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FETAL OUTCOMES OF LABOUR INDUCTION AT 40 AND 41 WEEKS OF GESTATION.

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ABSTRACT

BACKGROUND: Labor induction is frequently carried out between weeks 40 and 41 of pregnancy in order to enhance outcomes for both the mother and the fetus and to lower perinatal problems. Objective of the study to assess the frequency of fetal outcome of labour induction at 40 and 41 weeks of gestation. **MATERIALS AND METHODS:** This cross-sectional study was carried out from 1st of March 2023 to 31st July 2023 at DHQ Mardan. The study comprised 188 pregnant women who had labor induction at 40 and 41 weeks of gestation. The statistical analysis was carried out with SPSS version 26. **RESULTS:** The mean age in this study was 30.52±6.54 years. Among these women 124 65.96 % were in their 40 gestational week while 64 34.04% were in their 41 gestational week. Number of primigravida was 113 60.11% while multigravidas were 75 39.89%. C-section was performed in 39 20.74% cases while 149 79.25% were vaginal deliveries. The results of primary outcomes of the study showed significantly increased adverse fetal outcomes such as admission in NICU 32.81 Vs 16.13%, p=0.008, meconium aspiration syndrome 26.56 Vs 14.52%, p=0.044, fetal distress 28.12 Vs 15.32%, p=0.05, macrosomia 18.75 Vs 8.06, p=0.03, asphyxia 18.75 Vs 8.87, p=0.05 and still birth 6.25 Vs 0.80 % , p=0.027 in Group-B compared to Group-A. **CONCLUSIONS:** There is a significant increase in adverse fetal outcomes between 41-42 weeks compared to between 40-41 weeks of gestation. Induction of labour after 40 week is advisable for improved fetal health.

KEYWORDS: Adverse fetal outcome, Gestational age, Labour induction.

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INTRODUCTION

The safe period for the fetus to be able to go through the stress of labour and adjust in ex-utero environment is believed to be 37 weeks of gestation counted from the 1st day of last menstruation. Gestation period between 39-40 weeks is mentioned as good with the minimal risk of adverse fetal outcomes. When this gestation goes beyond 40 weeks, it's called as post-dated, while beyond 42 weeks, it's is considered post-term pregnancy. Recommendations for planned repeat cesarean delivery start from 39 weeks as it's found to be safe for the fetus to now adjust in to an ex-utero environment.[1]

The global incidence of post term pregnancy is 5-10%. Post term or prolonged pregnancy is related to some serious maternal as well as fetal risks. The major associated fetal risks are still birth, meconium aspiration syndrome MAS, low Apgar score, NICU admission, fetal distress due to meconium stained liquor MSL, birth asphyxia and macrosomia. Among these MAS alone is highly associated with the risk of respiratory morbidity and short term neonatal morbidity.[2] Similarly the cases of still birth rises after 39 weeks and a sudden increase in the incidence is reported after 40 weeks. The induction of labour is suggested before 42 weeks of gestation to prevent these serious adverse events as the results of studies conducted over the topic have favored the induction of labour before the 42 week and shows benefits over the risks associated with inductions. The argument for waiting until the 41 week on the other hand is the chances of vaginal delivery through spontaneous labour with better bishop score and there are concerns of both the patients and the clinicians regarding failure of the induction procedure and about the cesarean section surgery. [3] A Cochrane review published in 2018 comprising of 30 RCTs concluded that there are better maternal and fetal outcomes including caesarean sections, perinatal deaths, and admission to NICU and Apgar scores with induction of labour from 37 gestational weeks compared to the strategy of expectant management. This review is more important for our population as 7 out of these 30 RCTs were from South East Asia. The review however expressed the need of more data in shape of risk profiles and benefits.[4]

During past few decades there is a rise in the ratio of induction of labour at term 37 + 0 gestational Weeks not only in high income countries but also in middle and low income countries. Induction of labour is however advised to be performed in presence of clear medical indications and after weighing benefits over the harms.[5,6] The main reason for elective induction of labour after 40 weeks of gestation often given by health professionals of south Asia is the risk of fetal morbidity due to earlier loss of placental functions.[7,8,9] The optimal time for this decision of induction of labour is however still under discussion as the amount of reduction in perinatal mortality by induction of labour is not clearly estimated and will be purely based on the maternal and fetal outcomes.[10,11]

A difficulty regarding definite data on this subject is that the trials were mostly planned to find the outcomes by comparing different management strategies, while a simple observational design for assessing the outcomes of daily medical practices are rare.[12]

As per discussed above, a comparison of fetal outcomes at 40 and 41 weeks of gestation is important in deciding the timing for induction of labour. Hence, primary objective of this study was to determine the frequency of adverse fetal outcomes of labour induction at 40 or 41 week of gestation in our local population. The results of this study will help the gynecologists to make better decision regarding labour induction at our local health care centers.

METHODS:

This cross-sectional study was carried out at the Department of Gynaecology and Obstetrics District Head Quarter Hospital, Shahbaz Garhi, Mardan from March 1, 2023, and July 31, 2023 over a period of 5 months.

Sample size was calculated as per following assumptions:

Prevalence= 8.55%, Precision= 4%, Population size= Infinite

Confidence interval=95% with specified limits 4.55%--12.55%

n=188.[13,14]

A total of 188 women with 40 -42 week of gestation, having uncomplicated singleton pregnancy and planned for labour induction were included in this study using consecutive sampling technique.

Women in Group A were those whose gestational age was between 40 and 41 weeks, while Group B was those whose gestational age was between 41 and 42 weeks were included in this study. Any obstetric or medical issues, including a history of fetal abnormalities, placenta previa, hypertensive disorders, or a prior lower segment cesarean section LSCS, were excluded from the study. The gestational age was determined using the last menstrual period LMP. Demographics such as gestational age, parity, mother age, and other pertinent clinical data were noted at the time of inclusion. Primary outcome of the study was the increase in the incidence of adverse fetal outcomes in shape of admission rate at NICU, Apgar score < 7, meconium aspiration syndrome, fetal distress, macrosomia, birth asphyxia or still birth in Group-B compared to group-A.

Ethical approval of conducting the study was taken from the ethical committee of the hospital.

The study purpose was explained and consent was taken from the participants on written forms.

Data analysis was performed using SPSS Chicago, IL, USA version 26. Mean and standard deviation were calculated for quantitative parameters while qualitative parameters were expressed in shape of frequency and percentage. The study outcomes between the 2 groups were compared by applying Chi-square test, where $p \leq 0.05$ was considered statistically significant keeping.

RESULTS

The mean age in this study was 30.96±6.19 years with an age range of 19-46 years. The group wise details of age are shown in table-I.

Table-I: Comparison of Mean ± SD Age Between Group A and Group B n = 188

Demographics	**Group-A n=124**	**Group-B n=64**
Age Mean±SD years	30.16±5.46	32.53±7.2

All the patients were in 40 and 41 gestational week. Both primigravida and multigravida patients were included in this study. C-section was performed in patients where needed. The details are as shown in table-II.

Table-II: Gestational Characteristics and Mode of Delivery in Group A and Group B n = 188

Clinical Characteristic		**Group-A n=124%**	**Group-B n=64%**
Gravida	**Primigravida n %age**	84 67.74	49 76.56
	Multigravida n %age	40 32.25	15 23.43
Mode of delivery	**Vaginal n %age**	99 79.84	50 78.12
	C-section n %age	25 20.16	14 21.88

Fetal outcomes were recorded for these deliveries including admission at Neonatal ICU, Apgar score < 7 at 1 min and at 5 min, meconium aspiration syndrome, meconium aspiration liquor MSL with fetal distress, macrosomia, birth asphyxia

or still birth. Details of these fetal outcomes reported in this study are shown in Table-III.

Table-III: Comparison of Fetal Outcomes Between Group A and Group B n = 188

Fetal Out Comes	Group-A n=124%	Group-B n=64%	p-value
Admission in Neonatal ICU n %	20 16.13	21 32.81	0.008
Meconium aspiration syndrome n%	18 14.52	17 26.56	0.044
Apgar<7 in 1 min n %	9 7.26	12 18.75	0.019
Apgar<7 in 5 min n %	3 2.42	8 12.5	0.005
MSL with fetal distress n%	19 15.32	18 28.12	0.05
Macrosomia n%	10 8.06	12 18.75	0.03
Asphyxia n %	11 8.87	12 18.75	0.05
Still Birth n %	1 0.80	4 6.25	0.027

DISCUSSION

Multiple studies have been conducted discussing the fetomaternal outcomes of the post term pregnancies as there is increase in perinatal risk with increasing gestational age, hence most of the guidelines recommend induction of labour to be performed in women who have completed 41 gestational week. There is however, relatively less data available focused on comparison of fetal outcomes of labour induction at 40 and 41 weeks of gestation.

A study conducted by Sinkey RG *et al* mentioned a higher still birth risk after passing gestation of 39 week and favored the induction of labor in the post-dated women at 41 week of gestation to reduce the chances of adverse fetal outcomes.[15]

A recently published study by Chhetri PB included 152 women where 86% were between 40-41 & 41-42 weeks of gestation. Vaginal deliveries were mostly observed in women between 40-41 weeks 77.90% while C-section was performed in majority of women between 41-42 weeks of gestation 64.28%. Fetal distress with MSL was most commonly reported adverse outcome 36.06%. Admissions to the NICU was reported to be 16.44% and MAS in 8.55%. Low Apgar score of < 6 in 1 min was reported in 14% of the cases while low Apgar score of < 6 in 5 min was reported in 5% of the cases.[14]

A systemic review conducted by Muglu J *et al.* found that the risk of still birth rises from 37 gestational weeks and onwards. This meta-analysis covering the data of 15 Million pregnancies reported the risk of still birth raised rapidly from 37 to 42 week from 0.11 to 3.18 per 1000 respectively. An important finding of this analysis was a comparison between the 41 and 40 gestational weeks which found that this risk of still birth is raised up to 64% and gives suggestion to go for elective induction of labour before the 41st gestational week.[16]

A study in Pakistan by Haq AI was planned to find the need for fetal monitoring in women with low risk pregnancies in their 40 and 41 weeks of gestation. The women with gestation of 40 to 40+6 weeks were added in Group-A while the women with gestation of 41 to 41+6 weeks were added in Group-B. The results showed that the incidence of MSL increased in patients going to 41+6 week of pregnancy as women in Group-B had higher incidence of MSL 42.04% compared to Group-A 30.41%. The study concluded that appropriate interventions must be taken into considerations at 40 weeks to minimize the risk of adverse events which keep on rising as the days passes after this period. [17]

Golait S. and Soni S. compared the fetal outcomes of deliveries at 40-41 weeks Group-I and 41-42 weeks Group-II of gestation. The study reported significantly higher cases of MAS in Group-II compared to Group-I 31.87% Vs 17.64 respectively, p=0.013. There were also higher incidences of important adverse

fetal outcomes in Group-II compared to Group-I such as MSL 22% Vs 17%, birth asphyxia 9.09% Vs 5.88%, fetal distress 7% Vs 6%, macrosomia 13% Vs 5% and birth weight>2.5 Kg 65% Vs 32%. The study therefore concluded that increased risk of adverse events for the babies and the mothers are associated with increasing gestational age and appropriate management must be planned keeping the fetal risks inconsideration .[18]

The mean age in our study was 30.52±6.54 years with an age range of 19-46 years. Among these women 124 65.96 % were in their 40 gestational week while 64 34.04% were in their 41 gestational week. Number of primigravida women was 113 60.11% and multigravidas were 75 39.89%. C-section was performed in 39 20.74% cases while 149 79.25% were vaginal deliveries.

The results of primary outcomes of the study showed significantly increased fetal outcomes such as admission in NICU 32.81 Vs 16.13%, p=0.008, meconium aspiration syndrome 26.56 Vs 14.52%, p=0.044, fetal distress 28.12 Vs 15.32%, p=0.05, macrosomia 18.75 Vs 8.06, p=0.03, asphyxia 18.75 Vs 8.87, p=0.05, Apgar<7 in 1 min 18.75 Vs 7.25, p=0.019, Apgar<7 in 5 min 12.5 Vs 2.42, p=0.05 and still birth 6.25 Vs 0.80 % , p=0.027 in Group-B compared to Group-A.

As found in previous studies MAS, NICU admissions and fetal distress due to MSL were the most frequent complication in women after 41week compared women in 40-41 week of gestation. These results are in line with the results of previous studies conducted to find the fetal outcomes when labour was induced in these gestational weeks.[14,15,16,17,18]

The findings of this study are important for the gynecologists in making better decisions in our gynecological and obstetrics units regarding induction of labour after 40 week of gestation. The major limitation of the study is the small sample size therefore future studies with larger sample size will help in providing more useful evidence in this regard.

CONCLUSION

Post-dated pregnancies at 40 and 41 weeks of pregnancy are characterized by adverse fetal outcomes. Intervention at 40 weeks is suggested for better outcomes for these post-dated gestations. Avoidance of post term deliveries and induction of labour at an early stage is advisable in our hospital set ups for improved fetal health.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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AUTHORS' CONTRIBUTIONS:

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared

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