ORIGINAL ARTICLE

Minimally Invasive Intramedullary Fixation of Middle third clavicular Fractures Through the Medial Entry by Titanium Elastic Nailing System (TENS)

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Abstract

Background: ***Cesarean delivery is the most prevalent and important obstetric surgical procedure in the globe.***

Aim: ***This investigation aimed to determine whether there is an association between the period of manual extraction of fetus throughout repeated elective cesarean sections and the Apgar score.***

Patients and methods: ***This prospective observational investigation, involved one hundred pregnant women were selected from the attendee of Obstetrics and Gynecology department of Al-Azhar University Hospitals from April 2023 to March 2024.***

Results: ***The mean value of Anesthesia till cord clamping was 15.79 ± 4.05, and the mean value of uterine incision till cord clamping was 1.28 ± 0.51. 80% of neonates had no admission, 6% of neonates had TTN, 11% of neonates had RD2, and 3% of neonates had RD3. Regarding pregnancy outcome, 49% of neonates were males, while 51% of neonates were females. There was a highly statistically significant positive correlation between the increased time of uterine incision till cord clamping (U-CC) and low Apgar score, with the possibility of developing TTN or NICU admission. While there was insignificant association between the increased time among initiation of anesthesia till cord clamping (A-CC) and low Apgar score.***

Conclusion: ***The results revealed a significant positive association between the time of uterine incision until cord clamping (U-CC) and low Apgar score, potentially indicating TTN or NICU admission, and no significant association between the time among initiation of anesthesia till cord clamping (A-CC) and low Apgar score.***

Keywords: Repeated Elective Cesarean Section; Manual Fetal Extraction; Apgar Score

1. Introduction

Cesarean delivery is the most prevalent and important obstetric surgical procedure over the globe, and the incidence of cesarean delivery has been consistently increasing. During the past decade, the global estimated rate of CS has been fifteen percent. The delivery of the fetal cranium through the uterine incision is an important technical problem in the context of cesarean section. Difficult fetal extraction is encountered in between one and two percent of cesarean deliveries.[1]

Multiple methods were stated for the delivery of the head of the baby at the time of elective cesarean delivery. Simple manual delivery is the most prevalent method of delivery. The cases frequently experience pain, if not outright pain, as a result of the fundal pressure that the surgeon and assistant apply to deliver an unengaged fetal vertex through a thick lower uterine segment.[2]

The Apgar score is regarded as a reliable approach for evaluating the health of a neonate. Dr. Virginia Apgar developed the Apgar score in 1952 as a repeatable and simple approach to summarize and rapidly evaluate the health of newborns following their birth. A higher possibility of subsequent cerebral palsy (CP), newborn encephalopathy, and cognitive difficulties is positively correlated with an extremely low Apgar score at five minutes.[3]

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Cesarean deliveries are now the most common surgery in obstetrics. The emergence of newborn respiratory diseases, particularly the occurrence of transient tachypnea in the newborn, has been mirrored by this circumstance. A cesarean section is frequently carried out when a vaginal delivery might endanger the life or health of the mother or the infant; however, in more recent years, it has also been requested for deliveries that would have otherwise been natural.[4] So, this study aimed to find if there is any association between the period of manual extraction of the fetus through repeated elective cesarean section and the Apgar score

2. Patients and methods

This prospective observational investigation involved one hundred pregnant women who were selected from the attendees of the Obstetrics and Gynecology department of Al-Azhar University Hospitals from April 2023 to March 2024.

Inclusion criteria: females aged between eighteen and thirty-nine years, women scheduled for elective cesarean section, history of prior CS delivery, 38 weeks or more, Singleton pregnancy, and spinal anaesthesia.

Exclusion criteria: Fetal congenital malformation, fetal malpresentation (non-cephalic presentation), maternal coagulation disorder, associated maternal comorbidity, Patient's refusal to participate, fetal post-maturity, and non-reassuring non-stress test.

Sample size

This investigation has been depending on the research conducted by Mohamad et al.,[5] and the sample size has been determined using 5 Epi Info STATCALC, which has been founded on the following assumptions: - A capacity of eighty percent and a two-sided confidence level of ninety-five percent and the odds ratio was calculated with a five percent error, which is 1.115. From the Epi-Info output, the final maximum size of the sample was one hundred.

Methods

All cases have been subjected to the following:

Complete history taking: Personal history, Complaint & its duration, obstetric history, menstrual history, Present history, history of sensitivity to drugs, Past Medical history, Past Surgical history, and Family history. Physical examinations: General examination and a non-stress test were included.

Investigational Studies

Routine laboratory investigations: Complete blood count (CBC), kidney and Liver functions, urine analysis, PT, PTT, and INR, and Radiological investigation: Biophysical profile (BPP) to measure the fetal heart rate, while ultrasound creates an image of the fetus using high-frequency sound waves. Typically performed in the last trimester, it includes five parts: nonstress test, ultrasound assessment, and fetal breathing movements.

Surgical technique

Cesarean section was performed for all women with spinal anesthesia. The procedure involved a Pfannenstiel skin incision, transverse opening of the rectus sheath, peritoneum, bladder dissection, lower uterine segment opening, and fetal membrane incision. Manual fetal extraction was performed using fundal pressure, with the obstetrician directing the head of the fetus through the incision. The fetal head was then raised and delivered through the incision using fundal pressure. The procedure included recording the time from anesthesia to cord clamping and neonatal assessment using the Apgar score at one and five minutes. The Apgar test had been carried out by a physician, or the health care provider checks the baby's: Heart rate, muscle tone, skin color, reflexes, and Breathing effort, based on the noticed condition, each category has been assigned a score of 0, 1, or 2.

Ethical Consideration

The data that was collected from participants was kept confidential. The names of the participants who took part in the research have not been mentioned in any of the reports or publications that have been written about the research. The purpose and nature of the research, as well as the risk-benefit assessment, have been conveyed to the participants prior to their admission to this research. Consent has been obtained with full knowledge. The protocol has been submitted for the Research Ethics Committee's approval. Prior to enrollment in the investigation, cases were granted informed consent. The confidentiality of all data has been maintained. The treatment of all participants was not affected by their decision to withdraw from the investigation.

Statistical Analysis

The collected data have been coded, processed, and analyzed utilizing the SPSS program (Version 25) for Windows. For the purpose of descriptive statistics, measurements such as means, standard deviations, medians, ranges, and percentages were computed. Independent t-tests were used to compare the means of data that follow a normal distribution for continuous variables. Mann-Whitney test U tests have been used to compare the median variances of data that did not have a normal distribution, and chi-square tests were utilized for categorical data. Both of these tests have been applied. For the purposes of statistical analysis, a p-value that is lower than 0.05 is considered statistically significant: P-value greater than 0.05: non-significant (NS), P-value lower than 0.05: significant (S), and P-value lower than 0.01:

Highly significant (HS).

3. Results

The mean age was 29.6±6.28, the mean gestational age was 37.96±3.58, the mean Parity was 1.87±1.35 and the mean gravidity was 3.27±1.66. (Table 1)

Table 1. Distribution of general characteristics in the group under investigation.

	STUDIED GROUP (N=100)
AGE MEAN ±SD	29.6±6.28
GESTATIONAL AGE MEAN ±SD	37.96±3.58
PARITY MEAN ±SD	1.87±1.35
GRAVIDITY MEAN ±SD	3.27±1.66

The mean value of hemoglobin was 10.79 ± 0.73, and the mean value of AFI was 8.14 ± 2.35. (Table 2)

Table 2. Distributions of hemoglobin and AFI data in the studied group.

	STUDIED GROUP N=100
HEMOGLOBIN (G/DL) MEAN ± SD	10.79 ± 0.73
AFI MEAN ± SD	8.14 ± 2.35

AFI: amniotic fluid index.

The mean Apgar score at 1 min was 7.46 ±0.94 and the mean Apgar score at five min was 8.45 ±0.84. (Table 3)

Table 3. Distribution of Apgar score in the studied group.

	STUDIED GROUP (N=100)
APGAR SCORE AT ONE MINUTE MEAN ±SD	7.46 ±0.94
APGAR SCORE AT FIVE MINUTES MEAN ±SD	8.45 ±0.84

The mean value of Anesthesia till cord clamping was 15.79 ± 4.05, and the mean value of uterine incision till cord clamping was 1.28 ± 0.51. (Table 4)

Table 4. Distributions of A-CC and U-CC data in the studied group.

	STUDIED GROUP N=100
A-CC (MINUTES) MEAN ± SD	15.79 ± 4.05
U-CC (MINUTES) MEAN ± SD	1.28 ± 0.51

A-CC: Anesthesia cord clamping, U-CC: uterine cord clamping.

There were 80% of neonates had no admission, 6% of neonates had TTN, 11% of neonates had RD2 and 3% of neonates had RD3. Regarding pregnancy outcome, 49% of neonates were males while 51% of neonates were females. (Table 5)

Table 5. Distribution of Admission and fetal outcomes in the studied group

	STUDIED GROUP N=100
ADMISSION	
NO	80 (80%)
TTN	6 (6%)
RD2	11 (11%)
RD3	3 (3%)
PREGNANCY OUTCOME	
MALE	49 (49%)
FEMALE	51 (51%)

TTN; Transient Tachypnea of Newborn, RD; Respiratory depression

There was highly statistically significant positive correlation between the increased time of U-CC and low Apgar score with possibility of developing TTN or NICU admission. While there was no significant association among the increased time between initiation of A-CC and low Apgar score. (Table 6)

Table 6. Correlation between U-CC, A-CC, Apgar Score and admission.

		U-CC	A-CC
LOW APGAR SCORE	r	0.566	-0.198
	p-value	≤0.001**	0.039
ADMISSION	r	0.607	-0.202
	p-value	≤0.001**	0.044

r: pearson correlation, **p-value not more than 0.001 is highly statistically significant, *p-value not more than 0.05 is statistically significant

4. Discussion

Cesarean section is related to an increased probability of adverse obstetric and prenatal results in the subsequent birth, including antepartum hemorrhage, placenta previa, malpresentation, extended labor, uterine rupture, placenta accreta, reduced birth weight, preterm birth, and stillbirth in the 2ed delivery.[6,7]

The Apgar score is a quick method for assessing the physical condition of newborns, as it is measured at one and five minutes following delivery. The five-minute score is now considered to be a more accurate predictor of infancy survival than the other score.[8]

The main outcomes of this investigation were as follows:

The current investigation demonstrates that regarding demographic data, the mean age was 29.6±6.28, the mean gestational age was 37.96±3.58, the mean parity was 1.87±1.35, and the mean gravidity was 3.27±1.66.

In accordance with our findings, Mohamad et al.[5] conducted an investigation into the association between the duration of extraction of fetus through cesarean section and the Apgar score. This investigation involved one hundred pregnant females who underwent elective cesarean section. They found that regarding demographic data, the mean age was 26.93±5.57, the mean gestational age was 39.31 ± 1.24.

Additionally, our findings are in accordance with the outcomes of Farouk Zaki Mousa et al.,[9] who aimed to evaluate the correlation between the duration of extraction of fetus through cesarean section and the occurrence or presence of transient tachypnea in the neonate. Fifty pregnant females participated in this

investigation. The mean gestational age of the selected cases was 38.93±0.76, with a range of thirty-eight to forty weeks. The mean maternal age in the current research was 28.64±5.53, with a range of eighteen to forty years old.

In our investigation, we detected that regarding the distribution of Apgar score, the mean Apgar score at one minute was 7.46 ±0.94 and the mean Apgar score at five min was 8.45 ±0.84.

Our results are consistent with Hussein et al.,[10] who reported that regarding the distribution of Apgar score, the Apgar score after one minute and after five minutes was 5.6±1.5 and 8.2±1.3.

In our study we found that the mean value of Anesthesia till cord clamping (A-CC) was 15.79 ± 4.05, and the mean value of uterine incision till cord clamping (U-CC) was 1.28 ± 0.51.

Our results are consistent with, Hussein et al.,[10] who reported that the mean time from initiation to cord clamping was 17.5±4.6 minutes while the time from uterine incision till cord clamping was 2.4±1.1 minutes.

In our study, we found that regarding admission, there were 80% of neonatal cases had no admission, 6% of neonatal cases had TTN, 11% of neonatal cases had RD2, and 3% of neonatal cases had RD3. Regarding pregnancy outcome, 49% of neonates were male while 51% of neonates were female.

In the same line, Mohamad et al.,[5] who found that regarding admission, 7 (7%) of neonates had TTN. Regarding pregnancy outcome, 48 (48%) of the neonates were male while 52 (52%) of the neonates were female.

Moreover, our findings are in agreement with the findings of ZAHER et al.,[11] who stated that eight newborns (8 percent) developed TTN and were admitted to the NICU for additional treatments, out of the one hundred delivered newborns. In terms of pregnancy outcomes, forty-eight (forty-eight percent) of neonates were men, while fifty-two (fifty-two percent) were women.

Moreover, Alkhiary et al.,[12] who found that regarding admission, there were 6% of neonatal had TTN, 11% of neonatal had RD2 and 3% of neonatal had RD3. Regarding pregnancy outcome, 47.3% of neonatal were male while 52.7% of neonatal were female.

In our study we found that there was highly statistically significant positive association among U-CC and Admission, while there was highly statistically significant negative association among U-CC and Apgar score at 5 min.

Contrary to our findings, ZAHER et al.,[11] found that the five-minute Apgar score did not exhibit an association with the I-C & U-C intervals, the various variables of the research, or both.

4. Conclusion

The outcomes revealed that a highly statistically significant positive association has been detected between the increased time of U-CC and low Apgar score with possibility of developing TTN or NICU admission. While there was no significant correlation between the increased time between initiation of A-CC and low Apgar score.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

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There are no conflicts of interest.

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