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ORIGINAL ARTICLE

Do Different Types of Anaesthesia for Cesarean Delivery cause Subacute Low Back Pain ?

MOHAMED G. ALI [1], ABEER A. MOHAMMED[2],MOHAMMED A. SOLIMAN[3], REHAB S. MAMOON [1], MOHAMMED A. SARHAN[4], AMEL M. YOUSSEF[5], AND FAHIMA M. OKEEL[5].

[1]*Department of Physical Therapy for Women's Health, Faculty for Physical Therapy, South Valley* University*, Qena, Egypt.*

[2]*Department of Physical Therapy for Neuromuscular Disorder, Faculty for Physical Therapy, Cairo University, Cairo, Egypt.*

[3]*Department of Medical Anesthesiology, Faculty of Medicine, South Valley University, Qena, Egypt.*

[4]*Department of Physical Therapy for Musculoskeletal Disorders, Faculty for Physical Therapy, South Valley* University*, Qena, Egypt.*

[5]*Department of Physical Therapy for Women's Health, Faculty for Physical Therapy, Cairo University, Giza, Egypt.*

** The corresponding author: Mohamed Gamal Ali. , Telephone: +20 101 439 7608, Mail address: dr_m.gamal1987@svu.edu.eg*

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ABSTRACT

Background: Low back pain is a common complaint after cesarean delivery, different causes may be involved however they are poorly understood due to many confounders.

Methodology: We performed this retrospective cohort study to assess the intensity of low back pain among 38 women (26 of them underwent cesarean delivery, assessed after 6 to 12 weeks from delivery date, they were classified into: epidural anaesthetic group (Group A) n.=6, spinal anaesthetic group (Group B) n.=13, general anaesthetic group (Group C) n.=7 and they were either primiparous or multiparous who did not receive any type of anaesthesia for at least one year prior to the last obstetric anaesthesia while the other 12 women were the control group (Group D) who didn't experience any pregnancy or anaesthesia.

Results: The mean values of visual analogue scale (VAS) in Group A, Group B, Group C, and Group D were 5.00 ±1.67, 4.62 ±1.12, 5.14 ±1.21, and 2.17 ±0.71, respectively. The ANOVA test revealed a significant difference in VAS among groups A, B, C, and D. Despite, the post-hoc test revealed a significant difference in VAS between group A versus group D, group B versus group D, and group C versus group D, but there were no significant differences between group A versus group B, group A versus group C, and group B versus group C.

Conclusion: Cesarean delivery with different anaesthetic types as: epidural, spinal and general anaesthesia was associated with subacute low back pain without significant differences in pain intensity between these anaesthetic types.

Key words: Neuraxial Anaesthesia, General Anaesthesia,Cesarean Delivery, Subacute Period, Low Back Pain.

INTRODUCTION

Cesarean section is one of the most common surgical procedures in obstetrics, and it is also one of the oldest medical procedures **[1].** Despite the international approaches to decrease the rate of cesarean delivery universally **[2]**. In Egypt, the prevalence of CS has risen dramatically over the last decade, with the most recent Egypt Demographic and Health Survey (EDHS) reporting a rate of 52 percent **[3].**

The anaesthetic strategy used for caesarean section is determined by several criteria, including the patient's physiological condition, the practitioner's level of experience, drug availability, and equipment, among others **[4].**

The gold standard anaesthesia for caesarean delivery has been and continues to be neuraxial anaesthesia **[5]**. The most frequent central neuraxial anaesthesia techniques used as the surgical procedure and for labor and delivery are spinal and epidural anaesthesia **[6].**

For neuraxial anaesthesia, two popular approaches are median and paramedian. The median technique is the most usual, and it entails passing the needle through the supraspinous, interspinous, and ligamentum flavum ligaments **[7].** The needle is typically inserted in the L3/4 or L4/5 interspace for neuraxial anaesthesia **[8].**

Low back pain (LBP) is a typical mild but unpleasant consequence of epidural anaesthesia. It is thought to be caused by needle trauma and local anaesthetic myotoxicity **[9]**, postdural puncture backache (PDPB), which is defined as a persistent pain around the puncture site without radicular pain, is a common consequence following spinal anaesthesia and some studies reported that in the adult population, the incidence of low back pain after spinal anaesthesia is similar to that after general anaesthesia **[10].**

Back pain following anaesthesia may be attributed to ligament, fascia, or bone injuries with localized bleeding; rigidity of the spine; anaesthesia-induced relaxation of the paraspinal muscles; flattening of the typical lumbar convexity; and stretching and straining of the lumbosacral ligaments and joint capsules **[10].**

METHODS

Study design: Retrospective Cohort Study was done in South Valley University Teaching Hospitals, (2021). The procedures confirmed by the International Ethical Committee Clearance of the Faculty of Physical Therapy at Cairo University and were registered on Clinical Trials gov.

Study population: Thirty-eight women participated in this study; Their ages were between 18 and 35 year-olds with body mass index (BMI) not more than 30 and waist to hip ratio not more than 1.

Except 12 of them who were the control group (no previous pregnancy or anaesthesia) the other 26women gave birth through a cesarean delivery, they were either primiparous or multiparous have not had anaesthesia (epidural, spinal or general) for at least one year prior to the

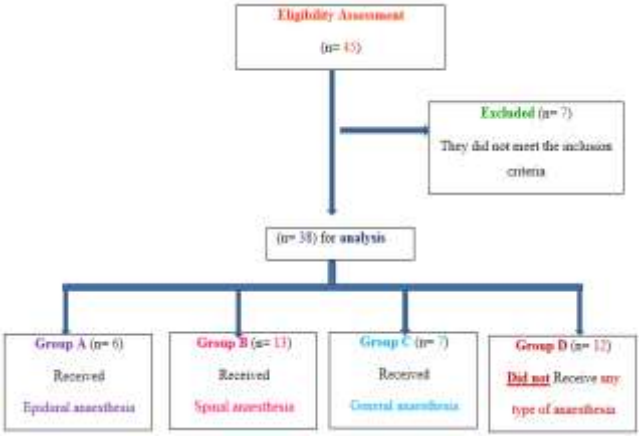
last obstetric anaesthesia ,assessment of low back pain intensity was between the 6th week to the 12th week postnatal. We excluded women who delivered through vaginal delivery, Women who delivered with the use of paramedian approach of neuraxial anaesthesia and any woman complained of previous non-myofascial low back dysfunctions as women who were diagnosed with lumbar disc prolapse or spondylolisthesis.

MATERIALS FOR EVALUATION:

-Visual analogue scale (VAS): It was used to measure low back pain intensity in women in all groups.

The reliability of the VAS for disability is moderate to good [11]. It is an interval scale investigated by many studies in which most of their findings showed that it is a valid and reliable scale [12].Scores are recorded by making a handwritten mark on a 10-cm line that represents a continuum between “no pain” and “worst pain.” [13].

Flow chart of the study:



Data collection: Data were screened, for normality assumption test and homogeneity of variance. Normality test of data using Shapiro-Wilk test was used, that reflect the data was normally distributed (P>0.05) after removal outliers that detected by box and whiskers plots. Additionally, Levene's test for testing the homogeneity of variance revealed that there was no significant difference (P>0.05). So, the data are normally distributed and parametric analysis is done.

Statistical analysis: The statistical analysis was conducted by using the statistical SPSS Package program version25 for Windows (SPSS, Inc., Chicago, IL). Data are expressed as the mean and standard deviation for age, BMI, Postpartum duration (PPD)/week, parity/child, and VAS variables. One-way analysis of variance (ANOVA-test) to compare among 4 groups : epidural anaesthesia group (Group A), spinal anaesthesia group (Group B), general anaesthesia group (Group C), and control group (Group D) for age, BMI, PPD/week, parity/child, and VAS variables. Bonferroni correction test was used to compare pairwise between groups for VAS variable which P-value was significant from ANOVA- test. All statistical analyses were significant at probability ($P \leq 0.05$).

RESULTS

In the current study, a total of 38 patients participated and they were classified into three groups according to the type of anaesthesia and the fourth group was the control group who did not have previous pregnancy or receive any type of anaesthesia. No significant differences in age (P=0.925; P>0.05) and BMI (P=0.059; P>0.05), but there were significant differences in both Postpartum duration (PPD)/week, (P=0.0001; P<0.05) and parity/child (P=0.0001; P<0.05) among the four groups and these significant differences were because of the presence of the control group who did not have any previous pregnancyor postpartum duration (Table 1).

The mean values of VAS in epidural anaesthesia group (Group A), spinal anaesthesia group (Group B), general anaesthesia group (Group C), and control group (Group D) were 5.00 ±1.67, 4.62 ±1.12, 5.14 ±1.21, and 2.17 ±0.71, respectively. The statistical analysis by ANOVA test revealed that there was significant difference in VAS (P=0.0001; P<0.05) among groups A, B, C, and D (Table 2).

Post-hoc test (Bonferroni test) and mean difference for VAS between pairwise of the groups (Table 3). There were significant differences (P=0.0001; P<0.05) in VAS between group A versus group D, group B versus group D, and group C versus group D, but no significant differences (P=1.000; P>0.05) between group A versus group B, group A versus group C, and group B versus group C. Bonferroni test and mean differences between groups showed that the spinal anaesthesia group (Group B) gave the lowest mean differences response of VAS (MD=2.44), followed by epidural anaesthesia group (Group A; MD=2.83), and then general anaesthesia group (Group C; MD=2.97) compared to the control group (Group D).

TABLES

Table 1: Comparison of general characteristics among the 4 groups

Items	Groups				P-value
	Group A (n=6)	Group B (n=13)	Group C (n=7)	Group D (n=12)	
Age (year)	23.50 ±3.72	23.62 ±4.07	24.86 ±7.17	23.92 ±1.78	0.925
BMI (Kg/cm^2)	26.60 ±1.98	24.63 ±3.26	27.37 ±2.18	23.52 ±3.89	0.059
PPD/week	7.33 ±0.51	8.08 ±2.21	8.43 ±1.81	0.00 ±0.00	0.0001*
Parity/child	1.33 ±0.51	2.15 ±1.06	2.57 ±1.71	0.00 ±0.00	0.0001*

Group A: Epidural anaesthesia group; Group B: Spinal anaesthesia group; Group C: General anaesthesia group; Group D: Control group,
Data are expressed as mean ±standard deviation (SD)
P-value: probability value; P-value>0.05:non-significant;*Significant (P<0.05)

Table 2: Comparison of VAS among the 4 groups

Items	Groups				P-value
	Group A (n=6)	Group B (n=13)	Group C (n=7)	Group D (n=12)	
VAS	5.00 ±1.67	4.62 ±1.12	5.14 ±1.21	2.17 ±0.71	0.0001*

Epidural anaethesia group; Group B: Spinal anaethesia group; Group C: General anaethesia group; Group D: Control group
Data are expressed as mean ±standard deviation (SD)
P-value: probability value; P-value>0.05: non-significant; * Significant (P<0.05)

Table 3: Post-hoc test (Bonferroni test) of VAS between pairwise of groups

Variabel	Items	Post-hoc (Bonferroni test)		
		Mean difference (MD)	95% CI	P-value
VAS	Group A vs. Group B	0.38	-1.18 – 1.95	1.000
	Group A vs. Group C	0.14	-1.91 – 1.62	1.000
	Group A vs. Group D	2.83	1.25 – 4.42	0.0001*
	Group B vs. Group C	0.52	-2.01 – 0.96	1.000
	Group B vs. Group D	2.44	1.18 – 3.72	0.0001*
	Group C vs. Group D	2.97	1.47 – 4.49	0.0001*

Group A: Epidural anaesthesia group; Group B: Spinal anaesthesia group; Group C: General anaesthesia group; Group D: Control group
CI: confidence interval; P-value: probability value; P-value>0.05: non-significant.
* Significant (P<0.05)

DISCUSSION

When comparing post-partum women who had a caesarean section to those who had a normal vaginal delivery, the prevalence of lower backache is higher **[14].**This study is the first study that assess and compare the intensity of subacute low back pain in women who underwent cesarean delivery after the 6th week to the 12th week postnatal with different anaesthetic types and compare it to the control group who did not have any previous pregnancy or any type of anaesthesia to investigate the difference in subacute low back pain intensity among different anaesthetic types.

Our findings showed significant differences between the mean values of VAS that reflect the intensity of subacute low back pain in all women underwent cesarean delivery whatever the type of anaesthesia (Epidural, Spinal and General) compared to the control group who did not have any previous pregnancy or any type of anaesthesia and these finding sthat revealed that there was a significance in the mean difference of VAS between the group of cesarean delivery with epidural anaesthesia and the control group comes in agreement with **Chia et al., [15]** who concluded that cesarean section with epidural anaesthesia might raise the risk of subsequent low backache compared to normal labor. Also, another study by **Macarthur and colleagues., [16]** concluded that the relation between back pain and epidural anaesthesia is most likely causal. It appears to result from a combination of impact of analgesia and stressful labor posture.

We found that there was a significance in the mean difference of VAS between the group of cesarean delivery with spinal anaesthesia and the control group with the VAS score of spinal anaesthetic group was 4.62 (moderate pain intensity) comes in agreement with the study of **Tariq et al., [17]** who revealed that 78% of housewives complained of low backache after cesarean delivery under spinal anesthesia with 44.9% of them had moderate intensity pain.

Also, we found that there was no significance in the mean of VAS scores between the group of cesarean delivery with spinal anaesthesia and the general anaesthesia group and this was supported by the study of **Standl et al., [18]** who concluded that the incidence of low back pain after spinal anaesthesia and general anaesthesia has been observed to be similar.

Our results also showed that there were no significant differences in the mean of VAS between the anaesthetic groups (epidural, spinal and general) and these findings were supported by **Benzon et al., [10]** who concluded in their review that the use of neuraxial anaesthesia (spinal or epidural anaesthesia) in the adult, non-obstetric, and obstetric populations should be based on the benefits of the technique rather than the occurrence of back pain following the procedure, as back pain following neuraxial anaesthesia in the adult population is similar to that following general anaesthesia.

On the other hand, we found there was subacute low back pain that lasted 6-12weeks after cesarean delivery in the neuraxial groups which is contradicted to the findings of **Chan., [19]** who found that pain was limited to the injection site, mild to moderate in intensity, and only lasted up to four days.

Another contradicted study to our findings was done by **Malevic et al., [20]** who concluded that the labor pain anaesthetic techniques(epidural and general anaesthesia) did not cause the increased risk of low back pain in the early postnatal period and after six months of delivery.

Further studies with larger sample size and objective methods to assess pain and biomechanical function of the low back are needed to ensure our statistical findings.

CONCLUSION

It can be concluded that Cesarean delivery with different anaesthetic types such as epidural, spinal and general anaesthesia was associated with subacute low back pain without significant differences in pain intensity between these different types of anaesthesia but the subacute low back pain intensity the spinal anaesthetic group was the lowest followed by epidural anaesthetic group and then general anaesthetic group.

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Conflict of interest: The authors declare that they do not have any conflict of interest**.**

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