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The Influence of Timing of Elective Cesarean Section on Neonatal Resuscitation Risk

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ABSTRACT

The number of cesarean sections (CS) performed worldwide has increased. Between 2000 and 2015, the percentage of babies born via cesarean section nearly doubled, rising from 12% in 2000 to 21% in 2015. The rise in primary and repeat CS accounts for this increase. The study's objective is to ascertain the early neonatal outcomes and the timing of elective cesarean births in singleton-term newborns. A descriptive cross-sectional study was conducted from November 1 to December 31, 2024, at the University Hospital's (UH) obstetrics and gynecology department. A computerized program called SPSS software (Statistical Package for the Social Sciences) 25 version was used to enter the extracted data from 201 pregnant women who were hospitalized for elective cesarean delivery. All variables were deemed statistically significant if their P-value was less than 0.05. 130 pregnant women, or 64.7% of the total, were between the ages of 26 and 35. In terms of parity, 149 pregnant women, or 74.1%, were multiparous. Most expectant mothers—86.6%—were certain of the date (174). The majority of patients (87.6%; 176) did not exhibit any prenatal problems. Previous cesarean sections, which accounted for 62.7% of current cesarean sections, were the primary indicator (126). A total of 87.1% (175) of neonates were born with a cephalic presentation, 10.9% (22) were born breech, and 2% (four) were born transversely. While 45.3% (91) of neonates were transported to the neonatal intensive care unit, where 20.4% (41) were placed under surveillance, 11.9% (24) had TTN, 8% (16) had RDS, 3.5% (seven) had neonatal jaundice, and 1.5% had neonatal hypoglycemia, 54.7% (110) of neonates were retained with their mothers. Additionally, 39.6% (36) of patients had admissions for fewer than 24 hours. The best time to have an elective cesarean section is crucial for achieving positive results for both the mother and the newborn, especially for expectant women who have had a previous cesarean delivery, which is high in the current study.

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INTRODUCTION

Worldwide, cesarean sections (CS) have increased [1–3]. From 12% in 2000 to 21% in 2015, the percentage of babies born via cesarean section has nearly quadrupled [1–4]. Most nations (63%) reported a CS rate higher than the WHO-recommended threshold, which states that CS rates should not surpass 10–15% of births. The rise in main and repeat CS accounts for this increase [4-5]. The cost of elective computer science varies significantly between nations and regions worldwide. According to routine data from the Euro-Peristat project, the percentage of elective CS varies from 0.5% of all births in Romania to 38.8% in Cyprus [6]. Malta (16.4%), Luxembourg (17.9%), and Italy (24.9%) are other nations with high elective CS rates [6]. A retrospective cohort study of 66,266 pregnant women in Asia, particularly China, revealed that 24.7% had elective CS between 2007 and 2013 [7]. Despite a known higher risk of infant unfavorable respiratory morbidities among simple-term pregnancies following elective cesarean sections as opposed to vaginal birth, high rates of elective cesarean sections have become a global constant [8]. Despite the startlingly high rates of elective cardioscopy, there are not many studies evaluating how the timing of these procedures affects the outcomes of newborns in the Middle East. The Middle Eastern nation of Lebanon has had a remarkable rise in CS, rising from 18% in 2000 to 47% in 2017—a 161% increase over 18 years [9–10].

METHODS

Study Setting

The study was conducted at University Hospital, Tripoli, Libya. It is a referral and tertiary medical center. It delivers clinical services for the population in Tripoli and areas nearby. Study design: Descriptive cross-sectional study.

Study period

From 1st November to 31st December 2024.

Study population

This study included 201 pregnant women who were admitted for elective cesarean delivery; the data was collected from patients, and the expected information was filled through a predesigned case sheet during the period.

Inclusion and exclusion criteria

All pregnant women whose assigned for elective cesarean section with singleton term (between 37 to 41 weeks)

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newborn and exclusion of emergency cesarean delivery, multiple gestations, preterm delivery and patients not given consent.

Study tool
The used case sheet includes 14 variables to determine the timing of elective cesarean deliveries and early neonatal outcomes in singleton-term newborns.

Statistical analysis
The extracted data was entered through the computerized program SPSS software (Statistical Package for the Social Sciences) 25 version to input and output the results into descriptive and inferential statistics, which are presented in a graphical and tubular manner. All variables are considered statistically significant with P – value less than 0.05.

RESULTS

This study includes 201 pregnant women who were admitted to the obstetrics and gynecology department of UH for elective cesarean delivery in 2024. The study headlines were divided into two groups: Demographic and maternal data and fetal and neonatal data.
Regarding the maternal age, 64.7% (130) of pregnant women were aged between 26 to 35 years 20.9% (42) were aged between 18 to 25 years and 14.4% (29) were aged between 36 to 46 years (Figure 1).

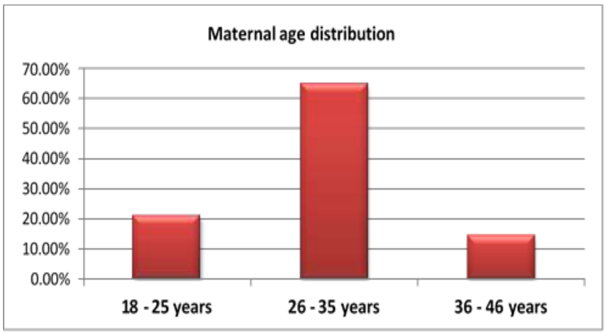

Figure 1. The maternal age distribution, H U, 2024.

Regarding parity, 74.1% (149) of pregnant women were multiparous, while 25.9% (52) were nulliparous. (Figure 2) 64.7% (130) had a repeated history of cesarean section, while 35.3% (71) had a primary cesarean delivery. The main indication of a current cesarean section was a previous cesarean section, which accounted for 62.7% (126) (Table 2). The majority of them had been delivered by spinal anesthesia, which accounted for 98% (197).

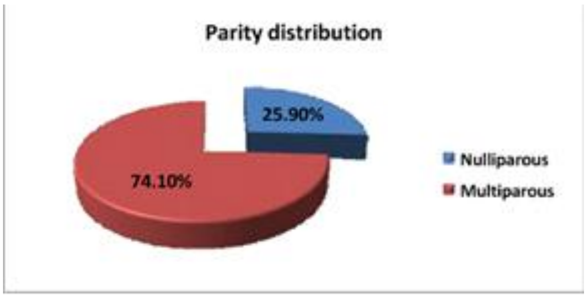

Figure 2. Parity distribution, H U, 2024.

Most neonates had delivered by cephalic presentation, which accounted for 87.1% (175), while 10.9% (22) by breech presentation and 2% (Four) by transverse presentation.
Regarding the gestational age at the time of delivery, 42.3% (85) were delivered at 38 weeks gestation, followed by 27.4% (55) at 39 weeks gestation (Table 3).

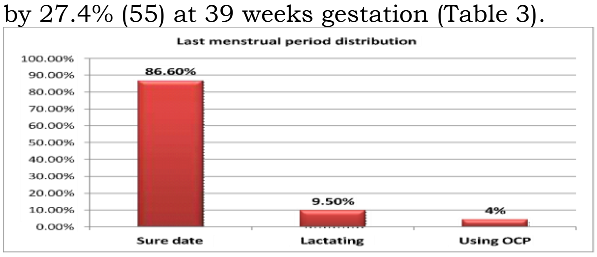

Figure 3. Last menstrual period distribution, H U, 2024

Table 1. Antenatal complications distribution, U H, 2024.

Variables (n = 201)	Frequency (N)	Percentage (%)
None	176	87.6%
Gestational hypertension	9	4.5%
Gestational diabetes	8	4.0%
Anemia	4	2.0%
Urinary tract infection	2	1.0%
Hypothyroidism	1	0.5%
Gestational thrombocytopenia	1	0.5%

Table 2. Indications of cesarean section distribution, U H, 2024.

Variables (n = 201)	Frequency (N)	Percentage (%)
Previous CS	126	62.7%
Malpresentation	24	11.9%
Maternal request	19	9.5%
Cardiotocography changes	13	6.5%
Cephalopelvic disproportion	5	2.5%
Meconium on early labor	5	2.5%
Good size baby	5	2.5%
Elderly PG	2	1.0%
Failed induction	1	0.5%
GDM	1	0.5%

Table 3. Gestational age distribution, U H, 2024.

Variables (n = 201)	Frequency (N)	Percentage (%)
37	25	12.4
38	85	42.3
39	55	27.4
40	26	12.9
41	10	5.0

56.7% (114) of neonates with birth weight were between 2 to 3.5 Kg while 40.3% (81) were between 3.5 to 4.5 Kg, 2% (four) were less than 2.5 Kg and 1% (two) were more than 5 Kg. 54.7% (110) of neonates had kept with their mothers while 45.3% (91) had transferred to neonatal intensive care unit which 20.4% (41) were on observation, 11.9% (24) had TTN, 8% (16) had RDS, 3.5% (Seven) had neonatal jaundice and 1.5% (Three) had neonatal hypoglycemia (Table 4), 39.6% (36) with duration of admission were less than 24 hours.

Table 4. Neonatal care unit admission causes distribution, U H, 2024.

(Variables (n = 91)	Frequency (N)	Percentage (%)
Observation	41	20.4%
TTN	24	11.9%
RDS	16	8.0%
Neonatal jaundice	7	3.5%
Neonatal hypoglycemia	3	1.5%
Total of NICU admissions	91	45.3%

DISCUSSION

This study includes 201 pregnant women who were admitted to the obstetrics and gynecology department of U H for elective cesarean delivery in 2022. Regarding the gestational age at the time of delivery, 42.3% (85) were delivered at 38 weeks gestation, followed by 27.4% (55) at 39 weeks gestation. An important concern for the optimal timing of elective delivery at term is the ongoing risk of stillbirth with increasing gestational weeks. In previous observational studies concerning the optimal timing of elective cesarean section, the stillbirth rate was not included because of study design limitations. [11]. One report suggested that a policy limiting elective deliveries occurring before 39 weeks has been linked to a higher risk of stillbirths at 37 to 38 weeks of gestation. However, additional research on stillbirth patterns in the US population has not indicated a connection between extended gestational weeks at term and stillbirth rates. Most existing studies on the timing of elective cesarean deliveries primarily focus on repeat procedures, while others only involve a limited number of primary cases, such as a study that examined just 788 cases of antepartum elective non-indicated cesarean deliveries.

Additionally, the main procedures may be linked to medical and obstetric reasons, potentially skewing the conclusion that elective cesarean delivery should take place after 39 weeks of gestation. According to a prospective study conducted at 19 academic centers in the U.S., transient tachypnea of the newborn (TTN), respiratory distress syndrome, and admissions to the neonatal intensive care unit (NICU) were the most common negative outcomes following early-term elective repeat cesarean sections across all gestational ages, with these issues being more frequent at 37 weeks compared to 39 weeks. [14-15].

National and institutional policies are required for better CS delivery procedures because there are several factors that influence the choice to do a CS. Regretfully, there are currently no laws or policies in place to lower the prevalence of CS in Lebanon [16]. The commercial health sector's domination over public bodies like the Ministry of Public Health to successfully set new standards for health care is one of the primary obstacles. The majority of obstetricians in Lebanon and the Order of Physicians oppose standardizing criteria to lower the rate of needless CS, despite the urgent necessity to do so. Enforcing doctors to get a second medical opinion before performing a CS is one suggestion to reduce the incidence of CS [17]. Implementing monthly evaluations of labor and delivery data to evaluate the quality of maternal care and the indications for the performed CS is another suggestion [18]. Other straightforward tactics could simply involve postponing delivery by 1-2 weeks till 39 weeks of gestation to at least lower the rate of neonatal morbidities, in addition to the pressing need to lower the rate of elective CS in Lebanon given the related maternal and neonatal problems [19].

Numerous studies conducted in the United States have demonstrated that fewer premature births that are not medically necessary can occur. When compared to physician education or the adoption of a "soft stop" policy that requires a local evaluation and decision-making by a peer review committee, Clark et al. (2010) have demonstrated that a strict "hard stop" hospital policy is the most effective intervention for reducing elective CS without any effect on stillbirth rates [20]. According to Clark et al., early-term deliveries dropped from 8.2% to 1.7% (P-value = 0.007), when hospital policies prohibiting elective deliveries before 39 weeks of gestation were established and enforced [21]. Furthermore, early elective CS has decreased by 50% and 38% in South Carolina and Oregon, respectively, as a result of state-wide hard-stop laws that restrict these deliveries [22]. The study's single-centered strategy was one of its limitations, but its excellent sample size was one of its strengths.

CONCLUSION

In summary, the optimal timing of elective cesarean section is an essential approach to achieving favorable maternal and neonatal outcomes, particularly among pregnant women with previous cesarean delivery which was reported to be high in the current study. Also, assessing the gestational age at the time of delivery is important to reduce the rate of neonatal intensive care unit admission and possible neonatal complications.

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