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Impact of Prolonged Pregnancy on Mode of Delivery and Fetal Outcome

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ABSTRACT

Background: The "term pregnancy" is defined as the pregnancy that ends between 259 and 294 days (37-42 weeks) of pregnancy from the 1st day of last menstrual period. If the pregnancy continues beyond this mentioned period, it is called prolonged pregnancy. Post-term Pregnancy is one of the commonest obstetric conditions which associated with an increased risk of fetal and neonatal mortality and morbidity as well as an increased maternal morbidity.

Objectives: The aim of this study is to determine the frequency of mode of delivery and fetal outcomes in prolonged pregnancy.

Material and Methods: It is a Descriptive cross sectional study, conducted from 28th Aug, 2019 to 28thFeb, 2020 at Department of Obs & Gynae, MTI-HMC Peshawar. Sample size was 125 keeping 11% proportion of patients having poor apgar score with 95% confidence interval, 5% level of significance.5% margin of error. Sample collection was accomplished by non-probability, consecutive sampling technique. All patients between 18-40 years of age with 42 weeks of gestation or more by dates or dating scan admitted to Gynae Ward/Labour room, having regular cycles were included in the study.

Results: As per descriptive statistics, mean and SDs for age was 25±4.90. Mean and SDs for gravidity was recorded as 2±0.58. Mean and SDs for parity was 2±0.58. Mean and SDs for Apgar score was recorded as 8±0.89. 28 (22.4%) patients were obese. In this study 14 (11.2%) neonates had poor apgar score. Normal vaginal delivery 66(52.8%) was the Frequent mode of delivery followed by assisted vaginal deliveries 48(38.4%) and Caesarean section11(8.8%).

Conclusion: In this study, we have concluded that pregnancy should not be allowed to go post-term due to association of higher neonatal morbidity and mortality rate, and should be managed before 42 weeks of gestation.

Keywords: Fetal outcome, Post term pregnancy, PoorApgar Score

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INTRODUCTION

The "term pregnancy" is defined as the pregnancy that ends between 259 and 294 days (37-42 weeks) of pregnancy from the 1st day of last menstrual period with the expected delivery date typically calculated at 40 weeks.[1] In late 2012, a collaborative effort among organizations like American college of obstetrician and Gynecologist (ACOG) and Society for Maternal-Fetal Medicine (SMFM) suggested replacing the terminology "term" with "early term," "fullterm,""late term," and "post term" to better describe deliveries occurring at or after 37 weeks.[2]

A post dated pregnancy is the one which extends to or beyond 40 weeks or 280 days from the first day of the L.M.P and has an incidence of 4% to 14%. A post-term or prolonged pregnancy is the one which extends to or beyond 42 weeks or 294 days from the first day of the L.M.P and has an incidence of 5% to 10%.[3]

The prevalence varies depending on population characteristics and local management practices. The incidence of Prolonged Pregnancy varies, depending on whether the calculation is based on the history and clinical examination alone, or whether early pregnancy ultrasound examination is used to estimate gestational age.The assessment of the gestational age by early ultrasound examination has reduced the "incidence" of Prolonged Pregnancy by 50.0%.[4]

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When menstrual dates are taken into account, the incidence of Prolonged pregnancies is 8.8%. When early ultrasound corroborates the menstrual dating, the incidence of Prolonged pregnancies falls to about 6.9%. The exact cause of post-term pregnancy is unclear and it may represent simple biological variation. The risk factors associated with post term pregnancy are primi-gravidity, maternal age, past history of post-term pregnancy, genetic predisposition, obesity, male fetus and hormonal factors.[5]

Although advancements in obstetric and neonatal care have reduced overall mortality rates, various studies reported heightened risks for both mothers and fetuses in pregnancies beyond term. Perinatal mortality, comprising stillbirths and neonatal deaths, escalates from 2 to 3 deaths per 1,000 deliveries at 40 weeks gestation to approximately double at 42 weeks and increases to 4 to 6 times greater by 44 weeks.[6] Post term pregnancy is associated with rise in maternal morbidity like higher rate of cesarean-section, cephalo-pelvic disproportion, shoulder dystocia, postpartum hemorrhage, cervical tears and perineal injuries. There is also greater hazard of fetal morbidity including increased count of oligohydromnios, meconium aspiration syndrome, fetal birth injuries, fetal distress, nonreassuring fetal heart rate, low Apgar scores in fifth minute of newborn, fetal macrosomia and septicemia.[7,8]

At 41 weeks gestation the perinatal mortality rate is high and it rises more with rising gestational age.[9] ACOG & RCOG recommends management of pregnancy at 41-42 weeks. Induction of labour is recommended at 41+ weeks and in those patients where expectant management is planned, monitoring should be done.[10,11]

It is imperative to explore the interplay between obstetric interventions, delivery outcomes, and neonatal health in these prolonged pregnancies. Previous studies unveiled many of the complexities surrounding this issue however a comprehensive investigation into the frequency of mode of delivery and its correlation with fetal morbidity in prolonged pregnancies remains an area ripe for further exploration. The aim of this study is to analyze different mode of delivery and fetal outcome in patients with prolonged pregnancy. By shedding light on these intricate relationships, our study aims to contribute valuable insight to help clinical decision-making, refine obstetric protocols or guidelines, and ultimately enhance the overall quality of care for both mothers and newborns in the context of prolonged pregnancy.

MATERIAL AND METHODS

This is a Descriptive cross sectional study conducted at OBG Department, Hayatabad Medical Complex; Peshawar from 31Aug, 2019 to 28 Feb, 2020.Sample size was 125 keeping 11%[12] proportion of patients having poor apgar score with 95% confidence interval, 5% level of significance.5% margin of error. Sample collection was accomplished by non-probability, consecutive sampling technique.

All patients between 18-40 years of age, having regular cycles with 42 weeks of gestation or more by dates or dating scan admitted during labour were included in the study. Patient with any gravidity i.e: Primigravida, multigravida and grand multigravida having Singleton pregnancy with vertex presentation were enrolled for this study after formal consent.

Patient with any other known co-existing risk factor like previous C-section or medical disorders, patients with congenital anomalies of fetus, chronic Hypertension, pre-eclampsia, eclampsia, heart disease, ante-partum hemorrhage, renal disease, multiple pregnancy, non vertex presentation determined on history taking and / or clinical examination and investigations were excluded from this study.
Following Operational definition are used;

Postdated and Post-term pregnancy (Prolonged pregnancy)
Any pregnancy that has passed beyond the estimated date of delivery is called a postdated pregnancy. However, when pregnancy is prolonged beyond 42 weeks, it is called post-maturity or post-term pregnancy.[20]

Period of gestation is calculated from a sure last menstrual period date (LMP) or an early scan of 9-18 weeks gestational age.5

Mode of delivery
The mode of delivery in obstetrics refers to the method by which a baby is born. Common modes include vaginal delivery and cesarean section, each chosen based on factors like maternal health, fetal well-being, and obstetrical considerations.[21]

Fetal outcomes
Fetal outcomes refer to the health and well-being of the unborn baby during and after pregnancy. These outcomes encompass various factors, including but not limited to birth weight, Apgar scores (a quick assessment of a newborn's physical condition), presence of congenital anomalies, and overall neonatal health.[20]

Poor Apgar score
It was assessed clinically immediately postnatal i.e within 1st minute of delivery, and after 5 minutes of delivery. Score of 7 and above is considered good Apgar score and score of 6 and below is considered as poor APGAR score.[22]

Approval from hospital ethical committee was obtained as per rule(Ref;IERB/1652/2022). All patients presenting to Gynae Labour room via OPD, Emergency or Private Clinics, meeting the inclusion criteria were included in the study.

Necessary history was obtained including age, parity,any comorbid, past medical or surgical history, previous obstetric history,mode of delivery and period of gestation calculated preferably from early scan of 9-18 weeks or sure LMP dates. Patient's progress of labour, mode of delivery, fetal outcome in terms of Apgar score at 1st and 5 min was recorded. C-Sections was carried out by consultant gynecologist having at least five years post fellowship experience whereas normal vaginal deliveries and assisted vaginal deliveries were carried out by post graduate residents under the supervision of the said consultant gynecologist.

All the data including age, gestational age, parity, gravidity, risk factors, mode of delivery and poor Apgar score was recorded in a pre designed proforma. Bias was controlled by strictly following exclusion criteria.
Data was entered in SPSS Version 22.0. Mean and SDs for numerical variables like age, gestational age, gravidity, parity and Apgar scores was calculated. Frequencies and percentages for categorical variables like risk factors, mode of delivery and poor Apgar score. Poor Apgar score was stratified with age, obesity, abnormal hormone factors, gravidity and parity in order to see effect modifiers. Post stratification chi square test was applied keeping P Value < 0.05 as significant. All results were presented in the shape of tables and graphs.

RESULTS

This study was carried out on 125 patients at the Department of Obs & Gynae, MTI-HMC Peshawar. Results are as follows:-

As per age wise distribution, 80 (64%) patients were recorded in 18-30 years age group and 45 (36%) patients were recorded in 31-40 years age group. As per descriptive statistics, mean and SDs for age was 25+4.90. Mean and SDs for gravidity was recorded as 2+0.58. Mean and SDs for parity was 2+0.58. Mean and SDs for Apgar score was recorded as 8+0.89. 28 (22.4%) patients were obese. Mode of delivery and Apgar score is shown in Table 01. Stratification of mode of delivery with respect to age, obesity, gravidity and parity are present at Table 02 and 03 respectively.

Table 01. Frequency and percentage of different variables

Variables	Frequency	Percentage (%)
Age group: ≤ 30 > 30	 80 45	 64 36
Total	**125**	**100**
Obesity: Yes No	 28 97	 22.4 77.6
Total	**125**	**100**
MoD NVD AVD C/S	 66 48 11	 52.8 38.4 8.8
Total	**125**	**100**
Poor Apgar Score Yes No	 14 111	 11.2 88.8
Total	**125**	**100**

Table 02. Stratification of mode of delivery with other variables

Variables		MoD	Frequency	Percentage (%)	PValue
Age group	≤ 30	AVD NVD C/S	35 39 06	28 31.2 4.8	0.00001
	> 30	AVD NVD C/S	13 27 05	10.4 4.0 21.6	
Obesity	Yes	AVD NVD C/S	07 17 04	5.6 3.2 13.6	0.00001
	No	AVD NVD C/S	41 49 07	32.8 39.2 5.6	
Gravidity	≤ 2	AVD NVD C/S	18 29 3	14.4 23.2 2.4	0.00001
	> 2	AVD NVD C/S	30 37 08	24.0 6.4 29.6	
Parity	≤ 2	AVD NVD C/S	46 62 10	36.8 49.6 8.0	0.791
	> 2	AVD NVD C/S	2 4 1	1.6 3.2 0.8	

Table 03. Stratification of apgar score with other variables

Variables		Poor Apgar Score	Frequency	Percentage (%)	Pvalue
Age group	≤ 30	Yes No	07 73	5.6 58.4	0.2468
	> 30	Yes No	07 38	5.6 30.4	
Obesity	Yes	Yes No	06 22	4.8 17.6	0.051
	No	Yes No	08 89	6.4 71.2	
Gravidity	≤ 2	Yes No	04 46	3.2 36.8	0.354
	< 2	Yes No	10 65	8.0 52	
Parity	≤ 2	Yes No	13 105	10.4 84.0	0.789
	< 2	Yes No	01 06	0.8 4.8	

DISCUSSION

Post term pregnancies are associated with higher risk of perinatal mortality and morbidity including meconium aspiration syndrome, asphyxia, respiratory distress syndrome, jaundice, and sepsis, Oligohydramnios, macrosomia, fetal birth injury, fetal distress and increased rate of caesarean section. In our study, 80 (64%) patients were recorded in 18-30 years age group and 45 (36%) patients were recorded in 31-40 years age group. A study carried out by Kortekaas et al, showed composite adverse perinatal outcome in 1.6% of women aged 18-34 years, 1.7% of women aged 35-39 years (RR 1.06, 95% CI 1.03-1.08, P < .001) and 2.2% of women aged =40 years (RR 1.38, 95% CI 1.29-1.47, P < .001).[13] A study carried out by Mohammed S.A also showed the majority of the case and control groups were (18-30 years) of age; (62.4% and 56.3% respectively).[14]

Although post term pregnancies are more common in nulliparous patients, majority of our patients 58.33% were multigravida. Similar findings were observed by Alrubaee MA where the majority of both groups were multiparous (1-4); (55.6%, 58%) respectively, with no significant difference. Primigravida with postdate pregnancy constitute (33.6 %) only.[15] The patients with previous history of post term pregnancy are at 2-3 fold increased risk of having post term pregnancy in subsequent pregnancy.

In our study, 48 (38.4%) patients were having assisted vaginal delivery, 66 (52.8%) patients were having normal vaginal delivery and 11 (8.8%) were having C Section.Similarly a study done by Ghumare JP et al showed total number of full term normal vaginal deliveries were 70% cases and caesarean section was 30%.[16] Another study done by kandalgaonkar VP? reported 46.9% women delivered vaginally and 16.7% required abdominal delivery. Post term pregnancy causes increased fetal morbidity and sometimes can lead to mortality. Fetal distress and asphyxia are more common due to poor placental reserves and reduced liquor volume. Meconium aspiration incidence increases, as a result of physiological passage of meconium occurs due to the maturation of parasympathetic system by 42 weeks of gestation. Meconium-stained liquor was a frequent neonatal complication of the postdate pregnancy in our study which is consistent with the observation done by Botcha H et al.[17]

In our study prolonged pregnancy was also found associated with an increase BMI and (22.4%) patients were obese. which is comparable to findings by Qazi et al[18] where 70.3% of women of BMI> 25 were within age groups of 18-34 years.

Post term pregnancy is associated with rise in maternal morbidity like higher rate of cesarean-section, cephalo-pelvic disproportion, shoulder dystocia, postpartum hemorrhage, cervical tears and perineal injuries. In another study, among 150 patients 135 (90%) were induced, 114 (76%) patients had spontaneous vaginal delivery, 14 (9%) patients had vacuum vaginal delivery and 22 (15%) patients had caesarean section. In same study 134 (89%) babies had Apgar score>7 and 16 (11%) babies had Apgar score <7.[12] In our study, as per frequencies and percentages for poor Apgar score, 14 (11.2%) infants had poor Apgar score. Out of the 90 infants, when Apgar score was less than 7, only 42 of them were admitted to the NICU.[19]

Our study, along with numerous others, has concluded that the likelihood of maternal and neonatal morbidity rises as pregnancy extends beyond 40 weeks. Although the definition of post-term pregnancyexceeds

42 weeks from LMP, the pregnancy and delivery complications increase once it crosses 40 weeks. The outcome of prolonged pregnancy can be improved by proper counselling for follow up during pregnancy and proper monitoring and appropriate management during labor.

Management of prolonged pregnancy in the absence of other complications is controversial. There is debate among obstetricians on elective induction of labour versus expectant management of the post term patients. Prevention of post term pregnancy may include stripping or sweeping the membranes and unprotected coitus. In any case close fetomaternal monitoring avoids complications. Individual patient management should involve careful counseling regarding the risks and benefits of each of the components of care.

Notably, our study's strength lies in its exclusion of high-risk pregnancies, which could have otherwise skewed the results. However, limitation of the study include small sample size and the relatively brief follow-up duration.

CONCLUSION

In this study, we have concluded that pregnancy should not be allowed to go post-term due to association of higher neonatal morbidity and mortality and should be managed before 42 weeks of gestation.

Recommendations

Assessing fetal well-being and implementing appropriate management are crucial steps to reduce maternal and neonatal morbidity and mortality associated with post-term pregnancies. Regular antenatal care can decrease the occurrence of post-term pregnancies by utilizing a documented last menstrual period and early pregnancy ultrasound.

Ethical Consideration

This study was approved by the ethical board of Hayatabad Medical Complex, Peshawar, Pakistan.

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Conflict of Interest

Authors declared no conflict of interest

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DATA SHARING STATEMENT: The data that support the findings of this study are available on request from the corresponding author. The data is not publicly available due to privacy or ethical restrictions.

AUTHORS' CONTRIBUTION

The following authors fullfill authorship criteria as per ICMJE guidelines;

Rehman F, Kishwar N:	Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Karim R:	Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.
Khattak S:	Analysis and interpretation of data, drafting the manuscript, final approval, agreed to be accountable for all the work.
Mudassir S:	Analysis and interpretation of data, critical revision,final approval, agreed to be accountable for all the work.

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