Procedia of Engineering and Medical Sciences
Volume: 08 | 2023

Outcomes of Neuraxial Anaesthesia for Iraqi Patients Who Underwent Cesarean Section

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Annotation. Background: Anesthesia is considered an important factor and an essential procedure for performing caesarean sections for all pregnant women, despite their high cost compared to vaginal delivery. Objective: This study aims to evaluate the role of neuraxial anesthesia on Iraqi women who underwent cesarean section. Patients and Methods: This cross-sectional study recorded data on women aged (25-40) in different hospitals in Iraq for the period April 14th, 2022, to September 18th, 2023. Most clinical outcomes were collected for pregnant women who underwent cesarean section. Eighty pregnant women who underwent a caesarean section under anesthesia were recruited. The women were divided into two groups. The first group included women who underwent a cesarean section under nerve anesthesia and included 50 patients, while the second group included women who underwent general anesthesia and included 30 patients. To determine the importance of neuraxial anesthesia, the rate of pain, postoperative results, and quality of life of patients who underwent a cesarean section under neuraxial anesthesia were studied and evaluated in comparison with the other group, which represents the group of patients under general anesthesia. Results: Clinical records and results show that women aged (36-40) years were the largest group who underwent a cesarean section. This study showed the results during the

cesarean section for the neuraxial anesthesia group, where the duration of the operation was (40.2 ± 5.6) minutes, (2.8 ± 0.2) days, blood transfusion with 10 cases, the duration of stay in the hospital was 2.8 ± 0.2, and the mortality rate was 2 cases, which shows an improvement for women compared to the other group. For the group of women under general anesthesia, the duration of the operation was (42.7 ± 9.6) minutes, blood transfusion included 28 cases, the length of stay in the hospital was (3.4 ± 1.2), and the mortality rate was 6 cases. Regarding negative cases, this study found an improvement in patient outcomes, as it indicated that only four cases were recorded as negative cases, the most prominent of which was infection, with a rate of only two cases, while in general anesthesia, where 10 cases were recorded, the majority of which were infections, with a rate of 5 cases, and bleeding, with a rate of only two cases. Conclusion: This study shows that neuraxial anesthesia represents the most controlled and safest solution for women's comfort during and after surgery compared to general anesthesia.

Keywords: Cesarean section; Neuraxial anaesthesia; Apgar scale; and quality of life.

Introduction

A cesarean section is a procedure that can be performed under general or neuraxial anesthesia. Since general anesthesia in cesarean section has been associated with various complications, it is increasingly less used as an anesthetic technique of choice [1]. Despite this, between 0.5 and 1% of cesarean sections performed are still performed under general anesthesia. [2]

Birth is a profound experience and, at the same time, a complex physiological process [3]. The objective that childbirth culminates in the birth of a healthy baby without harming maternal health has led to the institutionalization of childbirth, its systematic medical management, and the development of new medical and surgical interventions that require multidisciplinary teams, the anesthesiologist being an important part of them [4,5]. In recent decades, there has been an important expansion in the development and use of various techniques designed to initiate, accelerate, regulate, or monitor the childbirth process in order to improve the outcome for mothers and babies. [5,6]

The birth of a child by caesarean section is a momentous event in women's lives, and the type of care given to them has important effects on them and their babies, both physical and emotional, in the short and long term [7]. This is where the role of the anesthesia staff is paramount since pain control will greatly influence the experience of childbirth/cesarean section and the perception that the pregnant woman will have of them. [8]

Whether during normal childbirth, cesarean section or, emergency childbirth, or cesarean section, the intervention of the anesthesiologist will be of vital importance both for pain control and for the control of physiological parameters and to ensure that the process is carried out in the safest possible way. [9,10]

International guidelines recommend the use of neuraxial anesthesia over general anesthesia; this is mainly considering the risk of failed intubation and aspiration of gastric contents in the pregnant woman [11]. However, general anesthesia is still an option when there is not enough time to perform neuraxial anesthesia, when the latter is contraindicated, or when there is rejection of the puncture by the patient. [12]

The incidence of caesarean section with respect to vaginal delivery has increased in recent years [13]. In the USA, caesarean section it has gone from 10% in 2010 to 30% in 2016; in Europe, despite its increase, its incidence does not exceed 20% [14]. In our Center, in the last year, 2020, the rate of C-sections is 33%, although this figure increases in mothers with previous C-sections and those multiple pregnancies resulting from in vitro fertilization [15]. This progressive increase in the caesarean section is accompanied by a decrease in perinatal mortality <20/1000 [16]. In general, the most frequent causes of cesarean section are dystocias of dilation and progression of labor and previous cesarean sections, with an incidence of 40%, and fetal ditress only accounts for 5% of cesarean sections [17,18]. Pregnant women with previous pathology, the incidence of maternal death after cesarean section is five times higher than after vaginal delivery; and intrapartum cesarean section has a 1.4 times higher risk of maternal mortality than elective cesarean section. [19,20]

Patients and methods

A cross-sectional study was conducted that contributed to the evaluation and analysis of the results of women patients aged (25-40) who underwent a cesarean section in different hospitals in Iraq. This study continued for a period between April 14th, 2022, to September 18th, 2023. This study collected clinical and demographic data for female patients. These characteristics included age, gender, body mass index, gestational age, comorbidities, gravity, parity, anesthesia used in the operation, level of education, and work status.

Regarding the caesarean section data, 80 women who underwent a caesarean section were recruited and divided into two groups. The first group includes women who underwent a caesarean section under nerve anesthesia and included 50, and the second group is the group of women who underwent general anesthesia and included 30 patients. Surgical data were recorded, including surgery time, estimated blood rate, number of patients transfused at the time of hospitalization, length of hospital stay, mortality rate, and admission of patients to the intensive care unit. In addition, blood tests were performed to examine the women's hemodynamics before, after, and during the operation in terms of Hemoglobin, Hematocrit, SBP, DBP, Heart Rate, and Postoperative Oxygen Saturation (%).

This study determined data extracted from caesarean sections for newborn patients, which included fetal weight, the number of previous births for women, as well as meconium smear, attendance at the pediatric clinic, and admission of newborns to the hospital.

Furthermore, this study demonstrated patient data and adverse patient outcomes in which potential postoperative complications were identified. Also, this study recorded the rate of pain for postoperative women during the first 10 minutes after surgery compared between both groups. In addition, this study evaluated women's postoperative quality of life within four basic criteria, which included physical, psychological, social, and environmental factors, using the Whoqol-BREF questionnaire scale.

Results

Table 1: Baselines demographic characteristics for women patients in this study.

Characteristics	Number of patients [80]	Percentage [%]
Age, years N [%]		
25 – 30	23	28.75%
31 – 35	24	30%
36 – 40	33	41.25%
Gestational age (weeks), [mean ± SD]	36 ± 0.5	
BMI [kg/m2], N [%]		
< 30.0	33	41.25%
≥ 30.0	47	58.75%
Comorbidities, N [%]		
Non	30	37.5%
Diabetes	14	17.5%
Hypertension	10	12.5%
Thyroid Disorders	8	10%
Cardiac Arrhythmias	7	8.75%
Asthma	7	8.75%
Chronic renal diasese	4	5%
Gravidity, [mean ± SD]	2.53 ± 1.15	2.42 ± 1.36
Parity, [mean ± SD]	1.33 ± 0.9	1.28 ± 0.87
Anesthesia provides N [%]		
GA, [general anesthesia]	30	37.5%
NA, [neuraxial anaesthesia]	50	62.5%
Education level, N [%]		
Primary school	11	13.75%
Secondary school	20	25%
Under graduated college	23	28.75%
Post graduated college	26	32.5%
Working status, N [%]		

Employed	30	37.5%
Unemployed	50	62.5%

Table 2: Determine the clinical data of patients who underwent cesarean section for both groups.

Variables	NA group, 50	GA group, 30	P-value
Operative time [min]	40.2 ± 5.6	42.7 ± 9.6	0.72
Estimated blood loss (mL)	557.11 ± 40.81	1950.47 ± 184.62	0.0013
Blood Transfusion	10 [12.5%]	28 [35%]	0.00121
Recovery time, weeks	1.2 ± 0.56	4.44 ± 2.8	0.021
Length of stay in hospital, Days	2.8 ± 0.2	3.4 ± 1.2	0.61
Mortality rate	2 [4%]	6 [20%]	< 0.001
Intensive care unit admission [ICU]	4 [8%]	9 [30%]	0.0015

Table 3: Determine hemodynamics of women patients during, before, and after cesarean section.

Variables	NA group, 50	GA group, 30	P-value
Hemoglobin (g/dl)			
Preoperative	11.3 ± 0.54	11.6 ± 0.62	0.366
Postoperative	10.52 ± 0.3	9.6 ± 0.54	0.086
Hematocrit (%)			
Preoperative	36.56 ± 1.77	37.68 ± 1.6	0.351
Postoperative	32.65 ± 2.54	32.83 ±2.6	0.79
SBP (mmHg)			
Intraoperative	98.64 ± 9.12	107.5 ± 9.8	< 0.0001

Postoperative	100.2 ± 8.84	109.63 ± 9.7	0.001
DBP (mmHg)			
Intraoperative	58.77 ± 9.72	70.5 ± 7.86	0.001
Postoperative	64.51 ± 6.7	68.50 ± 8.3	0.72
HR (beats/min)			
Intraoperative	85.60 ± 2.66	85.40 ± 3.84	0.585
Postoperative	84.20 ± 2.2	85.3 ± 3.1	0.21
Postoperative oxygen saturation (%)	98.65 ± 0.85	92.40 ± 0.80	0.071
Time till open bowel (h)	6.75 ± 1.73	8.82 ± 1.85	0.001
Urine output first hour (ml)	172.11 ± 30.58	180.45 ± 36.56	0.0022
First requirement for analgesia (min)	330.34 ± 233.50	176.47 ± 131.22	< 0.001
Total requirement for analgesia [min]	1.40 ± 0.61	2.1 ± 0.58	0.001

Table 4: Neonatal Findings:

Variables	NA group, 50	GA group, 30	P-value
Brith weight [Grams]			0.048
< 2500	4 [8%]	5 [10%]	
> 2500	46 [92%]	45 [90%]	
Number of previous births N [%]			0.0473
0	25 [50%]	17 [56.67%]	
1	16 [32%]	9 [30%]	
> 1	9 [18%]	4 [13.33%]	
Meconium staining			0.0032
Yes	1 [2%]	6 [20%]	
No	49 [98%]	24 [80%]	
Pediatric clinic attendance			0.025
Yes	2 [4%]	7 [23.33%]	

No	48 [96%]	23 [76.67%]	
Neonatal hospitalization			0.024
Yes	2 [4%]	5 [16.67%]	
No	48 [96%]	25 [83.33%]	

Table 5: Negative findings of women after cesarean section.

Variables	NA group,	GA Group	P-value
Infection	2 [4%]	5 [16.67%]	0.0233
Bleeding	1 [3.33%]	2 [6.67%]	0.0493
Blood clots	1 [3.33%]	2 [6.67%]	0.0493
Respiratory issues	0 [0%]	1 [3.33%]	0.034
Total cases	4 [13.33%]	10 [33.33%]	0.0021

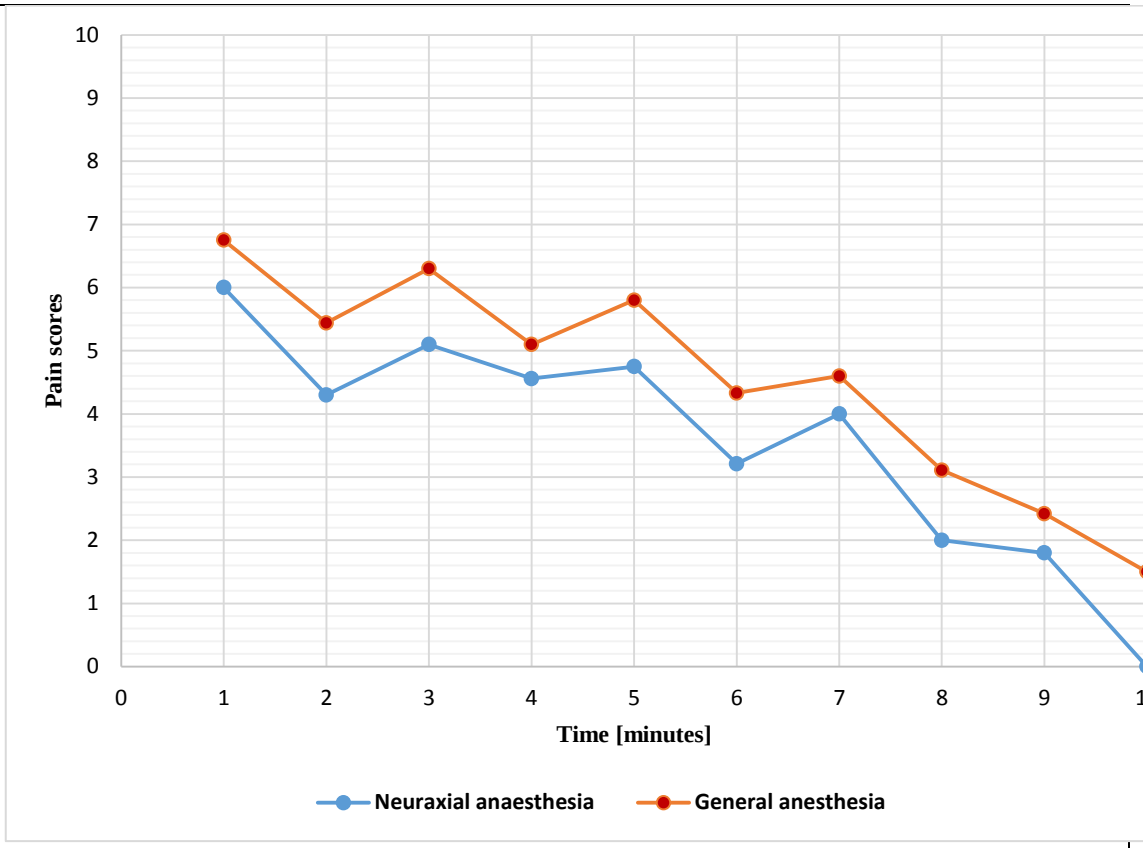

Figure 1: Postoperative pain scores of patients by Apgar scale.

Table 6: Assessment of quality of life related to women after cesarean section by the Whoqol-BREF questionnaire scale.

Variables	NA group,	GA Group	P-value
Physical	76.69 ± 14.80	65.87 ± 8.52	0.0822
Psychological	70.57 ± 16.33	67.66 ± 17.46	0.0475
Social	74.20 ± 20.4	67.50 ± 18.23	0.0362
Environmental	73.21 ± 16.58	66.40 ± 13.20	0.035

Discussion

This study indicated that women between the ages of 36 and 40 had the highest rate of undergoing cesarean sections, as it reached 33 cases, as the average gestational age was (36 ± 0.5). Women with a BMI < 30.0 reached 33 cases, and those with a BMI ≥ 30 was 47, and diabetes with 14 cases and hypertension with 10 cases were the most common comorbidities among female patients.

The patients' surgical data were recorded. This study showed the extent of the effect of neuraxial anesthesia during the cesarean section in providing comfort and safety during and after the cesarean section for women. Surgical results were recorded, which included the duration of surgery (40.2 ± 5.6) minutes, estimated blood loss was (557.11 ± 40.81), hospitalization time was (1.2 ± 0.56) weeks, the number of cases undergoing blood transfusion was 10, and the duration of stay in the hospital was (2.8 ± 0.2 days and the death rate included 2 cases and intensive care unit admission was 4 cases. Regarding the results of general anesthesia, the surgical results were recorded, which included the duration of surgery (42.7 ± 9.6) minutes, estimated blood loss was (1950.47 ± 184.62), recovery time was (4.44 ± 2.8) weeks, the number of cases subject to blood transfusion was 28 cases, and the length of stay. In the hospital (3.4 ± 1.2) days, the death rate included 6 cases, and intensive care unit admission was 9 cases.

The rates of the group of patients undergoing neuraxial anesthesia showed a variation in the patients' data before and after surgery, where Hemoglobin was (11.3 ± 0.54) (g/dl) and (10.52 ± 0.3), Hematocrit (%) before surgery was (36.56 ± 1.77).) and postoperatively (32.65±2.54), SBP during surgery was (98.64±9.12) and postoperatively (100.2±8.84), intraoperatively 58.77±9.72 and postoperatively 64.51±6.7 and heart rate during surgery was 85.60±2.66 and postoperatively. Surgery was 84.20 ± 2.2, and Postoperative oxygen saturation (%) was 98.65 ± 0.85.

This study identified potential complications for the collected samples, which included 4 cases, of which infection included 2 cases, bleeding included 1 case, and blood clots, while the general anesthesia group included 5 cases of infection, 2 cases of bleeding, and 2 cases of blood clots. Also, significant differences were shown in the pain scores, where in the first minute, the pain score was 6; in the fifth minute, it was 4.75; and in the tenth minute, the pain score was 0, while in the general anesthesia group, where in the first minute the pain score was 6.75, the fifth minute was 5.8, and the tenth minute was 1.5. To compare between the two groups, the results of the patient's quality of life showed that the physical factor was 76.69 ± 14.80 for the neuraxial anesthesia group and the social factor was 74.20 ± 20.4, which show the excellent patient quality of life for the patients who underwent neuraxial anesthesia compared to the general anesthesia group, which had both the physical factor 65.87 ± 8.52 and the social factor 67.50. ±18.23.

According to previous studies, the results of some studies have shown the effectiveness of the nerve anesthesia technique in controlling, controlling and managing pain during and after the surgical operation, with speed of recovery, hospital stay rate, and mortality rate being lower, which avoids causing complications and negative risks that may increase the speed of the respiratory rate, and heartbeat, which results in negative results, although other studies have indicated that nerve damage is the most common and widespread complication in patients who have undergone nerve anesthesia, but the incidence rate is rarely induced and is often very low [21-24]. A German study also indicated that neuraxial anesthesia avoids any respiratory suppression, which may greatly help women with risk during the operation to avoid severe postpartum complications that impair women's quality of life in the long term. [25]

Conclusion

This study demonstrates the success of the neuraxial anesthesia technique in managing women's pain during and after cesarean section, which shows excellent control and safety in the mother's comfort during childbirth. This study indicated that neuraxial anesthesia is the optimal anesthesia in the management of caesarean sections for women due to the advantages it possesses, such as a faster recovery time and a lower hospital stay rate. Moreover, neuraxial anesthesia controls the management of the operation as it allows the woman to remain awake and avoids negative outcomes compared to general anesthesia. As a result, this study recorded the rate of possible complications for women after cesarean section, which included only 4 cases for the neuraxial anesthesia group while 14 cases for the general anesthesia group, the most prominent of which were infection, bleeding, and blood clots.

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