

ORIGINAL ARTICLE

Fetal Outcome among Women with Postdate Pregnancy

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ABSTRACT

OBJECTIVE: The study aimed to determine the mode of delivery and fetal outcome among women with postdated pregnancies.

METHODOLOGY: This cross-sectional study was conducted from July to December 2020 in the Department of Gynecology, Hayatabad Medical Complex, Peshawar. A total of 287 women with postdated pregnancies (beyond 41 weeks) were selected through a convenient sampling technique for the study and followed to detect expected fetal outcomes. All women of age 20-45 with no signs of labor onset and cephalic presentation of singleton pregnancy were included, while women with retained placenta detected by ultrasound, women with a medical disorder like coagulopathies (Haemophilia, Von Willebrand disease, Thrombocytopenia, DIC, Protein S deficiency, Protein C deficiency) detected by the specific investigation were excluded from the study. Data was analyzed using SPSS version 20.

RESULTS: The mean age of the sample was 30.5 years, with a standard deviation of 6.1 years. The mean parity of the sample was 2.1±1.5. The mean BMI of the sample was 26.1±3.8kg/m². On follow-up, fetal distress in 16%, macrosomia in 18.5%, birth asphyxia in 18.1%, meconium aspiration in 8.4% and NICU admission in 9.1%. None of the neonates died in this study.

CONCLUSION: Postdated pregnancy carries a high risk of fetal distress, macrosomia and birth asphyxia. We recommend more large-scale surveys as well as trials to determine the efficacy of induction before pregnancy enters the postdate period and reduce the morbidity and mortality due to postdate pregnancies.

KEYWORDS: Postdate Pregnancy, Meconium Aspiration, Birth Asphyxia, Fetal Distress, Intrauterine Growth Restriction, Macrosomia.

INTRODUCTION

Post-term pregnancy, characterized by a gestational duration beyond 287 days (41 weeks), is a significant phase in obstetrics that is linked to a heightened likelihood of perinatal problems. It constitutes roughly 5-10% of all births, representing a noteworthy problem within maternal and fetal healthcare¹. Post-term pregnancies exhibit regional disparities, with rates ranging from 0.4% in select European nations to over 7% in others^{2,3}. Nevertheless, it is worth noting that there is a significant shortage of data about the frequency of post-term pregnancies within the Pakistani community, hence underscoring the need for conducting indigenous investigations in this domain⁴.

Prolonged gestation beyond 41 weeks is associated with various problems, as shown by a twofold increase in perinatal death rates and a five- to sevenfold increase in perinatal morbidity rates compared to pregnancies that reach 40 weeks⁵. Significant hazards to the developing fetus arise from the occurrence of protracted pregnancy, including potential complications like meconium aspiration, birth traumas, and hypoxia. Nonetheless, the primary issue of utmost importance for both pregnant women and healthcare professionals is the potential threat of fetal demise.

The rates of stillbirth related to gestational age, measured as the number of stillbirths per 1000 total births at each week of gestation, are sometimes misinterpreted as representing the actual likelihood of stillbirth. According to previous studies, it has been shown that around 16% of pregnancies that extend beyond the expected gestational period have adverse outcomes. These outcomes are determined based on specific criteria, including umbilical artery pH levels below 7.10, 5-minute Apgar scores below 7, the need for cesarean birth due to fetal distress, and admission to the newborn intensive care unit⁶. In contrast, it was shown that late-term pregnancies had notably reduced rates of cesarean section and surgical vaginal birth⁷.

In addition, it has been shown that pregnancies that extend beyond the expected length are linked to a higher likelihood of newborn problems, such as hospitalizations to the newborn Intensive Care Unit (NICU), respiratory issues, and infectious diseases^{6,7}. Fetal demise also exhibits a discernible escalation in chances ratios starting at 41 weeks of gestation and beyond⁸.

Based on the concerning issues seen, research has shown that the option of induction should be made available to women who have reached 41+0 to 42+0 weeks of gestation. This recommendation is based on existing data, which suggests a reduction in perinatal death rates while not posing an increased risk of Caesarean section⁹.

An in-depth analysis of fetal outcomes in pregnancies that extend beyond the expected due date finds notable difficulties. According to research, the prevalence of intrauterine growth restriction was found to be 33.7% among infants, while birth asphyxia afflicted 19% of the newborns and fetal distress was seen in 20%¹⁰. A further research investigation presented more alarming data, indicating that newborn asphyxia, meconium aspiration syndrome (MAS), and fetal distress were seen in 32.46%, 70.12%, and 64.93% of babies, respectively¹¹. Furthermore, it has been shown that infants born from pregnancies that are beyond the expected due date tend to have a higher birth weight, with around 19.2% of these infants being categorized as macrosomic. In addition, it was found that 22.4% of the participants had Apgar scores below 7. Moreover, several problems were seen, including meconium-stained fluid, meconium aspiration syndrome (MAS), hospitalizations to the newborn intensive care unit, and birth asphyxia, which occurred in 23.2%, 12.4%, 18.8%, and 1.2% of cases, respectively¹².

The objective of this research is to examine the prevalence of typical fetal outcomes in women with pregnancies that extend beyond the estimated due date. By illuminating the

negative fetal consequences linked to pregnancies that extend beyond the expected due date, our research outputs will provide significant contributions to the knowledge base of obstetricians and paediatricians; this will aid in their comprehension of the disparities in statistical data seen among diverse communities. Moreover, the findings of this study will make a valuable contribution to the accumulation of regional empirical data and provide insights for formulating prompt research and policy suggestions to mitigate unfavorable fetal outcomes in women with pregnancies that extend beyond the expected due date. This research study represents a pivotal stride in enhancing the provision of treatment and optimizing the outcomes for pregnancies beyond the anticipated gestational period.

METHODOLOGY

This cross-sectional study was conducted in the Gynecology department of Hayatabad Medical Complex, Peshawar, Pakistan. The study was carried out from July to December 2020. The sample size was calculated per the World Health Organization (WHO) calculator with a 4.9% proportion of neonatal death among women postdate pregnancy, 95% confidence level and 2.5% margin of error. A non-probability convenient sampling technique was used for patient recruitment. All women of the age group from 20 to 45 years with postdate pregnancy scheduled for induction with no signs of the onset of labor and women with a cephalic presentation along with singleton pregnancy were included in the study. While women with genital tract injuries (vaginal, cervical, perineal tears, and tears extending to lower uterine segments and broad ligaments hematoma) detected by local examination, women with retained placenta or membranes seen by examination ultrasound, women with medical disorders like coagulopathies (Haemophilia, Von Willebrand disease, Thrombocytopenia, DIC, Protein S deficiency, Protein C deficiency) detected by specific investigation (factor VIII deficiency and Disseminated Intravascular Coagulation) were excluded from the study.

Moreover, the women with IUGR babies were also excluded from the study. Ethical approval of the CPSP research committee was obtained. All patients meeting the inclusion criteria were included in the study (i.e. women with singleton pregnancy and having postdate pregnancy with no signs of the onset of labor) through OPD or Emergency. Informed consent in written form was obtained from the patient or their attendants.

All women were subjected to detailed history and clinical examination. Induction of labor was done in all women using 25ugs of tablet misoprostol placed digitally in the posterior fornix of the vagina. All women were followed up at regular intervals till the delivery of the baby to determine the common fetal outcome like birth asphyxia, intrauterine growth retardation, NICU admissions, macrosomia, meconium aspiration syndrome, fetal distress, and neonatal death. All these observations were made under supervision of an expert obstetrician with a minimum of five years of experience. Strictly following exclusion criteria controlled confounders and bias. All the information including name, age, and address, was recorded in apredesigned proforma.

Data was analyzed using SPSS version 20. Categorical variables like common fetal outcome (birth asphyxia, intrauterine growth retardation, NICU admissions, macrosomia, meconium aspiration syndrome, fetal distress, and neonatal death) were described in terms of frequencies and percentages, whereas mean \pm SD was computed for numeric variables like age, parity, and BMI. The common fetal outcome was stratified among the age, parity and BMI to see the effect modifiers using the chi-square test, keeping a p-value of ≤ 0.05 as significant. Results were presented in tables and diagrams.

RESULTS

Two hundred eighty-seven women presented with a duration of pregnancy beyond 41 weeks. The mean age of the sample was 30.5 years, with a standard deviation of 6.1 years. We distributed the women in three age groups. The mean parity of the sample was 2.1 ± 1.5 . See **Table II** for categories of parity). The mean BMI of the sample was $26.1 \pm 3.8 \text{kg/m}^2$ (See **Table III** for categories) (**Table I**). On follow-up, fetal distress in 16%, macrosomia in 18.5%, birth asphyxia in 18.1%, meconium aspiration in 8.4% and NICU admission in 9.1%. None of the neonates died in this study (0%). The subsequent table indicates the fetal outcome stratification concerning the mother age group, parity and BMI (**Table II-V**).

Table I: Patient distribution according to age, frequency of parity, and BMI (n=287)

According to age		
Age groups	Frequency	Percentage
18-25 years	55	19.2
25-35 years	199	69.3
35-45 years	33	11.5
Total	287	100.0
Frequency of parity (Nulliparous & Multipara)		
Parity	Frequency	Percentage
Nulliparous	67	23.3
Multipara	220	76.7
Total	287	100.0
Body Mass Index of pregnant females		
BMI (kg/m²)	Frequency	Percent
20-25.5	134	46.7
> 25.5-29.9	97	33.8
> 29.9-32	56	19.5
Total	287	100.0

Table II: Frequency of Fetal Outcome

Fetal Outcome		Frequency	Percent
Fetal distress	Yes	46	16.0
	No	241	84.0
Macrosomia	Yes	53	18.5
	No	234	81.5
Asphyxia	Yes	52	18.1
	No	235	81.9
Meconium aspiration	Yes	24	8.4
	No	263	91.6
NICU admission	Yes	26	9.1
	No	261	90.9

Table III: Age-wise distribution of IUGR, Fetal distress, Macrosomia, Asphyxia, Meconium aspiration, and NICU

Age Groups		18-25 years % (n)	> 25-35 years % (n)	> 35-45 years % (n)	Total % (n)
Fetal distress	Yes	0.0 (0)	21.5 (43)	9.1 (3)	16.0 (46)
	No	100 (55)	78.4 (156)	90.9 (30)	84.0 (241)
	P-value	< 0.001			
Macrosomia	Yes	41.8 (23)	13.1 (26)	12.1 (4)	18.5 (53)
	No	58.2 (32)	86.9 (173)	87.9 (29)	81.5 (234)
	P-value	<0.001			
Asphyxia	Yes	50.9 (28)	8.0 (16)	24.2 (52)	18.1 (52)
	No	49.1 (27)	92.0 (183)	75.8 (235)	81.5 (235)
	P-value	<0.001			
Meconimum aspiration	Yes	0.0 (0)	12.1 (24)	0 (0)	8.4 (24)
	No	100 (55)	87.9 (175)	33 (100)	91.6 (263)
	P-value	0.003			
NICU	Yes	12.7 (7)	8.5 (17)	6.1 (2)	9.1 (26)
	No	87.3 (48)	91.5 (182)	93.9 (31)	90.9 (261)
	P-value	0.516			

Table IV: Parity-wise distribution of IUGR, Fetal distress, Macrosomia, Asphyxia, Meconium aspiration, and NICU

Parity-wise		Nulliparous % (n)	Multipara % (n)	Total % (n)
Fetal distress	Yes	0 (0)	20.9 (46)	16 (46)
	No	100 (67)	79.1 (174)	84 (241)
	P-value	<0.001		
Macrosomia	Yes	23.9 (16)	16.8 (37)	18.5 (53)
	No	76.1 (51)	83.2 (183)	81.5 (234)
	P-value	0.192		
Asphyxia	Yes	41.8 (28)	10.9 (24)	18.1 (52)
	No	58.2 (39)	89.1 (196)	81.9 (235)
	P-value	<0.001		
Meconium aspiration	Yes	0 (0)	10.9 (24)	8.4 (24)
	No	100 (67)	89.1 (196)	91.6 (263)
	P-value	0.005		
NICU	Yes	0 (0)	11.8 (26)	9.1 (26)
	No	100 (67)	88.2 (194)	90.9 (261)
	P-value	0.003		

Table V: Age-wise distribution of IUGR, Fetal distress, Macrosomia, Asphyxia, Meconium aspiration, and NICU

Age Groups		20-25.5 % (n)	> 25.5-29.9 % (n)	> 29.9-32 % (n)	Total % (n)
Fetal distress	Yes	10.4 (14)	23.7 (23)	16.1 (9)	16 (46)
	No	89.6 (120)	76.3 (74)	83.9 (47)	84 (241)
	P-value	0.025			
Macrosomia	Yes	17.9 (24)	20.6 (20)	16.1 (53)	18.5 (53)
	No	82.1 (110)	79.4 (77)	83.9 (234)	81.5 (234)
	P-value	0.764			
Asphyxia	Yes	18.7 (25)	13.4 (14)	25 (14)	18.1 (52)
	No	81.3 (109)	86.6 (42)	75 (42)	81.9 (235)
	P-value	0.195			
Meconium Aspiration	Yes	4.5 (6)	11.3 (11)	12.5 (7)	8.4 (24)
	No	95.5 (128)	88.7 (86)	87.5 (49)	91.6 (263)
	P-value	0.082			
NICU	Yes	9 (12)	9.3 (9)	8.9 (5)	9.1 (26)
	No	91 (122)	90.7 (88)	91.1 (51)	90.9 (261)
	P-value	0.956			

DISCUSSION

Post-term pregnancy is a complex situation for obstetricians and healthcare professionals owing to its inherent hazards to both the mother and the infant. A controversial discourse exists about the most effective approach to managing pregnancies that exceed the expected duration. The focal point of this discourse is the decision between conventional and selective induction accompanied by diligent fetal observation¹³⁻¹⁵. Research has been dedicated to investigating disparities in newborn morbidity between these two modes of treatment. However, the results consistently demonstrate that both techniques provide comparable outcomes^{16,17}.

Accurate determination of gestational age is crucial in effectively managing post-term pregnancies. The available literature indicates that the gestational age often occurs between 41+5 to 41+6 weeks in around 34% of cases, 41 to 41+4 weeks in about 35% of cases, and beyond 42 weeks in approximately 31% of cases¹⁸. The findings presented in this study are consistent with prior research conducted by Richard et al., who also observed comparable gestational age patterns¹⁹.

The prevalence of cesarean section procedures is significantly elevated among women with pregnancies that extend beyond the anticipated length. This observation aligns with previous research undertaken by Caughey et al., whereby the rate of spontaneous vaginal delivery was found to be 80% in the studied instances. When examining the data, it is evident that Caesarean section procedures constituted 12% of all births, whereas vacuum vaginal deliveries accounted for 8%^{20,21}. The post-term pregnancies are classified as high-risk²².

Caesarean sections in pregnancies that are beyond the expected gestational period often include fetal discomfort, birth asphyxia, and lack of development (23). Our research reveals that neonates experience birth asphyxia at a rate of 18.1%. Other studies, including Singal et al. and Heimstad et al., have reported similar results, emphasizing the need for thorough fetal monitoring in the 41-week category²⁴⁻²⁶. However, it is essential to acknowledge that our research's statistical data on birth asphyxia contradicts the conclusions drawn by Bagdady et al., who documented a reduced prevalence of APGAR scores below seven at the 5-minute mark²⁷.

Moreover, it seems that the incidence of maternal morbidity, such as a higher occurrence of caesarean sections, postpartum hemorrhage (PPH), perineal tear, sepsis, and cervical tear, is more prevalent among women in the 41-week group as compared to those in the 40-week group. While lacking statistical significance, these results align with the observations made by previous studies conducted by Paliulyte et al.²⁸, Caughey et al.²⁹ and Bishop et al.³⁰, which also revealed a greater prevalence of morbidities³¹. Further investigation is required to examine the comparative merits of induction of labor (IOL) and elective Caesarean section (ECS) in the context of protracted pregnancies. Additionally, there is a need to analyze clinical data obtained from real-world scenarios^{32,33}.

CONCLUSION

In summary, our research highlights fetal discomfort, macrosomia, and delivery asphyxia in pregnancies that extend beyond the expected length. Due to the constraints of our developing nation's infrastructure and resource availability, along with the significant volume of patients, it may not always be possible to implement comprehensive intrapartum surveillance. Moreover, the absence of knowledge and inadequate adherence of patients exacerbate the situation's complexity. Based on the characteristics, it is advisable to consider labor induction at 41 weeks as a viable approach to address the maternal and perinatal problems often associated with pregnancies that extend beyond the expected duration.

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AUTHOR'S CONTRIBUTION

Afridi Y: Idea, design, drafting, manuscript writing, final approval of manuscript

Jehangir R: Review, data collection, final approval of manuscript, Literature review, data collection, final approval of manuscript

Ullah I: Statistical analysis, editing of the manuscript, final approval of the manuscript, Literature review, data collection, final approval of manuscript

Robeen K: Review, data collection, final approval of manuscript, Data collection, data entry, drafting, final approval of manuscript

Muhammad A: Statistical analysis, editing of the manuscript, final approval of the manuscript, Data collection, data entry, drafting, final approval of manuscript

Khatak S: Idea, design, drafting, manuscript writing, final approval of manuscript

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