

## Study to determine the treatments used to relieve postpartum pain

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**Annotation. Background** Postpartum pain was a typical issue after a vaginal delivery, which not only affects the woman's physical and mental functioning but also reduces the ability of the mother to care for her new infant, mobility, urine, and fecal incontinence. **Objective** Our study greatly contributed to assess and analyse clinical outcomes of ibuprofen and acetaminophen to relieve postpartum pain. **Patients and methods** We recruited 90 women who underwent childbirth and collected all clinical data from hospitals and maternity centers in different hospitals in Iraq during the study period, which extended from April 6, 2022, to August 18, 2023. The women's data was divided into two groups where the first group represented women who took ibuprofen, which included 45 women, and the second group included women who took acetaminophen, which included 45 women. Furthermore, we determined and evaluated the rate of postpartum pain within four hours after receiving treatment. Also, we identified side effects for both groups who underwent postpartum treatment and also evaluated the quality of life of the women during the postpartum period. **Results** in Our study were shown maternal characteristics outcomes, where gestational age was  $267.89 \pm 5.32$  days in the Ibuprofen group and  $270.86 \pm 3.24$  in the Acetaminophen group, Cesarean section was 18 cases, and Vaginal delivery was 72 cases in the Ibuprofen group, but Cesarean section was 23 cases and Vaginal delivery was 67 cases in Acetaminophen group, singleton pregnancy was 43 cases and twin pregnancy was 2 in Ibuprofen group, while singleton pregnancy was 44 cases and twin pregnancy was 1 in Acetaminophen group. According to pain control and satisfaction rating, we enrolled pain rate before taking treatments of the Ibuprofen group was  $5.73 \pm 1.87$  and the Acetaminophen group was  $6.88 \pm 1.24$ , while the pain rating one h after taking treatments was  $2.42 \pm 1.38$ , after 2 hours was  $1.54 \pm 1.26$ , after 3 hours was  $1.05 \pm 0.78$ , after 4 hours was  $0.65 \pm 0.65$ , while one h after was  $2.94 \pm 1.89$ , 2 h after was  $1.97 \pm 1.80$ , 3 h after was  $1.36 \pm 1.40$ , 4 h after was  $1.02 \pm 0.33$  in Acetaminophen group. For satisfaction rate of the Ibuprofen group included excellent with 32 cases, good with 10 cases, fair with 2 cases, and poor with 1 case, while the satisfaction rate of the Acetaminophen group included excellent with 28 cases, good with 13 cases, fair with 3 cases, poor with 1 case. **Conclusion** Ibuprofen and acetaminophen are treatments who more effective and safer to pain relievers of postpartum care for women after childbirth.

Based on this, it is of considerable scientific and practical interest to study the immunological mechanisms of inflammation in COPD and the comorbid course of COPD and COVID-19 with pneumonia.

**Keywords** Ibuprofen; Acetaminophen; Quality of life; Postpartum pain; Complications.

### Introduction

Childbirth is a deeply emotional experience and includes the creation of bonds with the R.N. and the beginning of breastfeeding, vaginal postpartum, or caesarean section [1]. It is accompanied by pain secondary to perineal trauma (vaginal delivery) or surgical intervention. In the case of caesarean section, the pain relief will make the post-anesthesia period less uncomfortable, favouring the mother-child

relationship. [2]

Perineal trauma is caused by tears, by perineotomy, or by both and can be accompanied by pain of varying intensity since it originates in somatic structures [3]. The degree of perineal pain and discomfort associated with trauma is often underestimated. Pain often interferes with basic daily activities, such as walking, sitting, and urinating, and has a negative impact on the experiences of motherhood. [4,5]

The post-surgical pain of cesarean section comprises somatic and visceral structures, and usually its extent and magnitude are greater than the pain of vaginal childbirth [6]. The postoperative pain management of cesarean section is similar to that of any abdominal surgery, with the exception that the passage of drugs from the mother to the RN through milk must be considered. [7]

Childbirth and postpartum hemorrhage are one of the main and most important obstetric emergencies, being the main cause of admission to intensive care units of pregnant and recent postpartum patients. [8]

The International Federation of Gynecology and Obstetrics (FIGO) and the World Health Organization (WHO) are active in promoting the prevention of maternal-fetal morbidity and mortality secondary to postpartum hemorrhages [9]. Risk factor study protocols and informed consents have been developed, all based on evidence-based medicine and considering the opinions of experts [10]. Access to diagnostic methods, therapeutic elements, trained medical personnel, nutritional and health conditions of the population, and access to qualified health centers. [11]

Postpartum hemorrhages are still an important cause of Maternal Mortality (MM) [11]. According to the WHO [12 -14], in 2020, severe hemorrhages occupied the first place among the causes of MM worldwide, accounting for 30% of total maternal deaths, regardless of the level of development and/or per capita income of each country. [15] Although 99% of these deaths occurred in developing countries, it is important to highlight the importance of this complication, both for its magnitude and for the existence of currently available tools to avoid or minimize its occurrence [15 – 17]. On the other hand, according to FIGO, the maternal mortality rate due to postpartum hemorrhages, which varies from 30% to rates higher than 50% in different countries, also accounts for this reality [18,19]. The goal set for 2015 is to reduce maternal mortality due to postpartum hemorrhage by 75% with appropriate prevention and treatment measures. [20]

### **Patients and methods**

We conducted a comprehensive systematic study of 90 samples of women who underwent childbirth, collecting all clinical and demographic data from hospitals and maternity centers in different hospitals in Iraq within the study period, which extended from April 6, 2022, to August 18, 2023. This data included age, body mass index, and comorbidities: smoking status, education level, and employment status.

Also, this study recorded data related to the characteristics of pregnant women, which included gestational age, birth weight ( $< 2.5$ ,  $2.5 - 3.9$ ,  $\geq 4$ ), method of delivery (cesarean section, vaginal delivery), place of birth (hospitals, birth centers), number of pregnancies, and type of pregnancy. According to postpartum women's data, all patients reported postpartum pain. Based on pain control and satisfaction assessment, all women were given a dose of acetaminophen and ibuprofen, which was given between 4-6 hours. The dose of acetaminophen was given to women at a dose of 500 mg, while the dose of ibuprofen was added to women at 400 mg to improve the patient's pain rate.

As a result, the women were divided into two groups where the first group represented women who received ibuprofen, which included 45 women, and the second group included women who received acetaminophen, which included 45 women. In addition, we determined and evaluated the rate of postpartum pain within four hours after receiving treatment, and we also distributed all samples according to satisfaction rates, which determined the quality of patient satisfaction with the hospital in managing patients, which was classified within criteria that included excellent, good, fearful, and poor. In addition, we identified side

effects for both groups who underwent postpartum treatment. We also evaluated the quality of life for women during the postpartum period, as these criteria included the physical aspect, the psychological aspect, the emotional and social aspects, and the aspect of daily activity. The study methodology for women's data was designed and analyzed using the SPSES program, version 22.

## Results

**Table 1:** Clinical and demographic characteristics outcomes of women.

Characteristics	Number of patients [90]	Percentage [%]
Age		
25 – 29	14	15.56%
30 – 34	24	26.67%
35 – 39	22	24.44%
40 – 45	30	33.33%
BMI, [Kg/m <sup>2</sup> ]		
Underweight	4	4.44%
Normal weight	25	27.78%
Overweight	30	33.33%
Obesity	31	34.44%
Comorbidities		
Yes	36	40%
No	54	60%
Hypertension	30	33.33%
Obesity	33	36.67%
Diabetes	12	13.33%
Kidney diseases	4	4.44%
Thyroid disorders	2	2.22%
Asthma	4	4.44%
Heart disease	2	2.22%
Smoking status		
Yes	4	4.44%
No	86	95.56%
Education level		
Primary	12	13.33%
Secondary	20	22.22%
College/university	58	64.44%
Employment status		
Employed	42	46.67%
Unemployed	48	53.33%

**Table 2:** Maternal characteristics outcomes.

Variables	Ibuprofen [45]	Acetaminophen [45]
Gestational age, days	267.89 ± 5.32	270.86 ± 3.24
Birth weight (Kg)		
< 2.5	4 (4.44%)	5 (5.56%)
2.5 - 3.9	78 (86.67%)	75 (83.33%)
≥ 4	8 (8.89%)	10 (11.11%)
Mode of delivery		
Cesarean section	18 (20%)	23 (25.56%)
Vaginal delivery	72 (80%)	67 (74.44%)
Place of birth		
Health facilities	45 (100%)	45 (100%)
Number of pregnancies		
0	28 (62.22%)	25 (55.56%)
1	10 (11.11%)	12 (13.33%)
2	5 (5.56%)	6 (6.67%)
≥ 3	2 (2.22%)	2 (2.22%)
Type of pregnancy		
Singleton	43 (95.56%)	44 (97.78%)
Twin	2 (2.22%)	1 (1.11%)

**Table 3:** Prepartum and postpartum outcomes.

Variables	Ibuprofen [45]	Acetaminophen [45]
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<b>Prepartum data</b>		
Chronic hypertension requiring treatment, n (%)	8 (17.78%)	7 (15.56%)
Need for IV antihypertensives before delivery	30 (66.67%)	34 (75.56%)
Maximum SBP before delivery, mean (SD)	182.8 ± 14.3	184.24 ± 12.52
Maximum DBP before delivery, mean (SD)	108.34 ± 10.81	105.23 ± 10.47
<b>Postpartum data</b>		
Maximum postpartum SBP, mean (SD)	105.4 ± 6.7	107.84 ± 7.24
Maximum postpartum DBP, mean (SD)	72.94 ± 3.30	80.53 ± 2.6
Postpartum ≥ BP 160/110 mm Hg	5 [11.11%]	6 (13.33%)
Postpartum stay, day, mean (SD)	3.7 ± 1.6	4.2 ± 1.4
Postpartum stay extended for BP control, n (%)	2 (4.44%)	4 (8.89%)
Maternal death		
Died	0 (0%)	0 (0%)
Alive	45 (100%)	45 (100%)

**Table 4:** Pain control and satisfaction rating.

Variables	Ibuprofen [45]	Acetaminophen [45]
<b>Pain control</b>		
Before taking treatments	5.73 ± 1.87	6.88 ± 1.24
1 h after taking treatments	2.42 ± 1.38	2.94 ± 1.89
2 h after taking treatments	1.54 ± 1.26	1.97 ± 1.80

3 h after taking treatments	1.05 ± 0.78	1.36 ± 1.40
4 h after taking treatments	0.65 ± 0.65	1.02 ± 0.33
<b>Satisfaction rating</b>		
Excellent	32 (71.11%)	28 (62.22%)
Good	10 (22.22%)	13 (28.89%)
Fear	2 (4.44%)	3 (6.67%)
Poor	1 (2.22%)	1 (2.22%)

<b>Table 5:</b> Determining side effects for both groups who underwent treatment in postpartum.			
Factors	Ibuprofen [45]	Acetaminophen [45]	- v a l u e
Nausea	3 (6.67%)	3 (6.67%)	. 0 5
Vomiting	2 (4.44%)	1 (2.22%)	. 0 5
Stomach pain	1 (2.22%)	2 (4.44%)	0 .0 1
Indigestion	0 (0%)	0 (0%)	. 0 5
Dizziness	0 (0%)	2 (4.44%)	0 .

			0 1
Disorientation	0 (0%)	0 (0%)	. 0 5

**Table 6:** Assessment of quality of life for women during postpartum period.

Items	Ibuprofen [45]	Acetaminophen [45]
Physical aspect	92.10 ± 1.13	87.34 ± 1.26
Psychological aspect	85.40 ± 4.66	83.33 ± 4.56
Emotional and social aspects	92.40 ± 2.67	88.75 ± 3.66
Daily activity	86.53 ± 4.56	87.70 ± 4.63

## Discussion

We enrolled demographic and clinical outcomes and found women with ages 40–45 were in the highest class with 30 cases, followed by women with ages 30–34 years with 24 cases; BMI was classified into underweight, who included 4 cases; normal weight included 25 cases, overweight included 30 cases, obesity included 31 cases, and the rate of women with comorbidities was 40%, with the greatest factors being the prevalence of hypertension with 30 cases, obesity with 33 cases, and the rate of women smokers being 4.44% and non-smokers were 95.56%.

In addition, our study were shown maternal characteristics outcomes, where gestational age was  $267.89 \pm 5.32$  days in Ibuprofen group and  $270.86 \pm 3.24$  in Acetaminophen group, birth weight 2.5 - 3.9 (Kg) was 78 (86.67%), < birth weight 2.5 kg was 4 (4.44%), and birth weight  $\geq 4$  kg was 8 (8.89%) in Ibuprofen group while birth weight 2.5 - 3.9 (Kg) was 75 (83.33%), < birth weight 2.5 kg was 5 (5.56%), and birth weight  $\geq 4$  kg was 10 (11.11%) in Acetaminophen group, cesarean section was 18 cases and Vaginal delivery was 72 cases in Ibuprofen group but cesarean section was 23 cases and Vaginal delivery was 67 cases in Acetaminophen group, singleton pregnancy was 43 cases and twin pregnancy was 2 in Ibuprofen group, while singleton pregnancy was 44 cases and twin pregnancy was 1 in Acetaminophen group.

For the Ibuprofen group, chronic hypertension requiring treatment include 8 (17.78%), the need for IV antihypertensives before delivery include 30 (66.67%), maximum SBP before delivery was  $182.8 \pm 14.3$ , Maximum DBP before delivery was  $108.34 \pm 10.81$  in prepartum while maximum postpartum SBP was  $105.4 \pm 6.7$ , maximum postpartum DBP was  $72.94 \pm 3.30$ , postpartum  $\geq$  BP 160/110 mm Hg included 5 [11.11%], postpartum stay was  $3.7 \pm 1.6$  days, postpartum stay extended for BP control included 2 (4.44%) in postpartum. For Acetaminophen group, chronic hypertension requiring treatment include 7 (15.56%), need for IV antihypertensives before delivery include 34 (75.56%), maximum SBP before delivery was  $184.24 \pm 12.52$ , maximum DBP before delivery was  $105.23 \pm 10.47$  in prepartum while maximum postpartum SBP was  $107.84 \pm 7.24$ , maximum postpartum DBP was  $80.53 \pm 2.6$ , postpartum  $\geq$  BP 160/110

mm Hg included 6 (13.33%), postpartum stay was  $4.2 \pm 1.4$  days, postpartum stay extended for BP control included 4 (8.89%) in postpartum.

According to pain control and satisfaction rating, we enrolled pain rate before taking treatments of Ibuprofen group was  $5.73 \pm 1.87$ , and Acetaminophen group was  $6.88 \pm 1.24$ , while pain rating after 1 h after taking treatments was  $2.42 \pm 1.38$ , after 2 hours was  $1.54 \pm 1.26$ , after 3 hours was  $1.05 \pm 0.78$ , after 4 hours was  $0.65 \pm 0.65$ , while 1 h after was  $2.94 \pm 1.89$ , 2 h after was  $1.97 \pm 1.80$ , 3 h after was  $1.36 \pm 1.40$ , 4 h after was  $1.02 \pm 0.33$  in Acetaminophen group. For satisfaction rate of the Ibuprofen group included excellent with 32 cases, good with 10 cases, fair with 2 cases, and poor with 1 case, while satisfaction rate of the Acetaminophen group included excellent with 28 cases, good with 13 cases, fair with 3 cases, poor with 1 case.

Recent studies have revealed that Ibuprofen, as well as acetaminophen, are two commonly used pain relievers within postpartum care for women after childbirth; where Ibuprofen was a nonsteroidal anti-inflammatory drug (NSAID) which works by reducing inflammation and pain, whereas acetaminophen is a pain reliever and fever decrease that works by blocking pain signals in the brain. [21 – 24]

According to an American study, the choice between acetaminophen and ibuprofen is based in the individual's specific needs as well as medical history, with Ibuprofen being more effective in reducing pain and inflammation related to childbirth, including uterine cramping as well as perineal discomfort, that could contribute to better overall comfort and well-being, potentially lowering stress levels in the postpartum period. [25]

Some studies found that acetaminophen is typically regarded as safer for usage in nursing women as well as people having a history of gastrointestinal problems since it is less likely to induce stomach irritation and bleeding than NSAIDs such as ibuprofen, where Acetaminophen may be a preferable alternative for postpartum pain treatment for women who are particularly sensitive to NSAIDs and have disorders that prevent their usage. [26 – 29]

### **Conclusion**

Our study found both acetaminophen and ibuprofen treatments successfully relieve pain in postpartum women. Nevertheless, ibuprofen seems more effective and safer in lowering pain and inflammation associated with delivery, particularly uterine spasms, and discomfort, which improves general comfort and well-being and may lower stress levels during the postpartum period.



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