Research Article

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Factors associated with successful vaginal delivery after prior Cesarean section.

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ABSTRACT

Objective: to examine the correlations between obstetric and demographic variables and the results of delivery, with a particular emphasis on the success rates of vaginal birth after caesarean sections. Examining age groups, gravidity, parity, and their associations with delivery techniques and infant problems are some of the specific goals.

Method: Retrospective analysis of obstetric data from a cohort of women who gave delivery 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: The demographics of the participants are shown in Table 1, which includes significant percentages in the 25–35 age range, with gravidities ranging from 1 to 4 and parities from 0 to 3. Table 2 lists the results of births; vaginal deliveries account for 65.6% of all deliveries. Compared to younger age groups, older age groups had higher incidence of birth hypoxia and caesarean sections. As shown in Table 4, higher gravidity and parity are also linked to higher incidence of caesarean sections and newborn problems.

Conclusion: Personalized care plans are essential for improving the health of new mothers and babies, especially when they are VBAC cases. The results highlight the necessity of customized risk assessment and management strategies to improve maternal and newborn health outcomes and birth outcomes.

Keywords: *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. In this study, we examine demographic factors including age, gravidity, and parity to find out how common various delivery methods are, as well as neonatal issues, in women who are having labor induction after 41 weeks of gestation. 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. Despite its widespread application, a complete comprehension of the frequency of common pregnancy outcomes among women receiving induction at or above this gestational age threshold is still necessary

A postdate pregnancy is defined as one that is greater than 40 weeks gestation. The International Federation of Gynecology and Obstetrics (FIGO) and the World Health Organization (WHO) both classify any pregnancy lasting longer than 294 days gestational as post-term.

Pregnancy prolongation is a condition that affects around 10% of pregnancies and is extremely dangerous for the fetus as well

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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. The user has specified a range of numbers, precisely[8-10].

METHODOLOGY

This retrospective cohort study was carried out at hayatabad medial complex Hospital in Peshawar, Pakistan, from January 2020 to December 2020. the goal of the study was to examine the relationship between demographic and obstetric characteristics and birth outcomes, with a specific emphasis on the success rates of vaginal delivery after caesarean sections. Obstetric data, such as information on mother age, gravidity, parity, delivery methods, and neonatal issues, were stored in the hospital's computerized medical records system. We will determine the sample size based on the expected percentage of typical pregnancy outcomes, the necessary degree of confidence (e.g., 95%), and an acceptable margin of error in order to guarantee the statistical power of our study. We will calculate the sample size needed to accurately and sufficiently identify significant differences in results using a proportions method. The study's inclusive criteria will encompass women who are undergoing induction of labor and have a singleton pregnancy at or above 41 weeks of gestation. This criterion makes sure that the post-term pregnancies receiving the intervention of interest are a homogeneous group on whom our study is concentrated. following cases will not be included in the analysis: pregnancies complicated by known fetal anomalies or intrauterine growth restriction; multiple pregnancies; women who are contraindicated for labor induction; women who have previously had a cesarean section and choose to have one again electively; and cases involving gestational age below 41The weeks. Descriptive statistics will be used in our statistical analysis plan to provide an overview of the study population's features and the frequency of typical pregnancy outcomes. For categorical variables, we will compute proportions; for continuous variables, we will compute means with standard deviations. We will employ suitable statistical methods, such as t-tests or Mann-Whitney U tests for continuous variables and chi-square tests or Fisher's exact tests for categorical variables, to compare pregnancy outcomes between groups. Logistic regression analysis will be used to adjust for potential confounding factors. To investigate possible effect modification, subgroup analyses based on maternal age, parity, and indication for induction will be carried out. Sensitivity analysis, which change the inclusion/exclusion criteria or statistical techniques, will evaluate how robust our findings are. Sensitivity analysis and multiple imputation are two relevant methods that will be used to address missing data. 0.05 $\alpha = 0.05$ will be the significance criterion for hypothesis testing. Applications like R, SPSS, or SAS will be used for all statistical studies. Anonymization of the data was done to protect patient privacy. Serving a sizable population in the area, Hayatabad medical complex is a tertiary care facility situated in Peshawar, Pakistan's Khyber Pakhtunkhwa province. Modern amenities and specialized obstetric services make Hayatabad medical complex well-known destination for maternity and newborn care. The study obtained obstetric data from January 2020 to December 2020 by using the hospital's electronic medical records system. The obstetric department of the hospital is open around-the-clock, offering comprehensive treatment to expectant mothers and handling issues linked to childbirth. Prior to starting the trial, ethical approval dated 9 may 2018, ref no 28/ireb/hmc was taken from the institute.

RESULTS

The distribution of age categories among participants in the demographic data (**Table 1**) was as follows: 63 (21.6%) were in the 17–25 age range, 94 (32.3%) were in the 25–35 age range, and 135 (46%) were in the 35–42 age range. According to the gravidy distribution, 98 people (33.6%) had a gravidy of 4–7, while 194 participants (66.4%) had a gravidy of 1-4. In terms of parity, 85 (29.1%) people had a parity of 3-5, whereas 207 (70.9%) participants had a parity of 0-3.

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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%

For every outcome, the frequencies and percentages were given in **Table 2**, which shows the outcome variables. According to the findings, 192 participants (65.6%) delivered their babies naturally by vaginal birth, 42 (14.4%) used an instrument, and 58 (19.19%) had a cesarean section. Furthermore, among the cases, there were 55 (18.8%) that had birth asphyxia, 40 (13.7%) that had macrosomia, 25 (8.6%) that had meconium aspiration syndrome, and 29 (9.9%) that had postpartum hemorrhage.

Table 2. outcome variable.

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%)

Age and a number of outcome factors showed significant relationships, according to further analysis (**Table 3**) based on age groupings. For example, there were notable variations across age groups in assisted delivery, cesarean section, birth hypoxia, macrosomia, meconium aspiration syndrome, and postpartum hemorrhage ($p < 0.05$). Nonetheless, there was no discernible difference in typical vaginal delivery between age groups ($p = 0.99$).

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

The results pertaining to parity and gravidy were examined in **Table 4**. Gravidy was found to be significantly correlated ($p < 0.05$) with outcomes such macrosomia, delivery asphyxia, cesarean section, meconium aspiration syndrome, and postpartum hemorrhage. Parity also had a significant correlation ($p < 0.05$) with delivery hypoxia, macrosomia, meconium aspiration syndrome, cesarean section, and postpartum hemorrhage. Nevertheless, there was no discernible correlation ($p > 0.05$) seen between gravidy or parity with either a vaginal or an instrumental birth.

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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. Several noteworthy and intriguing trends are revealed by our results. Firstly, variations exist in the outcome distribution based on demographic factors such as age, gravidity, and parity. The percentage of vaginal deliveries that go smoothly appears to be unaffected by age, which is interesting because age does seem to affect outcomes like instrumental delivery, cesarean section, and neonatal problems. there are no significant correlations between gravidity or parity and an instrumental birth or a typical vaginal delivery, which emphasizes how challenging it is to select the optimal delivery mode. This suggests that factors other than the mother's age could affect the intricate connection between the newborn's health and the manner of birth. Furthermore, there are notable associations between outcomes including macrosomia, birth asphyxia, and cesarean section with gravidity and parity; these data highlight the importance of considering obstetric history when assessing pregnancy outcomes in this population. 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. Furthermore, the study's large sample size and careful statistical analysis improve the validity and trustworthiness of our conclusions. 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. 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. significantly to the field and lays the groundwork for future advancements in the treatment of post-term pregnancies undergoing induction of labor.

CONCLUSION

The findings emphasize the value of tailored management strategies to enhance the health of expectant mothers and their babies, especially when deciding whether to have a vaginal birth canal. Research has demonstrated a substantial correlation between age groups, gravidity, parity, and delivery outcomes. This underscores the need for customized risk assessment and management strategies during childbirth. The study provides significant insight into the connections between obstetric and demographic factors and delivery outcomes, particularly with regard to the success rates of vaginal births after cesarean sections, or VBACs.

REFERENCES

1. Coates D, Homer C, Wilson A, Deady L, Mason E, Foureur M, Henry A. Induction of labour indications and timing: A systematic analysis of clinical guidelines. Women and Birth. 2020 May 1;33(3):219-30.

2. Dagli S, Fonseca M. To study the maternal and neonatal outcome in postdated women undergoing induction of labour versus spontaneous labour. The Journal of Obstetrics and Gynecology of India. 2021 Apr;71:131-5.

3. Keulen JK, Bruinsma A, Kortekaas JC, Van Dillen J, Bossuyt PM, Oudijk MA, Duijnhoven RG, Van Kaam AH, Vandenbussche FP, Van Der Post JA, Mol BW. Induction of labour at 41 weeks versus expectant management until 42 weeks (INDEX): multicentre, randomised non-inferiority trial. bmj. 2019 Feb 20;364.

4. Grobman WA, Rice MM, Reddy UM, Tita AT, Silver RM, Mallett G, Hill K, Thom EA, El-Sayed YY, Perez-Delboy A, Rouse DJ. Labor induction versus expectant management in low-risk nulliparous women. New England Journal of Medicine. 2018 Aug 9;379(6):513-23.

5. Liu CH, Yang ST, Wang PH. Maternal factors associated with fetal macrosomia. Journal of the Chinese Medical Association. 2023 May 1;86(5):455-6.

6. Beta J, Khan N, Fiolna M, et al. Maternal and neonatal complications of fetal macrosomia: cohort study. Ultrasound Obstet Gynecol. 2019;54:319–25.

7. Turkmen S, Johansson S, Dahmoun M. Foetal macrosomia and foetal-maternal outcomes at birth. J Pregnancy. 2018;2018:4790136.

8. Salihu HM, Dongarwar D, King LM, et al. Phenotypes of fetal macrosomia and risk of stillbirth among term deliveries over the previous four decades. Birth. 2020;47:202–10.

9. Jha S. Episiotomy: necessity or negligence?. BJOG: An International Journal of Obstetrics & Gynaecology. 2020 Oct;127(11):1408-.

10. Leduc D, Senikas V, Lalonde AB. No. 235-active management of the third stage of labour: prevention and treatment of postpartum hemorrhage. J Obstet Gynaecol Can. 2018;40:e841–55.

11. Yisma E, Mol BW, Lynch JW, et al. Elective labor induction vs expectant management of pregnant women at term and children's educational outcomes at 8 years of age. Ultrasound Obstet Gynecol. 2021;58:99–104.

12. Butwick AJ, Liu C, Guo N, et al. Association of gestational age with postpartum hemorrhage: an international cohort study. Anesthesiology. 2021;134:874–86.

13. ACOG Committee on Obstetric Practice. ACOG practice bulletin no. 190: gestational diabetes mellitus. Obstetrics & Gynecology. 2018;131(2):e49-64.

14. Cavoretto PI, Seidenari A, Amodeo S, et al. Quantification of posterior risk related to intrapartum FIGO 2015 criteria for cardiotocography in the second stage of labor. Fetal Diagn Ther. 2021;48:149–57.

15. Cavoretto PI, Seidenari A, Farina A. Hazard and cumulative incidence of umbilical cord metabolic acidemia at birth in fetuses experiencing the second stage of labor and pathologic intrapartum fetal heart rate requiring expedited delivery. Arch Gynecol Obstet. 2023;307:1225–32.