Title: To examine the outcomes of induction of labour in post term pregnancy presenting at a tertiary care hospital

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Abstract:

Objective: To investigate the effects of inducing labor in women with post-term pregnancy

Method: Retrospective analysis of obstetric data from a cohort of women who gave birth is part of the project. Age groups, gravidity, parity, and other participant demographics are gathered and sorted. Birth outcomes are documented, including instrumental delivery, vaginal birth, rates of caesarean sections, and newborn problems. The relationships between demographic factors and birth outcomes are evaluated using statistical methods such as logistic regression and chi-square testing.
Result: Vaginal deliveries account for 66% of all deliveries. Compared to younger age groups, older age groups had higher incidence of caesarean sections and birth asphyxia . Higher gravidity and parity were also linked to higher incidence of caesarean sections and low APGAR scores .
Conclusion: Personalized care plans are essential for improving the health of new mothers and babies, especially when they are vaginal birth after cesarean cases. The results highlight the necessity of customized risk assessment and management strategies to improve maternal and newborn health outcomes and birth outcomes.
Key words: normal vaginal delivery, c-sec, instrumental delivery, age, gravida, parity.

Introduction:

One typical obstetric procedure used to prevent difficulties from extended gestations is induction of labor, especially in cases where the pregnancy is longer than 41 weeks. By shedding light on the relationships between these factors and pregnancy outcomes, our findings hope to improve care for both the mother and the baby in post-term pregnancies and to guide professional judgment. A miscarriage that is more than 40 weeks gestation is referred to as a postdate pregnancy. Any pregnancy lasting more than 294 days gestational is considered post-term according to the International Federation of Gynecology and Obstetrics (FIGO) and the World Health Organization (WHO). In order to determine the prevalence of different delivery procedures and newborn complications in women undergoing labor induction beyond 41 weeks of gestation, we look at demographic parameters such as age, gravidity, and parity. Despite being widely used, a thorough investigation into the frequency of typical pregnancy outcomes among women having induction at or above this gestational age barrier is still necessary. Pregnancy prolongation is a condition that affects around 10% of pregnancies and is extremely dangerous for the fetus as well as the mother[1-2]. The diagnosis of post-dated pregnancy and the treatment that follows depend heavily on the gestational age. The LMP is the main method used to date gestational age; Naegle's rule, which states that 14% of pregnancies end in labor at or beyond 42 weeks, is a supplement. The assessed studies consistently show that post-term pregnancies have a higher rate of perinatal death than term pregnancies. A high risk condition, prolonged pregnancy is generally identified due to the reported rise in perinatal morbidity and mortality[3-4]. Pregnancy that develops after the anticipated due date is linked to a higher risk of stillbirth and infant death. Reduced amniotic fluid levels are more likely to develop at or after 41 weeks of gestation. Meconium transit in amniotic fluid has been linked to an increase in postdate pregnancy instances; rates have been found to range from 12% to as high as 30–40%. Meconium aspiration syndrome (MAS) is associated with higher risks of fetal morbidity and death and lower Apgar scores[5-7]. Fetal macrosomia is a known condition that can develop from pregnancies that are later than expected. This condition may lead to increased risks for both the mother and the fetus, including perinatal hypoxia, meconium aspiration, shoulder dystocia, and postpartum hemorrhage. While some studies have found an increased risk beginning at 40 weeks of gestation, others have found an increased rate of stillbirth after 41 weeks of gestation[8-10].The goal of the study is to determine the outcomes of induction of labour in late term pregnancies in order to identify patients at risk of complications and failed inductions to better formulate mangement plans in such patients in this part of country.

Material and methods:

This retrospective cohort study was carried out at Hayatabad Medial Complex Hospital, Peshawar, Pakistan, from 1st January 2020 to 31st December 2020. Obstetrical and neonatal data was collected from the hospital's computerized medical records system through non probability convenience sampling technique. Patients of all age groups and parity presenting with single pregnancy and age of gestation 41weeks or above who underwent induction of labour were included in the study . However patients with gestational age <41 week and those with >41week but underwent spontaneous labour or planned and emergency C/section for any reason were excluded.. Data was analyzed through SPSS version 25

In descriptive analysis, percentage and frequency was calculated for categorical variables and mean ±standard deviation or median for all the continuous variables.

Outcomes of induction of labour were defined as ; normal vaginal delivery, instrumental delivery, Cesarean section, birth asphyxia, meconium stained amniotic fluid and Post partum heamorhage In univariable analysis, chi- square test was applied to look for association of the outcomes of Labour with the subsequent factors i-e: Maternal age , gravidity parity and Macrosomic babies . The confidence interval of 95% and p value of $\leq$ 0.05 was considered statistically significant. At multivariate analysis, we applied logistic regression to check the odd ratio of significant variables.

Results:

A total of 292 patient with late term pregnancy underwent induction of labour .The distribution of age categories among participants were as follows: 63 (21.6%) were in the 17–25 age(low age group) range, 94 (32.3%) were in the 25–35 age (moderate age group)range, and 135 (46%) were in the 35–42 age range(high age group). According to the gravidy distribution, 98 women (33.6%) had a high gravidy of 4–7, while 194 participants (66.4%) had a low gravidy of 1-4. In terms of parity, 85 (29.1%) women had a high parity of 3-5, whereas 207 (70.9%) participants had a low parity of 0-3.Table No 1

According to the findings, 192 participants (65.6%) delivered their babies naturally by vaginal birth, 42 (14.4%) had an intrumental delivery, and 58 (19.19%) had filed induction leading to cesarean section. Furthermore, among the cases, there were 55 (18.8%) newborns had birth asphyxia, 40 (13.7%) were macrosomic, while 25 (8.6%) had meconium stained amniotic fluid, and 29 (9.9%) developed postpartum hemorrhage.Table No 2

By using Chi-square test we found that among the different age groups rate of C-sec(P=0.001) , birth asphyxia in neonates and PPH(P=0.001) was higher in lower maternal age group while Instrument delivery(0.001) was significantly observed in higher age group .Nonetheless, there was no discernible difference in typical vaginal delivery between age groups (p = 0.99), Table No 3. In terms of gravidity we found NVD, birth asphyxia and meconium stained amniotic fluid was significantly correlated ((P=0.001) with low gravidity while C/Sec and PPH was associted with higher parity. In case of parity we noticed that only PPH, birth asphyxia and meconium stained amniotic fluid was significantly associated (P=0.001)with low parity Table No 4

Table: 1 variable with details

variables		frequencies	percentages
Age groups	17-25	63	21.6%
	25-25	94	32.3%
	35-42	135	46%
gravidy	1-4	194	66.4%
	4-7	98	33.6%
parity	0-3	207	70.9%
	3-5	85	29.1%

Table: 2 outcome variables

outcome	yes	no
Normal vaginal delivery	192(65.6%)	100(34.2%)
Instrumental delivery	42(14.4%)	250(85,6%)
c.sec	58(19.19%)	234(80.1%)
Birth asphyxia	55(18.8%)	237(81.2%)
Macrosomia	40(13.7%)	253(86.3%)
Meconium aspiration	25(8.6%)	267(9.4%)
pph	29(9.9%)	263(90.1%)

Table: 3 age group with outcomes variables

outcome	Age 17-25		Age 25-35		Age 35-42		p-value
	yes	no	yes	no	yes	no	
Normal vaginal delivery	36(57.1%)	27(42.9%)	69(73.4%)	25(26.6%)	87(64.4%)	48(35.6%)	0.99
Instrumental delivery	0(0%)	63(100%)	12(12.8%)	82(87.2%)	30(22.2%)	105(77.8%)	0.001
c-sec	27(42.9%)	36(57.1%)	13(13.8%)	81(86.2%)	18(13.3%)	117(86.7%)	0.001
birthasphyxia	28(44.4%)	35(55.6%)	0(0%)	94(100%)	27(20%)	108(80%)	0.001
macrosomia	27(42.9%)	36(57.1%)	0(0%)	94(100%)	13(9.6%)	122(90.4%)	0.001
Meconium aspiration	0(0%)	63(199%)	12(12.81%)	82(87.2%)	13(9.6%)	122(90.4%)	0.016
pph	11(17.5%)	52(82.5%)	0(0%)	94(100%)	18(13.3%)	117(86.7%)	0.001

Table: 4 outcomes related to gravidy and parity

outcome	gravidy				p-value	parity				p-value
	1-4		4-7			0-3		3-5		
	yes	no	yes	no		yes	no	yes	no	
Normal vaginal delivery	142(73.2%)	52(26.8%)	50(51%)	48(49%)	0.001	142(68.6%)	65(31.4%)	50(58.8%)	35(41.2%)	0.110
Instrumental delivery	25(12.9%)	169(87.1%)	17(17.3%)	81(82.7%)	0.305	25(12.1%)	182(87.9%)	17(20%)	68(78.8%)	0.800
c-sec	27(13.9%)	167(86.1%)	31(31.6%)	67(68.4%)	0.001	40(19.3%)	167(80.7%)	18(21.2%)	67(78.8%)	0.718

Birth asphyxia	55(28.4%)	139(71.6%)	0(0%)	98(100%)	0.001	55(26.6%)	152(73.4%)	0(0%)	85(100%)	0.001
Macrosomia	40(30.6%)	154(79.4%)	0(0%)	98(100%)	0.001	40(19.3%)	167(80.7%)	0(0%)	85(100%)	0.001
Meconium aspiration syndrome	25(12.9%)	169(87.1%)	0(0%)	98(100%)	0.001	25(12.1%)	182(87.9%)	0(0%)	85(100%)	0.001
pph	11(5.7%)	183(94.3%)	18(18.4%)	80(81.6%)	0.001	11(87.9%)	169(94%)	18(21.2%)	67(78.8%)	0.001

Discussion:

Our study provides important insights into this therapeutically important technique by examining the prevalence of common pregnancy outcomes among women who undergo labor induction at or beyond 41 weeks of gestation. Our results show a number of interesting trends that are worth mentioning. First, there are differences in the distribution of results according to demographic variables including parity, age, and gravidity. It's interesting to note that although age appears to have an impact on outcomes like instrumental delivery, cesarean section, and newborn problems, it has little effect on the percentage of vaginal deliveries that occur normally. This implies that factors other than maternal age that affect delivery style and newborn health outcomes interact in a complex way. Moreover, there are noteworthy correlations between gravidity and parity and outcomes such macrosomia, birth asphyxia, and cesarean section; these findings emphasize the significance of taking obstetric history into account when evaluating pregnancy outcomes in this population. The absence of substantial connections between gravidity or parity with instrumental delivery or a normal vaginal delivery, despite these relationships, highlights the multifaceted nature of delivery mode determination. It is critical to acknowledge the advantages and disadvantages of our research.With an emphasis on the complex dynamics of labor, the study investigates the association between a number of obstetric and demographic factors and birth outcomes. The ideal timing to deliver is a topic of discussion, and several studies are looking into this. Studies reveal that elective induction performed prior to 39 weeks of pregnancy is associated with an elevated likelihood of neonatal intensive care unit admissions, prolonged hospital stays for the newborn, a high rate

of readmission within the first two weeks following delivery, and a rise in emergency room visits[11-12]. participant demographics are shown in Table 1, with a significant percentage of participants in the 25–35 age range, gravidities ranging from 1 to 4, and parities ranging from 0 to 3. Birth outcomes are shown in Table 2, with the majority of deliveries occurring vaginally (65.6%), followed by instrumental deliveries (14.4%) and caesarean sections (19.19%). Elective induction at 39 weeks reduced the rate of caesarean sections, pregnancy hypertension, perinatal infection, and neonatal adverse perinatal outcomes (respiratory complications, NICU admission, perinatal death), but it had no effect on the early literacy and numeracy abilities of the newborns, according to a large multicenter RCT and some retrospective studies. A worldwide cohort study revealed that the risk of PPH rose with gestational age beyond 39 weeks[13-14]. Various rates of neonatal problems, including birth hypoxia, macrosomia, and meconium aspiration, have also been reported. Table 3 explores results related to age groups and shows statistically significant relationships between age groups and delivery procedures in addition to neonatal problems. For example, compared to younger age groups, older age groups had higher incidence of caesarean sections and birth asphyxia. In a similar vein, Table 4 examines results related to gravidity and parity and finds strong associations with delivery techniques and infant problems. Research has uncovered a number of macrosomia risk factors, including hypoglycemia, meconium aspiration, respiratory difficulties, clavicle fractures, shoulder dystocia, and reduced 5-minute Apgar scores[15]. Due to the correlation between higher gravidity and parity and higher incidence of caesarean sections and neonatal problems, obstetric history has a significant influence on birth outcomes. The study emphasizes how crucial it is to take into account a variety of obstetric and demographic aspects when making decisions about birthing. Optimizing maternal and newborn health outcomes requires tailored management techniques, especially when it comes to vaginal birth following caesarean section. It is necessary to conduct more study to examine other factors and interventions targeted at boosting maternal and newborn care and improving birth outcome. Comprehensive follow-up longitudinal studies and interventional trials may offer deeper insights into how to best support expectant moms and their babies. Policy and decision-making in the healthcare sector may benefit from the application of health economic analysis. Despite these drawbacks, the research contributes significantly to the field and lays the groundwork for future advancements in the treatment of post-term pregnancies undergoing induction of labor. the substantial sample size and meticulous statistical analysis of the study enhance the validity and reliability of our findings. However, inherent shortcomings such as the retrospective design and single-center setup may introduce biases and limit generalizability. Accounting for possible confounders and missing data is still a challenge. Looking ahead, the suggested multicenter collaborations could facilitate a deeper exploration of this topic, which could aid future research.

In addition, the detailed examination of age groups and their outcomes—which include higher incidence of birth hypoxia and caesarean sections in older age groups—provides valuable data for customized care strategies. The emphasis on the value of individualized risk assessment and management strategies is one important lesson that could direct clinically practices to improve mother and newborn health outcomes. One of its primary benefits is the large sample size, which boosts the conclusions' statistical power and reliability. The use of logistic regression and chi-square testing to evaluate the correlations between factors such as age, gravidity, parity, and delivery procedures offers a strong methodological approach.

Although hospital records are a significant source of data, using them alone presents the risk of incomplete or inaccurate records. Additionally, certain confounding variables that can affect the results—like socioeconomic position, lifestyle choices, and access to healthcare—are not taken into consideration in this study. The results should be interpreted cautiously because causality cannot be conclusively established in the absence of a prospective design. Additionally, the study shows a strong correlation between obstetric history (gravidity and parity) and unfavorable outcomes including macrosomia and delivery hypoxia; however, it does not go into great detail about possible measures to lessen these
Multicenter partnerships would improve the data' generalizability and offer a more thorough understanding of the connections between obstetric and demographic factors and delivery outcomes. It would be helpful to do prospective, longitudinal studies to track long-term consequences for mothers and infants as well as to determine causality. Interventional trials may also be planned to evaluate particular management approaches intended to lower newborn problems and increase VBAC success rates. Incorporating health economic studies could help with policy development and decision-making in healthcare settings by offering insights into the cost-effectiveness of various obstetric management techniques. In summary, although this work contributes significantly to the profession, more research is obviously needed to optimize care for mothers and newborns and enhance delivery outcomes.

Conclusion: In particular, the study's findings on the success rates of vaginal birth after caesarean sections (VBACs) shed important light on the relationships between obstetric and demographic characteristics and delivery outcomes. The results highlight the significance of customized management approaches to improve the health of expectant mothers and newborns, particularly when making a VBAC decision. Age groups, gravidity, parity, and delivery outcomes have been shown to significantly correlate, which highlights the necessity for tailored risk assessment and management techniques during childbirth.

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