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Review Article

The Eftect of Paracetamol (Acetaminophen) for Postoperative Pain Control Breast Surgery: Systematic Review and Mata-Analiz Study

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ABSTRACT

Background: Breast surgery (BS) is one of the types of surgery that will leave complications for patients. This systematic review study was conducted with the aim of determining the effect of Paracetamol (acetaminophen) on pain after BCS using a systematic review method.
Methods: This study aimed to determine the effect of Paracetamol (acetaminophen) on pain after BCS by systematic review method and using PARISMA checklist. the search was conducted in all articles published in Scopus, ISI, PubMed, EBSCO, Embase and Google scholar search engine in the period of 1.1.2000 to 6.1.2024. The checklist included the type of surgery performed, the year the article was published, the type of pain assessment tool, the drug intervention performed, and the results of the drug's effect on the pain of BS patients. Data analysis was done descriptively with the help of Endnote software.
Results: According to the findings in the initial search, a number of 545 articles were extracted, and according to the performed screenings, finally, 9 articles were included in the systematic review stage. In relation to pain measurement tool, VAS tool was used in 7 articles. But in the article of De Oliveira et al and colleagues, the QOR-40 scale was used, and in the article of Ohnesorge et al and colleagues, the NRS tool was used. The articles were published between 2005 and 2024. In all the articles, at least two groups were used. The findings of all studies have shown the effect of Paracetamol (acetaminophen) on pain reduction in patients after BS.
Conclusions: Considering the effect of Paracetamol (acetaminophen) on reducing the pain of patients with BS, it is suggested that this drug be prescribed to reduce the pain of these patients.

Introduction

Pain is a mental and complex phenomenon that is defined differently by the patient or the treatment staff [1]. Pain is one of the important complications of diseases that affects many people [2-3]. Considering that pain imposes many physical and psychological complications on patients, it is necessary to identify the factors that are effective in causing pain, and it is necessary to take necessary measures in this field [4-5]. Also, if the experience of pain relief is insufficient, it affects the patient's social performance and well-being and causes anxiety, depression, and a decrease in the patient's quality of life [6-7].

Reviewing and evaluating sufficient documentation in the field of pain management and regular evaluation is necessary to check the pain status of patients after surgery [8]. Many barriers, including barriers related to employees (nurses, doctors, other personnel), barriers

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related to the system, and barriers related to the environment are effective in pain management [9-10]. Considering the high severity of pain after surgery, for this reason, pain management of patients after surgery should be prioritized [11]. So that it has been estimated that 80% of patients experienced pain after surgery and about 70% of these patients were in severe pain in terms of perceived pain intensity [12-13].

Pain management after surgery is considered one of the most important priorities of the treatment staff. Pain experience varies depending on the type of disease. In fact, pain is influenced by various factors such as the type of surgery, the duration of surgery, the method of surgery, etc. [14-16]. If the pain is not relieved after surgery, complications such as personal suffering, re-admission of the patient to the hospital, cardio-respiratory complications and care pressure will occur in the patient [1].

Breast surgery (BS) is one of the types of surgery that will leave complications for patients [17-19]. One of the reasons for performing BS is the presence of BC in patients [20]. Breast cancer is one of the most common types of cancer among women, and in 2020, with the rate of 2.26 million new cases, it has the highest incidence of cancer among patients. Also, in 2020, more than two-thirds of breast cancer deaths occurred in less developed countries, which is considered a serious health risk in these countries [21-23]. The reported rate of chronic persistent postsurgical pain (CPSP) related to BS has been reported to be high, which is why it is a priority to identify drugs effective in reducing the pain of these patients [24-26].

Aim

This systematic review study was conducted with the aim of determining the effect of Paracetamol (acetaminophen) on pain after BCS using a systematic review method.

Methods

This study aimed to determine the effect of Paracetamol (acetaminophen) on pain after BCS by systematic review method and using PARISMA checklist [1].

Selection of studies

The PICO criterion was used to select the articles.

P: Patients with BCS;

I: Pain score of patients with BCS;

C: Comparison of pain in all of group (Experimental/Control or Placebo);

O: The effect of Paracetamol (acetaminophen) drug on patients' pain scores;

Paper selection and data extraction

The search was conducted in all articles published in Scopus, ISI, PubMed, EBSCO, Embase and Google scholar search engine in the period of 1.1.2000 to 6.1.2024.

Inclusion and exclusion criteria

All the original articles in English language that investigated the effect of Paracetamol (acetaminophen) on the pain status of patients with BS were included in the study. If the full file of the article is not accessible for any reason, it is excluded from the study.

Data extraction

The checklist included the type of surgery performed, the year the article was published, the type of pain assessment tool, the drug intervention performed, and the results of the drug's effect on the pain of BS patients.

Statistical analysis

Data analysis was done descriptively with the help of Endnote software.

Results

(Figure 1) shows the findings of the articles included in the systematic review. According to the findings in the initial search, a number of 545 articles were extracted, and according to the performed screenings, finally, 9 articles were included in the systematic review stage.

In relation to pain measurement tool, VAS tool was used in 7 articles. But in the article of De Oliveira et al [27] and colleagues, the QOR-40 scale was used, and in the article of Ohnesorge et al [28] and colleagues, the NRS tool was used. The articles were published between 2005 and 2024. In all the articles, at least two groups were used. The findings of all studies have shown the effect of Paracetamol (acetaminophen) on pain reduction in patients after BS (Table 1).

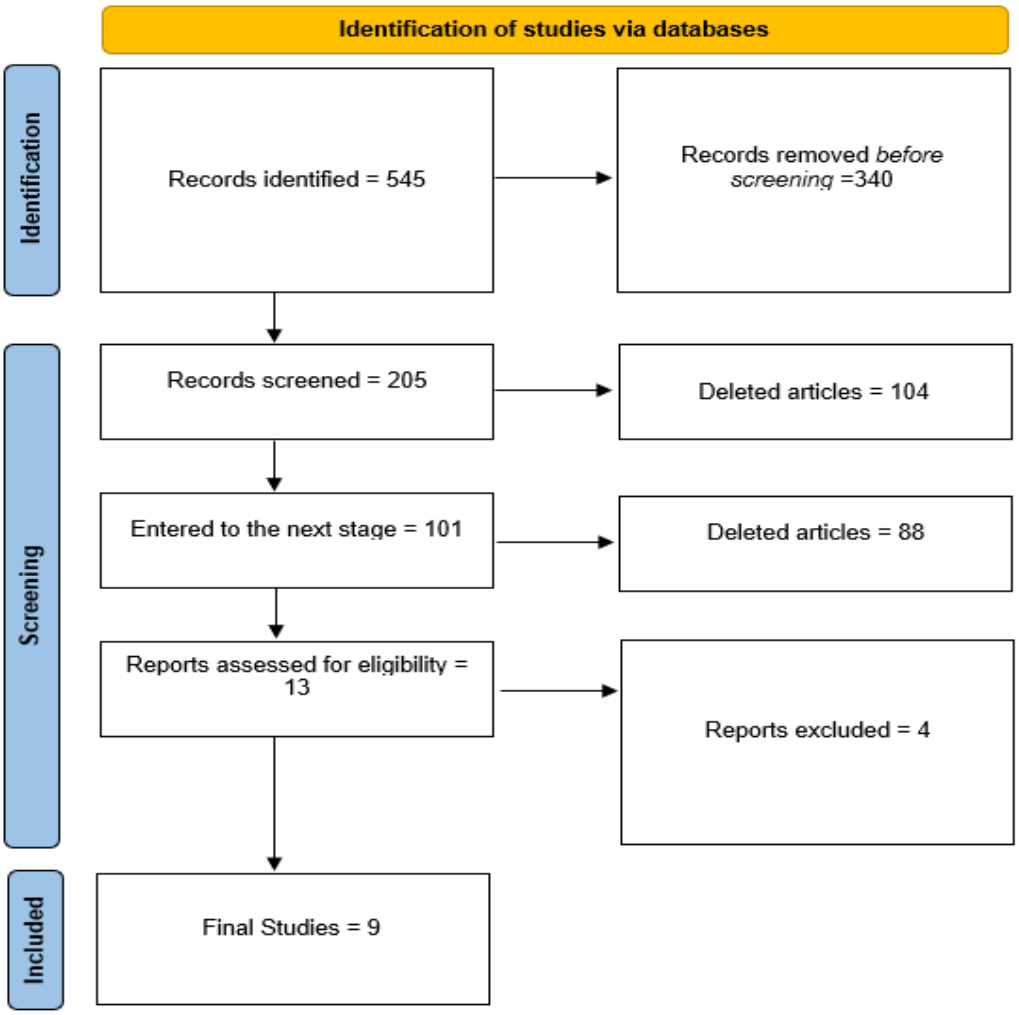

Figure 1- Flowcharts for systematic review.

Table 1- Characteristics of articles with the prescription of Paracetamol (acetaminophen) to the systematic review stage to reduce pain

-	Author Name	Year	Type of surgery	Scale	Intervention	Result		Conclusion
1	Mitchell A et al[29]	2008	Outpatient BS	VAS (0–100 mm)	AcIBU: 400 mg of ibuprofen+650 mg of acetaminophen+ T3: acetaminophen + caffeine codeine	AcIBU Group Days 0 = 26.9 (18.1) Days 2 = 19.6(18.2) Days 5 = 14.7(16.4) Days 7 = 10.7(14.6)	T3 Group Days 0 = 30.1(20.6) Days 2 = 20.4(17.4) Days 5 = 14.8(16.5) Days 7 = 12.3(14.9)	According to the findings, the patients' pain was reduced by taking medicine in both groups, but there was no difference between the pain intensity in the AcIBU group and the T3 group. Also, 92% of AcIBU group patients and 89% of T3 group patients were satisfied with pain control.

2	Wagle et al [30]	2018	MRM	VAS	**Group-I:** paracetamol 1g (prior to induction) **Group-II:** paracetamol 1g (end of the surgery)	Group-I 0 Mins: 1.9(0.9) 30 Mins: 2(1.4) 1 hrs: 2.5(1.2) 2 hrs: 2.5(0.6) 6 hrs: 1.8(1.5) 12 hrs: 3.6(1.6) 24 hrs: 1.4(0.9)	Group-I 0 Mins: 2.9(1.1) 30 Mins: 3.1(1.9) 1 hrs: 3.6(1.9) 2 hrs: 3(0.9) 6 hrs: 2.7(1.2) 12 hrs: 3.9(1.8) 24 hrs: 1.7(1.1)	A significant difference was observed between the two groups' pain from the beginning of the intervention to 6 hours after the intervention ($p<0.05$), but this difference was not significant at 12 and 24 hours after the intervention ($p>0.05$).
3	De Oliveira et al [27]	2018	Mastectomy	QOR-40 scale	**Group-I:** paracetamol 1g (end of the surgery) **Group-II:** Placebo	Acetaminophen: 31 (29 to 33)	Placebo: 27 (22 to 30)	The use of Acetaminophen caused a significant reduction in the pain of patients ($P<0.006$).
4	Ohnesorge et al [28]	2005	BCS	NRS (0-10)	**Group-I:** Paracetamol **Group-II:** Metamizole **Group-III:** Placebo	-	-	The pain reduction rate of patients in the group receiving Paracetamol was higher than the patients in the metamizole group. The amount of pain in group 1 and group 4 patients was higher than group 2 and group 3 patients. In all investigated groups, the pain level was reported at the lowest level 6 hours after surgery. The amount of preventive analgesic effect in the group of patients receiving diclofenac was higher than that of patients in the acetaminophen group. Also, if these two drugs were used in combination (group 3), the analgesic effect of this drug was reported as the highest amount of pain reduction.
5	Wadhwa [31]	2015		VAS	**Group-I:** acetaminophen 10mg/kg **Group-II:** diclofenac sodium 1mg/kg **Group-III:** acetaminophen + diclofenac sodium **Group-IIII:** placebo.	**Mean VAS** **G-I:** 4.2(0.12) **Group-II:** 3.47(0.12) **Group-III:** 2.84(0.12) **Group-IIII:** 4.46(0.12)	-	

6	Emre et al [32]	2009	Mastectomy	VAS	**Group-I:** IV paracetamol **Group-II:** saline	-	-	Paracetamol had reduced the patients' pain, but this reduction was not statistically significant compared to the control group.
7	Kampe et al [33]	2006	BCS	VAS (0–100 mm)	**Group-I:** IV paracetamol **Group-II:** saline solution of IV dipyrone	Paracetamol 4 h after:17.3(18.7) 8 h after:12(11.6) 20 h after:11.7(15.4) 30 h after:7.5(8.7)	Dipyrone 4 h after: 20.9(21.4) 8 h after: 15.3(19.9) 20 h after:9(15.2) 30 h after:5.7(9.8)	The use of Paracetamol had reduced the pain of the patients.
8	Nonaka et al [34]	2016	Mastectomy	VAS	**Group-I:** 1 G acetaminophen **Group-II:** 50 mg flurbiprofen	-	-	The analgesic effect of flurbiprofen and acetaminophen was equal in patients.
9	Alsaadi et al[35]	2024	BCS	-	**Group-I:** IV paracetamol **Group-II:** Placebo	-	-	The use of Paracetamol had reduced the pain of the patients.

Discussion

This study was conducted with the aim of determining the effect of Paracetamol (acetaminophen) on the pain of patients undergoing BS surgery. According to the findings, the drug Paracetamol (acetaminophen) had reduced the pain of the patients. Paracetamol (acetaminophen) drug is effective in reducing the pain of patients and various studies conducted in this field have confirmed this issue. So, in the study of Coulthard et al., Paracetamol reduced the pain of patients undergoing oral surgery [36] and it is consistent with the results of this study. A person suffering from a disease leads to many complications, including physical and mental complications in the person. Also, a large economic burden is left for the patient and the patient's quality of life undergoes changes [40-43].

In systematic review studies, Paracetamol has also reduced the pain of patients. So that in the study of Mahdavi et al., which had 5 original articles on the effect of Paracetamol on the pain status of Cardiac Surgery patients, this drug had reduced the number of patients [37]. In Ghaffarpasand et al.'s study, which included 5 original articles on the effect of Paracetamol on pain after craniotomy patients, the injection of this drug (before surgery) reduced the pain of patients after surgery [38]. The results of the study by Ghaffarpasand et al. and the study by Mahdavi et al. are consistent with the results of this study.

On the other hand, in the study of Machado et al., the effect of Paracetamol on patients' back or neck pain was investigated in 12 original articles. The findings of a review study by Machado et al showed that paracetamol did not have a positive effect on the pain, disability and quality of life of patients [39]. From the difference between the results of the current review study in the group of BS patients and the results of the study by Machado et al., it can be pointed out the difference in the type of patients investigated, which may have different effects on the response of the drug to the patients' pain.

Conclusion

Considering the effect of Paracetamol (acetaminophen) on reducing the pain of patients with BS, it is suggested that this drug be prescribed to reduce the pain of these patients.

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