the other was at 40+10 weeks. It was revealed that out of the two study groups, a higher caesarean rate was seen in women who underwent induction at 40+10 weeks (*p*-value-0.007). Regarding perinatal complications, meconium aspiration (*p*-value-0.001), hypoxic-ischemic encephalopathy (*p*-value-0.008), and meconium-stained liquor (*p*-value-0.017) were found statistically significantly more in 40+10 weeks' Group as compared to 40 weeks Group.

Table-I: Characteristics of Mothers and Neonates Included in the Study (n=413)

Study parameters	n(%)
Age of mothers (years)	
Mean±SD	34.453±5.535 years
Range (min-max)	19-39 years
Gender of Neonates	
Male	213(51.5%)
Female	200(48.5%)
Caesarean Delivery	
No	208(50.3%)
Yes	205(49.7%)
Poor Neonatal Outcomes	
Meconium aspiration	23(5.5%)
Hypoxic Ischemic Encephalopathy	06(1.4%)
Meconium stained liquor	10(2.4%)
APGAR<7 at 5 minutes	02(0.4%)
Others	02(0.4%)
Neonatal death	01(0.2%)

Table-II: Comparison of Outcome Parameters in Study Groups (n=413)

Outcome Parameters	Induction at 40 weeks (n=182)	Induction at 40+10 weeks (n=231)	*p*-value
Cesarean Section			
No	78(42.8%)	130(56.2%)	0.007
Yes	104 (57.2%)	101(43.8%)	
Meconium Aspiration			
No	179(98.3%)	211(91.3%)	0.001
Yes	03(1.7%)	20(8.7%)	
Hypoxic Ischemic Encephalopathy			
No	182(100%)	225(97.4%)	0.008
Yes	00(0%)	06(2.6%)	
Meconium Stained Liquor			
No	181(99.4%)	222(96.1%)	0.017
Yes	01(0.6%)	09(3.8%)	

DISCUSSION

Mothers who do not have spontaneous labor at term or babies who are not born at term may have specific problems that need the attention of teams managing the pregnancy and neonates. Postdate pregnant women can be induced into labor at any time as term time has already passed. Still, a debate has been going on about what is the most suitable time for induction, which would result in a minimum number of complications for mother and baby. Local data has been limited, and studies in other parts of the world have shown heterogeneous results. This study was conducted to compare Caesarean section rate and perinatal outcome among women with postdate pregnancies induced at 40+10 weeks and 40 weeks at the obstetric unit of Pak Emirates Military Hospital Rawalpindi.

Darney *et al*., conducted a study in 2013 regarding differences in neonatal and maternal outcomes among women who were induced labor and those who underwent expectant management. It was revealed that the Caesarean section was lower in women who underwent induction of labor as compared to those who had expectant management. Neonatal outcomes were not different among the two groups.[15] Our results supported their results regarding Caesarean section rates as in our study, they were higher in women who underwent induction at 40+ weeks compared to those who underwent induction at 40 weeks.

A systematic review and meta-analysis was published by Wennerholm *et al*. in search of any difference in the outcome of postdate pregnant women undergoing labor induction at 40 weeks or expectant management. They concluded that perinatal mortality was not different in the two groups; however, the cesarean rate was lower in women who underwent induction at 40 weeks.[16] Our results revealed that induction at 40 weeks turned out to be a better option in women with postdate pregnancies when compared to induction at 40+10 weeks in terms of rate of cesarean section, meconium aspiration, meconium stained liquor and hypoxic-ischemic encephalopathy.

A prospective cohort study alongside a randomized controlled trial was published in 2022, which analyzed women with late-term pregnancy and compared the outcome of induction of labor vs. expectant management. It was found that there was no statistically significant difference in any maternal or neonatal outcome in both types of management

plans.[17] Our results were different from this as the rate of cesarean section and neonatal outcome parameters were both found to be better in women who were induced labor at 40 weeks. Differences in clinical setting and quality of expectant management may cause this difference in results. Middleton *et al.*, published a review in 2018 comparing the outcomes of women who were induced labor to those who waited until 40+ weeks for spontaneous labor.[18] Cesarean section rate and neonatal outcomes were both found to be better in women who were induced labor. Our results supported the findings conducted by Middleton *et al.*

LIMITATIONS OF STUDY

One tertiary care obstetric unit was targeted for data collection, which may not be representative of a considerable population managed at different public and private sector rural and urban hospitals. Multiple factors other than the time of induction of labor may be associated with the need for a Caesarean section in these patients or the presence of perinatal complications. Strict control of these confounding factors and data collection from multiple obstetric settings in future studies may generate results representative of the local population.

CONCLUSION

Induction at 40 weeks turned out to be a better option in women with postdate pregnancies when compared to induction at 40+10 weeks in terms of rate of Caesarean section, meconium aspiration, meconium stained liquor, and hypoxic-ischemic encephalopathy.

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Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

AY & RA: Data acquisition, critical review, approval of the final version to be published.

F & LM: Conception, study design, drafting the manuscript, approval of the final version to be published.

HS & ST: Data analysis, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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