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## **Comparison of neonatal outcome of elective cesarean section done at 37–38 weeks of gestation and at 39–40 weeks of gestation**

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**Abstract**---Objective: The study aimed to compare the CS between 37 and 38 weeks gestational weeks and those performed between 39–40 weeks gestational weeks in order to determine the neonatal outcome and complications. Study design: comparative cross-sectional. Place and Duration of study: The study was conducted on 200 pregnant women in the Department of Obstetrics and Gynecology, Baqai Medical University, Fatima Hospital, Gadap Karachi from January 2021 to December 2022. Methodology: Women with term singleton pregnancies scheduled for elective cesarean section at 37 - 38 weeks and 39–40 weeks of gestation without medical comorbidities were enrolled.. All the patients were distributed into two groups: Group-A composed of pregnant women with gestational age 37–38 weeks and Group-B pregnant women with gestational age of 39–40 weeks. Data such as maternal age, gestational age, parity, and neonatal complication neonatal weight were collected. Transient tachypnea of the newborn (TTN), sepsis, NICU admission, respiratory distress

syndrome (RDS), and neonatal outcomes were noted. Repeat C-Section, malpresentation, Cephalopelvic Disproportionation (CPD), maternal request were different causes for elective cesarean section. Data was collected from those patients who were admitted in ward for elective cesarean section through a pre designed proforma. Data analysis was done in SPSS version 27. Results: Of the total 200, pregnant women who delivered 37-38 (Group-A) and 39-40 gestational weeks (Group-B) were 96 (48%) and 104 (52%) respectively. The incidence of various causes or indications of cesarean sections such as repeat C-Section, malpresentation, Cephalopelvic Disproportionation (CPD), maternal request, and others were 45 (46.9%) vs. 38 (36.5%), 13 (13.5%) vs. 16 (15.4%), 15 (15.6%) vs. 7 (6.7%), 12 (12.5%) vs 13 (12.5%), and 5 (5.2%) vs. 0 (0%) respectively. The incidence of perinatal outcomes such as NICU admission, respiratory distress syndrome (RDS), sepsis, and Transient tachypnea of the newborn (TTN) in group-A vs. group-B were 49 (51%) vs. 59 (56.7%), 55 (57.3%) vs. 17 (16.3%), 16 (16.7%) vs. 9 (8.7%), 35 (36.5%) vs. 9 (8.7%), and 16 (16.7%) vs. 1 (0.9%) respectively. The mean age of women who delivered in 37-38 pregnant weeks was  $26.82 \pm 6.32$  years, which was substantially older than women who gave birth at 39-40 gestational weeks ( $26.3 \pm 5.83$  years) ( $P = 0.039$ ). Conclusion: The study proved that without any specific indication for elective cesarean section done at 39-40 weeks to improve neonatal outcome rather at 37-38 weeks give rise unexpected NICU admissions

**Keywords**--neonatal outcome, transient tachypnea of newborn, respiratory distress syndrome, repeat C-section, elective, cesarean section.

## Introduction

Cesarean section (CS) is a frequent procedure, and its prevalence has increased over the previous two decades [1]. The CS rate has risen from 20% to 42% in South America and from 14% to 25% in Europe [2]. The CS rate in South Asian nations, including Pakistan, has risen from 3.2% in 1990 to 20% in 2018 [3]. After CS, adverse health outcomes and problems for mothers and their newborns are extensively established. In light of the perinatal scenario, an acceptable gestational age for CS is required. The gestational age for elective caesarean section, on the other hand, is continually changing [4]. A previous study reported that elective caesarean delivery is associated with a two to almost seven-fold increase in the risk of respiratory morbidities as compared to vaginal birth. Transient Tachypnea of the Newborn (TTN), respiratory distress syndrome (RDS), and Neonatal Intensive Care Unit (NICU) admission in near term infants are examples of these [5]. After a caesarean section before 39 weeks gestation, the risk of respiratory morbidity was dramatically increased [6].

Betrán et al. discovered that the respiratory problems (RDS or TTN) risk reduced from 5.5 to 3.4% between 37 and 38 weeks [7]. Several publications have confirmed this link, whether in terms of total newborn respiratory morbidity or

specific neonatal respiratory morbidity [8, 9]. The effectiveness of corticosteroid therapy in lowering the frequency of respiratory distress in premature infants born before 34 weeks and even 37 weeks was proven some time ago [10, 11]. Obstetricians and pediatricians have assumed fetal maturity at 37 weeks for the past four decades. Yet, it has become obvious that increasing the gestational age to 39 weeks reduces neonatal respiratory morbidity and other poor health outcomes [12]. Based on NICE and RCOG recommendations, pregnant women should not go through elective caesarean section before of 39 gestation weeks [13]. Similarly, Chang et al. reported that before an elective caesarean section, giving corticosteroids could reduce the frequency of respiratory distress in NICU admission from 5.0% to 2.4%, mostly by lowering the rates of TTN and RDS [14]. Nevertheless, their study investigated the caesarean sections performed between 37 and 42 weeks. Therefore, the present study aimed to compare the CS between 37- and 38-weeks gestational weeks and those performed at 39-40 weeks gestational weeks in order to determine the neonatal outcome and complications.

## **Methodology**

This comparative cross-sectional study was conducted on 200 pregnant women in the Department of Obstetrics and Gynecology, Baqai Medical University, Fatima Hospital, Gadap Karachi from January 2021 to December 2022. Women with term singleton pregnancies scheduled for elective cesarean section at 37 - 38 weeks and at 39 -40 weeks of gestation without medical comorbidities were enrolled. All the patients were distributed into two groups: Group-A composed of pregnant women with gestational age 37-38 weeks and Group-B pregnant women with gestational age of 39 weeks. Data such as maternal age, gestational age, neonatal complications, parity, and neonatal weight were collected. Transient tachypnea of the newborn (TTN), sepsis, NICU admission, respiratory distress syndrome (RDS), and Well Baby Nursery were neonatal outcomes noted. Repeat C-Section, malpresentation, Cephalopelvic Disproportionation (CPD), maternal request were different causes for elective cesarean section. Women with gestational ages less than 37 weeks, multiple pregnancies, maternal chronic diseases, gestational diabetes, intra uterine growth restriction, CS during the active phase of labour, placenta previa or accreta, fetal abnormalities, and any other CS causes were excluded. Last menstrual period (LMP) was used for the calculation of gestational age.

Cases where gap increase >5 days, gestational age was calculated at 6-9 gestational weeks based on ultrasound criteria and verified by ultrasound at 11-14 weeks. SPSS version 27 was used for data analysis. Quantitative variables were presented as mean and standard deviation whereas qualitative variables were expressed as frequencies and percentages. Chi-square test was used for the comparison of different variables in both groups. For each dependent outcome variable such as RDS, NICU admission, TTN, and sepsis, a multivariate logistic regression model was built. The entire descriptive statistic was done using 95% confidence interval and 5% level of significance.

## Results

Of the total 200, pregnant women who delivered 37-38 (Group-A) and at 39-40 gestational weeks (Group-B) were 96 (48%) and 104 (52%) respectively. The incidence of various causes or indications of cesarean sections such as repeat C-Section, mal-presentation, Cephalopelvic Disproportionation (CPD), maternal request, and others were 45 (46.9%) vs. 38 (36.5%), 13 (13.5%) vs. 16 (15.4%), 15 (15.6%) vs. 7 (6.7%), 12 (12.5%) vs. 13 (12.5%), and 5 (5.2%) vs. 0 (0%) respectively. The incidence of perinatal outcomes such as NICU admission, respiratory distress syndrome (RDS), sepsis, and Transient tachypnea of the newborn (TTN) in group-A vs. group-B were 49 (51%) vs. 59 (56.7%), 55 (57.3%) vs. 17 (16.3%), 16 (16.7%) vs. 9 (8.7%), 35 (36.5%) vs. 9 (8.7%), and 16 (16.7%) vs. 1 (0.9%) respectively. The mean age of women who delivered in 37-38 pregnant weeks was  $26.82 \pm 6.32$  years, which was substantially older than women who gave birth at 39 gestational weeks ( $26.3 \pm 5.83$  years) ( $P = 0.039$ ). Table-I represents the distribution of patients in two groups based on their gestational weeks. Comparison of different causes of cesarean section is illustrated in Figure-1. Figure-2 depicts the comparison of incidence of perinatal outcomes. Comparisons of demographic details of both groups are shown in Table-II. Table-III represents the multivariate analysis between time of delivery and adverse outcomes.

TableI  
Patient's distribution based on their gestational age (n=200)

Group	No of patients (N)	Percentage %
Group-A	96	48
Group-B	104	52
Total	200	100

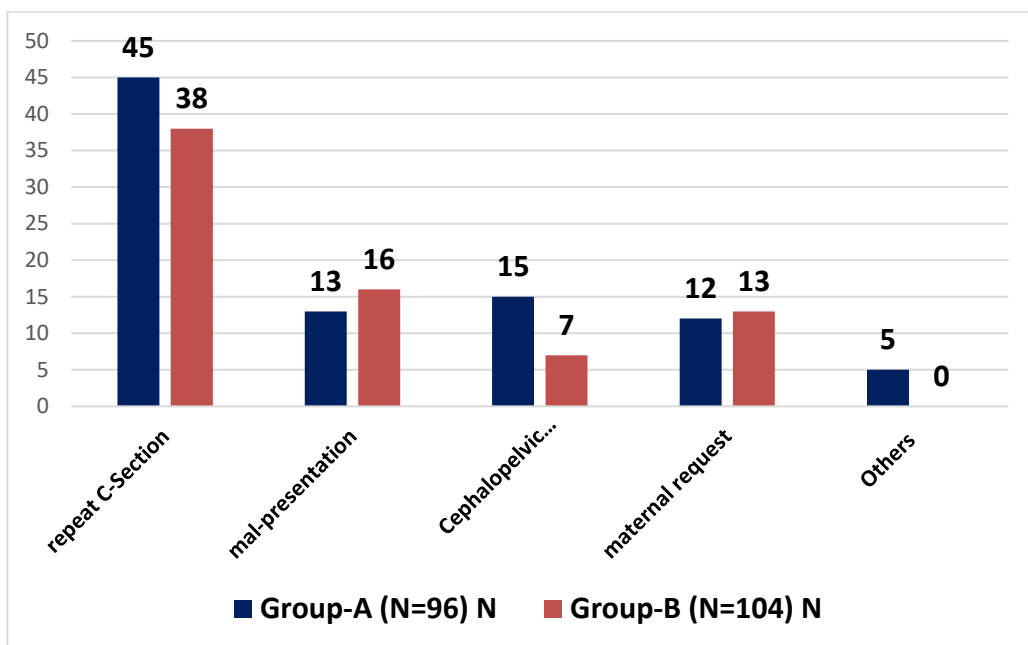


Figure 1. Incidence of various causes for cesarean section

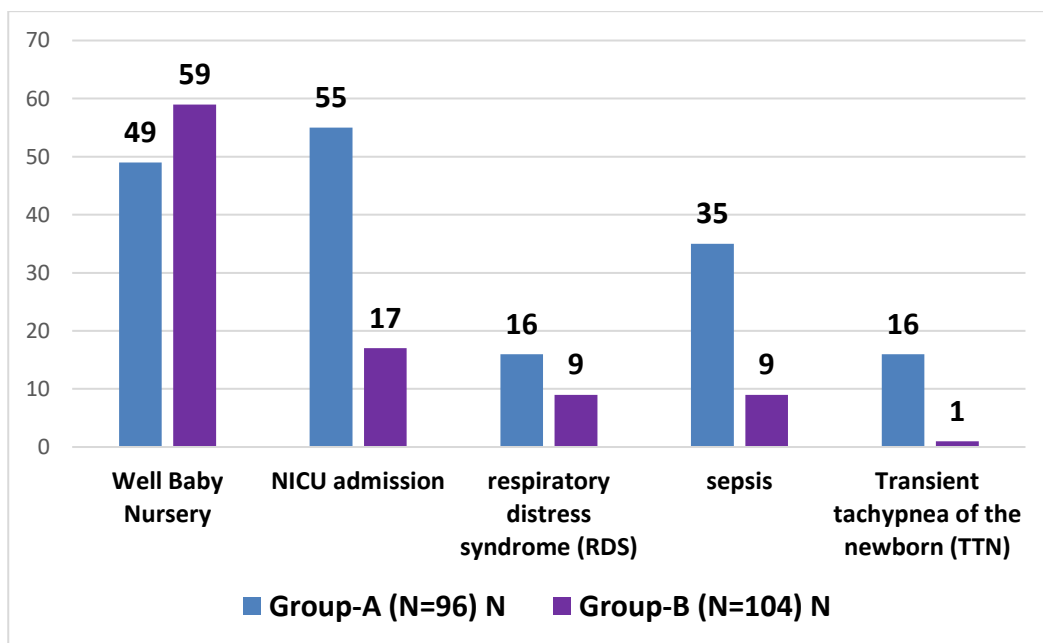


Figure 2. comparison of incidence of perinatal outcomes

Table II  
Comparison of demographic details of both groups

Variables	Group-A (37-38 gestational weeks) N (%)	Group-B (39 gestational weeks) N (%)	P-value
Maternal age (years)	26.82 ± 6.32	26.3 ± 5.83	0.039
Parity	1.90 ± 0.69	1.92 ± 0.76	0.735
Birth weight (g)	3186.82 ± 398.21	3342.62 ± 376.87	<0.01
Apgar score 1 mint	8.96 ± 0.19	8.98 ± 0.13	0.032
Apgar score 5 mint	9.98 ± 0.11	10.00 ± 0.07	0.53

Table III  
Multivariate analysis for adverse outcomes and time of delivery (37-38 vs. 39 gestational weeks)

Outcomes	Crude OR (95%CI)	Adjusted OR (95%CI)
NICU admission	2.87 (1.29–6.39)	2.61 (1.21–5.82)
RDS	2.29 (0.67–8.29)	2.11 (0.61–7.63)
TTN	3.11 (1.21–8.22)	2.89 (1.12–7.83)
Sepsis	1.63 (0.51–5.19)	1.59 (0.52–5.28)

## Discussion

The present study compared the neonatal outcome and complications in women who delivered 37-38 and after 39 gestational weeks undergone elective cesarean section and found that recurrent caesareans and Cephalopelvic Disproportion (CPD) are more likely in women who deliver between 37 and 38 gestational weeks than the women who deliver after 39 gestational weeks. In contrast, a higher rate of breech presentation and maternal request was found in women who delivered after 39 weeks' gestational weeks than women who delivered between 37 and 38 weeks' gestational weeks. According to this study, NICU admission and TTN risk was significantly higher in women who underwent elective CS delivery between 37 and 38 gestational weeks than those who delivered at 39 -40 weeks . Regarding outcomes, incidence of sepsis and respiratory dysfunction was similar in both groups. Vollmer et al. found comparable TTN and RDS among 415 pregnant women who had planned caesarean deliveries at 38 and 39 gestational weeks [15]. Another study by Butt et al. [16] found that lower incidence of RDS was found in women who delivered after 39 gestational weeks as compared to 37-38 gestational weeks.

The incidence of NICU admission in women underwent cesarean section 37-38 weeks vs. 39-40 weeks were 12.8% and 4.8% respectively [17]. Another study evidenced that a significant variation in different risk for neonatal adverse outcomes such as low birth weight, NICU hospitalization, and respiratory distress were found in 37-38 weeks elective cesarean cases [18]. It has been proposed that variations in the incidence of respiratory dysfunction in white and Asian newborns at different gestational ages may be attributable to genetic differences while the fetus grows in the uterus [19, 20]. Meconium-stained amniotic fluid has been seen in the majority of black and Asian neonates, indicating preterm [21].

TTN was the most common reason for NICU hospitalization in this research, not other significant problems as RDS or sepsis. Admission to the NICU may result in a significant financial burden. Huang et al. [22] found that elective cesarean section after 39 is economical. Nonetheless, the possibility of an emergency caesarean birth and the associated maternal problems should be considered. According to certain research, Asian and black populations had lower mean gestational ages than whites, which may be attributable to fetal preterm [23]. Complications for moms and infants can result from an emergency caesarean [24].

According to the current study, about 48% elective C/sections were done between 37-38 gestational weeks. Similarly, Curran et al. [25] reported that elective C/section was carried out in 48.3% and 8.3% women after 39 and 37-38 weeks respectively. Phaloprakarn et al. [26] observed that elective caesarean sections done before 39 weeks were almost 60%. Regardless of the published documents, it appears that physicians execute a substantial majority of CS births prior to 39 gestational weeks. There are number of factors might have led to the lack of research. First, at an era when gestational age was frequently calculated incorrectly based only on the last menstrual cycle rather first trimester scan. Second, the majority of children born are healthy and extremely large sample size would be required to detect obvious variations in neonatal outcome. C-sections are performed at a rate of roughly 33% in the United Kingdom [27]. One of the most prominent reasons for this rise is a decrease in the rate of attempted vaginal birth after caesarean delivery [28].

### **Conclusion**

The study proved that without any specific indication for elective cesarean section done at 39-40 weeks to improve neonatal outcome rather than at 37-38 weeks can give rise to unexpected NICU admissions.

### **Author's Contribution**

Concept & design of study: Dr.Musharaf Jahan

Statistical analysis and data collection: Dr.Nikhat Ahsan

Data Analysis+Drafting + reference writing: Dr Nazish Ali

Data Collection: Dr.Farheen & Dr.Naila

Literature review + Revisiting critically + final approval of version: Professor Dr. Farrukh Naheed

### **Conflict of interest**

The study has no conflict of interest to declare by any author.

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