

## **HEADACHE AFTER EPIDURAL ANESTHESIA IN PREGNANT WOMEN AND ASSESSMENT OF QUALITY OF LIFE**

**Dr. Ketam Ibrahim Nasser**

M.B.Ch.B., C.A.B.O.G. \ (Obstetrics & Gynecology)

Iraqi Ministry of Health, Babylon Health Directorate, Al-Mahaweel General Hospital, Babylon,  
Iraq.

drdr92396@gmail.com

**Dr. Batool Mushrif Mahmood**

M.B.Ch.B., D.O.G. \ (Obstetrics & Gynecology)

Iraqi Ministry of Health, Baghdad Health Directorate Al-Karkh, Altarmia General Hospital,  
Baghdad, Iraq.

Batoolmushrof3@gmail.com

**Dr. Muhammed Ali Kareem Radhi**

M.B.Ch.B., FETP

Iraqi Ministry of Health, Baghdad Health Directorate, Al-Karkh, Al-Karkh Maternity Hospital,  
Baghdad. Iraq.

Makimakmak77@gmail.com

### **Abstract**

This study sought to evaluate the clinical results of epidural procedures on headaches in pregnant women and their overall quality of life. The research utilized a cross-sectional design and collected clinical data from pregnant women aged between 25 and 40 years. The study specifically examined the outcomes related to headaches both before and after undergoing surgical procedures with epidural anesthesia. The investigation encompassed various aspects, including preoperative headaches, migraines, headaches during pregnancy, headaches within 60 hours of delivery, and headaches at six weeks post-surgery. To measure the severity of postoperative headaches, the researchers employed the Visual Analog Scale (VAS), which ranges from 0 to 10. A score of 0 represents no pain, while a score of 10 indicates severe pain. Furthermore, this study also evaluated the quality of life of pregnant women who underwent the operation.

A comprehensive study was carried out in Iraq to assess the impact of epidural anesthesia on pregnant women, as well as the intensity of postpartum headaches and the overall well-being of these individuals. The participants of this study were specifically limited to women between the ages of 25 and 40, who were then categorized into two groups based on their delivery method (37 [35.24%] underwent a Caesarean section, while 68 [64.76%] had a vaginal delivery).

Postpartum complications included blood pressure imbalances, aggravated headaches, and a decline in the quality of life. The following findings were obtained during the study:

1. 24 hours after the procedure: an average score of  $66.6 \pm 20.2$
2. One week after the procedure: an average score of  $80.11 \pm 10.1$
3. One month after the procedure: an average score of  $83.3 \pm 10.1$

Moreover, the severity of the participants' headaches was assessed using the numeric rating scale (NRS), which revealed that increased headache severity was among the identified complications in this investigation.

**Key words:** *Headache; Epidural anesthesia; VAS scale; Blood pressure; Quality-life.*

### **Introduction**

Epidural anesthesia offers several benefits which provides profound and long-lasting analgesia while preserving other sensory and motor functions that can allow for early patient mobilization and reducing the risk of complications such as thromboembolism and respiratory issues and can manage of inpatient pain relief; epidurals can decrease opiate consumption and reduce the risk of adverse cardiorespiratory outcomes. Also, epidural anesthesia provides better pain relief, less sedation [1,2,3], and overall patient satisfaction, aiding in faster recovery and symptom relief for women undergoing uterine artery embolization as well. As epidural anesthesia has been found to provide hemodynamic stability during anesthesia induction and postoperative pain reduction which, it can continuous epidural anesthesia has been shown to effectively control pain in pregnant women with uterine myomas while also suppressing uterine contractions and improving blood flow to the affected areas. [4,5,6,7]

The use of epidurals provides excellent analgesia for labor and surgical delivery, resulting in higher quality pain relief compared to other alternatives but complications associated with neuraxial techniques, such as epidural hematoma, can occur, although they are rare where the benefits of epidural anesthesia[8,9,10,11], including reduced mortality during cesarean section and improved patient care which outweigh the potential complications therefore epidural anesthesia can help suppress uterine contractions and improve blood flow to the uterus, making it a suitable method of pain control for women with uterine myomas in mid-pregnancy as well as It has been found to stabilize hemodynamics, improve hormone levels, and lower the incidence of adverse reactions in women with gestational diabetes mellitus (GDM) undergoing cesarean delivery where both of General anesthesia combined with epidural anesthesia has been found to result in shorter recovery times and improved postoperative cognitive functions in pregnant women with dystocia. [12,13,14,15]

Unintentional dural puncture during epidural anesthesia in pregnant women can lead to chronic disabling headaches, affecting the quality of life. Studies have shown that the prevalence of disabling headache is higher among women who experienced unintentional dural puncture compared to those who received uncomplicated neuraxial anesthesia where post-dural puncture headache (PDPH) is a common and about consequence after lumbar puncture, and its prevalence is greater in pregnant women, also, Migraine, which worsens during pregnancy, can also contribute to the occurrence of headaches in the postpartum period therefore epidural blood patch (EBP) has

been used as a treatment for post-dural puncture headache (PDPH) that does not respond to medical therapy. [16,17,18]

Epidural anesthesia in pregnant women can have various effects on headaches, which cause fluctuations in reproductive hormones during pregnancy, can worsen migraines, and the administration of epidural anesthesia can increase the occurrence of headaches and. Headache can also occur immediately after epidural anesthesia and may be attributed to intracranial hypotension due to leakage of cerebrospinal fluid, where it considers post-dural puncture headache (PDPH) as a common complication of neuroaxial anesthesia, including epidural anesthesia, and can be treated with an epidural blood patch, also accidental dural puncture during attempted epidural procedures can lead to post-dural puncture headache (PDPH) in obstetric patients, which can be severe and long-lasting, with potentially life-threatening complications. [19,20,21,22]

## **Patients and methods**

### **Study design**

The study delineated herein is a cross-sectional exploration of clinical data acquired from a cohort of 105 pregnant women aged between 25 and 40 years. The primary focus of the investigation was to assess the impact of epidural anesthesia on the incidence of headaches in the studied population. The key parameters considered included age, body mass index, presence of comorbidities, smoking status, and economic factors.

The data was further segregated based on the type of delivery - cesarean section or vaginal delivery. Several variables were considered during this segregation, including gestational age, gestational weight, birth weight, pre-and post-operative hemoglobin concentrations, duration of anesthesia, estimated blood loss, and blood transfusion data. The study also ventured into the management details of the epidural anesthesia administered during childbirth, primarily focusing on the quantity of anesthesia introduced at the time of the procedure.

The intraoperative heart rate of the patients, which fluctuated between 60 and 100 beats per minute, was also analyzed. The study incorporated measurements of estimated blood pressure and blood transfusion rates during both cesarean sections and vaginal deliveries. The study yielded significant insights into the incidence of headaches in pregnant women, both preoperatively and postoperatively, under epidural anesthesia. Factors such as preoperative headaches, migraines, headaches experienced during pregnancy, headaches within 60 hours of delivery, and headaches at six weeks postpartum were evaluated. The intensity of the postoperative headaches was quantified using the Visual Analogue Scale (VAS), with 0 indicating the absence of pain and 10 signifying severe pain. Furthermore, the study evaluated the quality of life of the patients following the operation.

### **Participants**

The study recruited 105 patients from different hospitals in Iraq over a period from August 15<sup>th</sup>, 2022, to October 18<sup>th</sup>, 2023. The data highlighted the rate of women who experienced preoperative and postoperative headaches, underscoring the potential negative complications associated with epidural anesthesia.

### **Statistical analysis**

The study group comprised pregnant women who underwent cesarean sections or vaginal deliveries under epidural anesthesia. The study notably excluded women under the age of 25 or

over the age of 40, those diagnosed with severe ailments such as cancer, diabetes, or incurable heart disease, and those with a history of surgical procedures. The clinical data and postoperative quality of life assessments were analyzed using the Statistical Package for the Social Sciences (SPSS), version 22.0.

## Results

**Table 1:** Demographic characteristics of pregnant women.

| Characteristics               | Number of patients | [%]    |
|-------------------------------|--------------------|--------|
| <b>Women age</b>              |                    |        |
| 25-29                         | 23                 | 21.90% |
| 30-34                         | 47                 | 44.76% |
| 35-40                         | 35                 | 33.33% |
| <b>BMI [kg/m<sup>2</sup>]</b> |                    |        |
| < 28.40                       | 40                 | 38.10% |
| > 28.40                       | 65                 | 61.90% |
| <b>Comorbidities</b>          |                    |        |
| Hypertension                  | 37                 | 35.24% |
| Rheumatic heart disease       | 16                 | 15.24% |
| Hypothyroidism                | 19                 | 18.10% |
| Anaemia                       | 26                 | 24.76% |
| Others                        | 7                  | 6.67%  |
| <b>Smoking</b>                |                    |        |
| Smokers                       | 14                 | 13.33% |
| Non-smokers                   | 91                 | 86.67% |
| <b>Economic level</b>         |                    |        |
| 400 \$                        | 21                 | 20.0%  |
| 700\$                         | 48                 | 45.71% |
| 1500\$                        | 36                 | 34.29% |

**Table 2:** Baseline mode of delivery management associated with pregnant women outcomes.

| Variables                           | Pregnant women Outcomes |
|-------------------------------------|-------------------------|
| Gestational age (week), [mean ± SD] | 36.9 ± 0.8              |
| <b>Brith weight [Kg], N [%]</b>     |                         |
| 1.7 – 2 ½                           | 30 [28.57%]             |
| 2.5 - 3                             | 60 [57.14%]             |

> 3 15 [14.29%]

**Mode of delivery**

Caesarean section 37 [35.24%]

Vaginal delivery 68 [64.76%]

**Operative time [min]**

Caesarean section minutes [mean  $\pm$  SD] 52.64  $\pm$  8.82

Vaginal delivery, minutes [mean  $\pm$  SD] 230  $\pm$  10

**Haemoglobin concentration (g/L), [mean  $\pm$  SD]**

Pre-operative 106.90  $\pm$  16.73

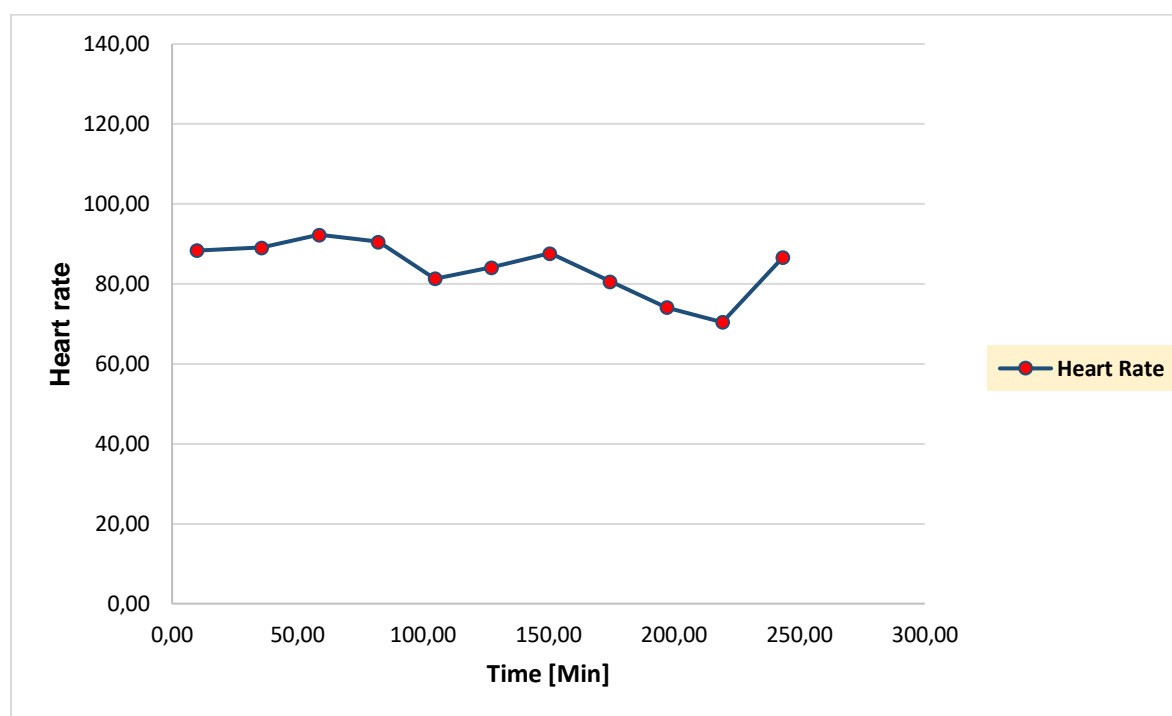
Post-operative 100.52  $\pm$  16.10

**Anesthesia- to-delivery time [min]** 30.22  $\pm$  3.11

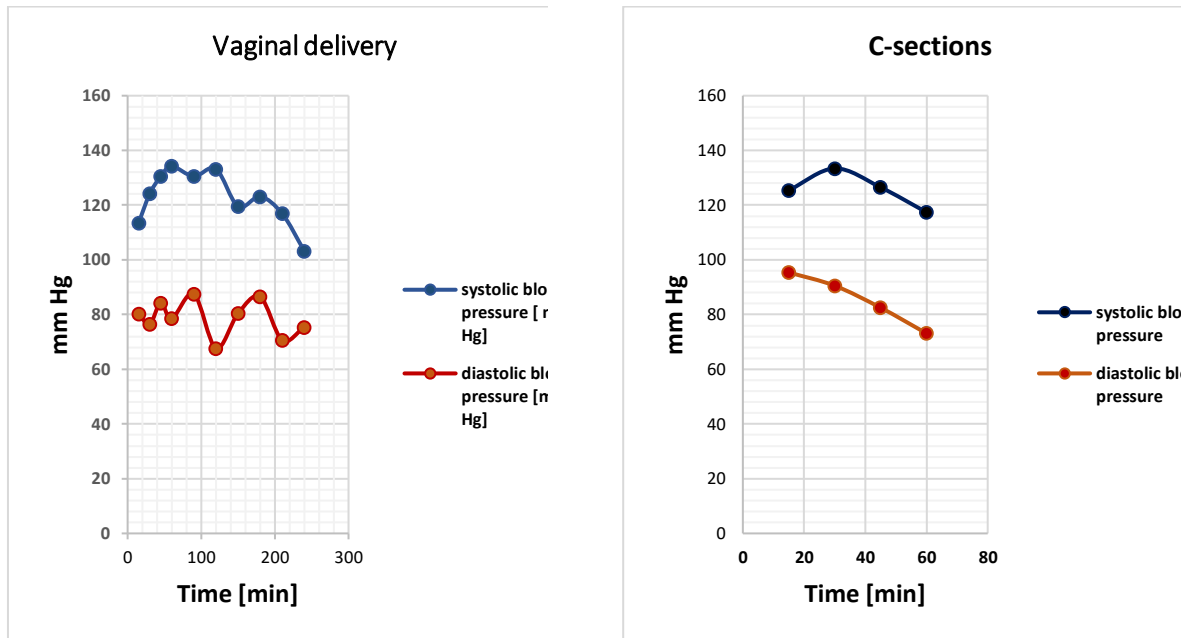
**Intraoperative-Blood- delivery**

Estimated blood loss (ML), [mean  $\pm$  SD] 557.42  $\pm$  43.81

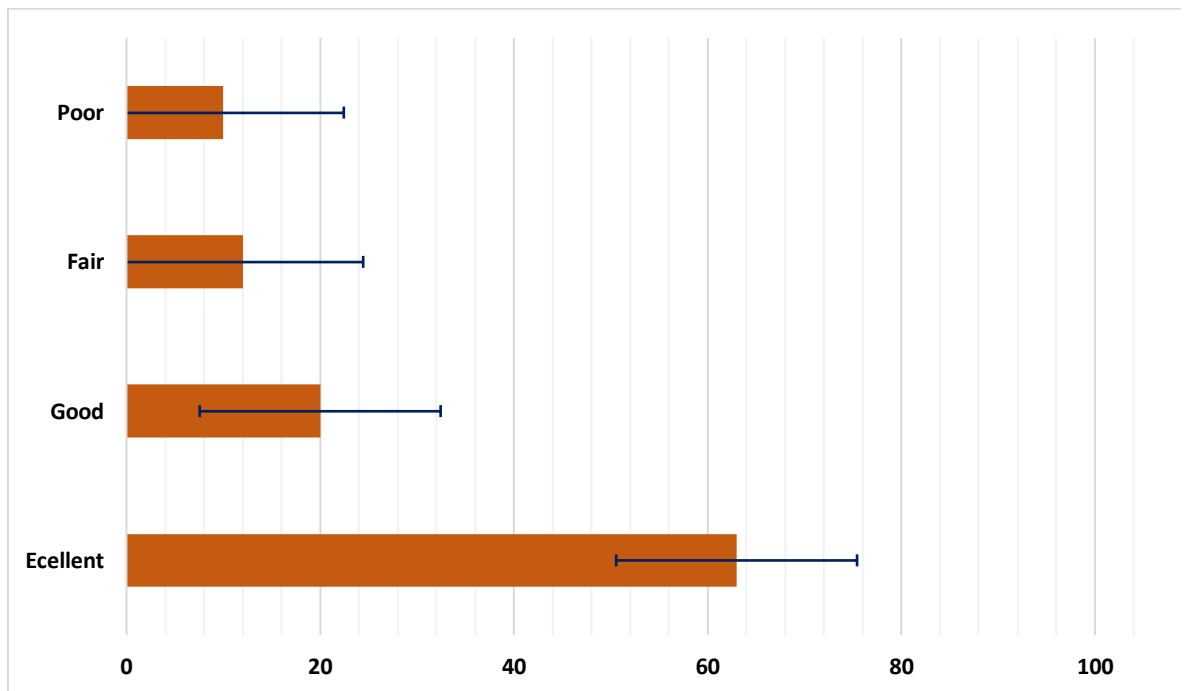
Blood transfusion, N [%] 12 [11.43%]



**Figure 1:** Determine of heart rate for pregnant women.



**Figure 2:** Measure intraoperative blood pressure of pregnant women.



**Figure 3:** Satisfaction rate of post-operative pregnant women.

**Table 4:** Headache outcomes associated to pregnant women outcomes before and after operative under epidural anesthesia.

| Variables | Number of patients [105] | [%] |
|-----------|--------------------------|-----|
|-----------|--------------------------|-----|

|                                      |    |       |
|--------------------------------------|----|-------|
| Preoperative headache                | 30 | 28.57 |
| Migraine                             | 15 | 14.29 |
| Headache during pregnancy            | 10 | 9.52  |
| Headache within 60 hours of delivery | 8  | 7.62  |
| Headache at six weeks                | 42 | 40.0  |

**Table 5-Evaluating the quality of life of pregnant women after epidural anesthesia groups. EQ-VAS score**

| Time-lapse                    | epidural anesthesia group Mean (SD) |
|-------------------------------|-------------------------------------|
| Before operation              | 79.59 ± 12.11                       |
| 24 hours after the operation  | 66.6± 20.2                          |
| One week after the operation  | 80.11 ± 10.1                        |
| One month after the operation | 83.3 ± 10.1                         |

**Table 6- Outcomes of patients Headache according to numeric rating scale (NRS)**

|                              | Mild | Moderate | Severe |
|------------------------------|------|----------|--------|
| <i>Character of headache</i> |      |          |        |
| Caesarean delivery           | 7    | 20       | 10     |
| Vaginal delivery             | 18   | 30       | 11     |
| <i>Location of headache</i>  |      |          |        |
| Holocranial                  | 10   | 19       | 9      |
| Frontal                      | 11   | 21       | 6      |
| Frontotemporal               | 4    | 10       | 6      |

### Discussion

Study data were collected for 105 pregnant women patients. This study found that pregnant women aged 30-34 years had the highest rate of undergoing surgery, with a body mass index > 28.40, including 65 cases. Regarding comorbidities, this study recorded that the rate of pregnant women with high blood pressure was the highest, with 37 cases, followed by anemia, with 26 cases. Clinical results showed that the percentage of pregnant women who smoked was 13.33%. This study recorded the clinical data of pregnant women in the management of the delivery method in terms of gestational age ( $36.9 \pm 0.8$ ) and birth weight (2.5 - 3) kg, which was the highest percentage.

The clinical data also included the method of delivery, as vaginal delivery included 68 cases with a duration of ( $230 \pm 10$ ) minutes, while cesarean section included 37 cases with a duration of ( $52.64 \pm 8.82$ ) minutes. The hemoglobin concentration of patients before the operation was ( $106.90 \pm 16.73$ ) (g/g). L) while after the operation, it was ( $100.52 \pm 16.10$ ) (g/L), and the estimated blood

loss (ML) was ( $557.42 \pm 43.81$ ), as blood transfusion for pregnant women included 12 cases. The clinical results were determined, which diagnosed the heart rate during the operation, which recorded stability in the heart rate between (70 - 100) beats within 300 minutes. Also, the blood pressure rate of pregnant women was examined, which revealed a significant variation during the operation.

The postoperative results for headache after epidural anesthesia showed that the patients' data recorded headaches before surgery was 30, migraine was 15, headache during pregnancy was 10 cases, Headache within 60 hours of delivery was 8 cases, and headache at six weeks was 42 cases.

The presence of hypertension is associated with the largest independent association with secondary headache, which is likely driven by preeclampsia and related disorders. Furthermore, the absence of a history of headaches also confers a strong independent risk. It is worth noting that a referable abnormal neurological examination is frequently present in patients with secondary headaches, although it is not an independent risk factor. This is partly due to the frequent occurrence of sensory abnormalities in migraine with aura. Moreover, it is important to consider that neurological abnormalities are likely to be associated with hypertension and headache history, which reduces their influence in the final model. Lastly, it is expected that the presence of a psychiatric diagnosis is independently associated with a diagnosis of primary headache, given the psychiatric morbidity associated with migraine.

The incidence of CPPD in obstetrics with spinal needles, as reported in the literature, varies from 0 to 36%. This variation depends on the type and size of the needle used (3, 4, 5). For beveled spinal needles, the reported incidence is 36% for 22 G gauge, ranging from 3 to 25% for caliber 25 G and 1.5 to 5.6% for caliber 27 G. However, when using atraumatic needles, the incidence is reduced. It ranges from 0 to 4.7% with caliber 25 G and from 0 to 1.6% with caliber 27 G (3, 4, 5). In our study, 98% of the needles used were pencil-point. Therefore, we propose that an incidence of PDPH of 2.6% (24 cases) is comparable to the data found in the literature. It is worth noting that we did not find a statistically significant difference in the incidence of PDPH between the 25 G and 27 G measures. However, it is important to acknowledge that our study has a limitation, which is the low number of patients in whom the 27 G gauge was used (11, 2%).

Out of the 24 cases of CPPD, only 1 (4.2%) was classified as severe, 29.2% (7 cases) were moderate, and 50.0% (12 cases) were mild. Regarding the associated factors...

### **Conclusion**

We conclude from this study on the effect of epidural anesthesia on pregnant women as a direct relationship was found to be proportional to the severity of headaches in pregnant women, in addition to a decrease in their quality of life.



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