

# The effect of parecoxib sodium combined with perioperative psychological care on postoperative pain in elderly patients with hip fractures

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**Abstract. – OBJECTIVE:** This study aimed to investigate the effect of parecoxib sodium combined with perioperative psychological nursing on postoperative pain in elderly patients with hip fractures.

**PATIENTS AND METHODS:** 80 elderly patients with hip fractures who received surgical treatment in our hospital were selected as the research subjects. According to the different interventions received by the patients, they were divided into a control group (CG) (n=40) who received intravenous parecoxib sodium intervention before surgery, and an observation group (OG) (n=40) who received perioperative psychological nursing intervention in addition to the intervention received by the CG. The pain status, psychological status, hip joint function, daily living ability level, and quality of life of the two groups were compared.

**RESULTS:** After surgery, the VAS score, SAS score and SDS score of the OG were lower than those of the CG ( $p < 0.05$ ). After surgery, the Harris score of the OG was higher than that of the CG ( $p < 0.05$ ). Before surgery, there was no significant difference in the Barthel index and SF-36 score between the two groups ( $p > 0.05$ ). After surgery, the Barthel index and SF-36 scores of both groups showed a significant improvement compared to before surgery, and the scores in the OG were higher than those in the CG ( $p < 0.05$ ).

**CONCLUSIONS:** Perioperative psychological nursing combined with preemptive analgesia of parecoxib sodium has a significant positive effect on elderly patients with hip fractures after surgery. The combined nursing intervention can further alleviate postoperative pain, improve patients' psychological status, promote the recovery of hip joint function, and significantly improve the daily living ability and quality of life of patients. The combined intervention plan is worthy of clinical promotion and application.

## Key Words:

Parecoxib sodium, Perioperative period, Psychological nursing, Elderly, Hip fractures, Surgery, Postoperative pain, Influence.

## Introduction

Hip fracture in the elderly is a common orthopedic disease, and its incidence increases year by year with the aging of the population<sup>1</sup>. This disease usually requires surgical treatment, but surgery can cause significant trauma to patients, leading to a long recovery and rehabilitation period, which seriously affects the quality of life of patients<sup>2</sup>. Moreover, patients often experience postoperative pain, psychological stress, and decreased hip joint function after surgery<sup>3</sup>. Among them, postoperative pain is one of the most concerning issues for patients, seriously affecting their recovery and quality of life<sup>4</sup>. Therefore, how to effectively relieve postoperative pain in elderly hip fracture surgery and improve the quality of life of patients has become a hot research topic.

In perioperative care, early pain relief is a crucial aspect. Parecoxib sodium is a selective receptor agonist with a potent preemptive analgesic effect and no side effects such as respiratory depression, making it a preferred drug for perioperative pain relief<sup>5,6</sup>. In addition, perioperative psychological care has gradually received attention from clinical doctors and patients. Psychological care measures can alleviate patients' anxiety, fear, and pain before and after surgery, thereby promoting patient recovery<sup>7-9</sup>. However, the current research on the impact of parecoxib sodium

combined with perioperative psychological care on postoperative pain in elderly hip fracture surgery is not yet sufficient. Therefore, this study aims to explore the effects of parecoxib sodium combined with perioperative psychological care on postoperative pain in elderly hip fracture surgery, providing a more scientific theoretical basis and practical guidance for clinical nursing.

## Patients and Methods

### Study Objectives

We selected 80 elderly patients with hip fractures in our hospital as the study objects and collected basic information such as gender, age, fracture type, and cause of injury. All patients received surgical treatment in our hospital and were divided into two groups based on the different interventions they received. The CG (n=40) received an intravenous infusion of Parecoxib sodium before surgery, while the OG (n=40) received perioperative psychological care intervention in addition to the intervention received by the CG patients.

### Inclusion and Exclusion Criteria

Inclusion criteria: (1) patients aged 65 years or older; (2) diagnosed with simple femoral neck fracture or intertrochanteric fracture and undergoing surgical treatment in our hospital; (3) willing to participate in the study and sign the informed consent form.

Exclusion criteria: (1) patients with intellectual or severe cognitive impairment; (2) patients with a history of mental illness or currently receiving psychiatric medication; (3) patients with severe heart, liver, kidney, or other organ dysfunction; (4) patients allergic to or contraindicated for parecoxib sodium; (5) patients with pre-existing pain or depressive symptoms or receiving relevant treatment before surgery; (6) patients with other serious illnesses or undergoing surgical interventions before surgery.

### Methods

#### CG group

All patients received preoperative parecoxib sodium (Pfizer Pharmaceuticals Ltd., Dalian, Liaoning, China) preemptive analgesia and underwent surgery under spinal anesthesia using standard surgical techniques for hip fractures. After surgery, intravenous analgesic treatment,

including propofol (Shanghai Jia Shi Tang Pharmaceutical Co., Ltd., Shanghai, China) and fentanyl (Nanjing Huamei Pharmaceutical Co., Ltd., Nanjing, Jiangsu, China), was administered as needed based on the patient's pain level and requirements, and necessary nursing and rehabilitation guidance was provided.

#### OG group

In addition to the treatment provided to the CG, perioperative psychological nursing intervention was also conducted. The perioperative psychological nursing intervention included the following aspects. (1) Psychological preparation for the operation: preoperative care personnel provided psychological counseling to elderly patients to alleviate their fear and anxiety before surgery. They explained the surgical process, anesthesia methods, and perioperative care in detail to enhance patients' understanding and confidence and reduce their psychological pressure. (2) Psychological support during the operation: nurses closely monitored patients' emotional changes through conversations, care, and comfort before and during the operation, promptly discovered and solved problems, and alleviated patients' tension and fear. (3) Psychological intervention during the recovery period: after surgery, nursing staff provided rehabilitation guidance and psychological support to encourage patients to actively participate in rehabilitation training and activities, enhance their confidence, improve their self-management ability, and promote fracture healing and recovery. Additionally, nursing staff also provided more attention and assistance to patients based on their actual conditions, combined with life knowledge and experience, to achieve the effect of reducing pain, restoring function, and improving the quality of life.

### Observation Indicators

#### (1) Pain

The patient's pain was assessed before and after surgery using the Visual Analogue Score (VAS) scoring method<sup>10</sup>. The VAS scoring method is a commonly used method for pain assessment, usually using a 10 cm horizontal line with "no pain" and "worst pain" marked on either end. The patient needs to mark their level of pain on the line, and the distance between the marked point and the "no pain" end is used as the pain score, with a score range of 0-10 points. The higher the score, the more severe the pain.

(2) *Psychological status*<sup>11</sup>

The patient's psychological status was evaluated before and after surgery using Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS) scores. The SAS was used to evaluate the patient's level of anxiety, with a total score of 100 points and a cut-off value of 50 points. The lower the score, the lower the patient's level of anxiety. The SDS was used to evaluate the patient's level of depression, with a total score of 100 points and a cut-off value of 53 points. The lower the score, the lower the patient's level of depression.

(3) *Hip joint function*

The patient's hip joint function was evaluated before and after surgery using the Harris scoring method<sup>12</sup>. The Harris scoring method is a commonly used method for evaluating the hip joint function, with scoring criteria mainly including pain, gait, function, muscle strength, joint range of motion, and other five aspects. The total score is 100 points, and the higher the score, the better the hip joint function.

(4) *Activities of daily living*

The patient's activities of daily living were evaluated before and after surgery using the Barthel Index<sup>13</sup>. The Barthel Index mainly includes 10 aspects, such as eating, washing, dressing, toileting, controlling bowel and bladder movements, getting in and out of bed, walking, and climbing stairs. The total score is 100 points, and the higher the score, the stronger the patient's daily living ability.

(5) *Quality of life*

The patient's quality of life was evaluated before and after surgery using the SF-36 scoring method<sup>14</sup>. The SF-36 scoring includes eight

aspects such as physical function, role-physical, pain, general health, and mental health. The total score is 100 points, and the higher the score, the better the patient's quality of life.

**Statistical Analysis**

SPSS 22.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. For continuous variables, the distribution was described using mean and standard deviation, and statistical analysis was performed using a *t*-test or analysis. For categorical variables, the distribution was described using frequency and percentage, and statistical analysis was performed using  $\chi^2$  test or Fisher's GraphPad Prism 8 (GraphPad Software, Inc., La Jolla, CA, USA) was used for data visualization. A *p* lower than 0.05 was considered statistically significant.

**Results**

**Baseline Characteristics**

The baseline characteristics of the two groups of patients were similar, with no statistically significant differences (*p* > 0.05), as shown in Table I.

**VAS Score**

After surgery, the VAS score of the OG group was lower than that of the CG group (*p* < 0.05), as shown in Table II.

**Psychological Status**

As shown in Figure 1, the SAS scores before and after surgery in the CG were (58.7 ± 6.4, 52.6 ± 5.2) and (59.5 ± 7.6, 52.7 ± 6.3), respectively. The SAS scores before and after surgery in the

**Table I.** Baseline characteristics.

Basic data information	CG (n = 40)	OG (n = 40)	t/ $\chi^2$	<i>p</i>
Gender			0.202	0.653
Male	23	21		
Female	17	19		
Average age (years)	77.2 ± 4.9	77.4 ± 5.2	0.177	0.859
Fracture type			0.266	0.605
Femoral neck fracture	31	29		
Intertrochanteric Fracture	9	11		
Cause of injury			0.486	0.485
Traffic accident	27	24		
Fall down	8	10		
Other	5	6		

**Table II.** VAS score.

Group	VAS score (points)	
	Preoperative	Postoperative
CG (n = 40)	8.1 ± 1.3	2.7 ± 1.3
OG (n = 40)	8.2 ± 1.4	1.5 ± 0.9
<i>t</i>	0.331	4.800
<i>p</i>	0.741	< 0.001

**Table III.** Hip joint function.

Group	Harris score (points)	
	Preoperative	Postoperative
CG (n = 40)	32.97 ± 3.48	56.97 ± 5.42
OG (n = 40)	33.04 ± 3.54	63.24 ± 6.59
<i>t</i>	0.089	4.647
<i>p</i>	0.929	< 0.001

OG were (57.9 ± 6.6, 42.7 ± 4.9) and (59.8 ± 7.4, 43.8 ± 5.3), respectively. Before surgery, the SAS and SDS scores of the two groups of patients were similar ( $p > 0.05$ ). After surgery, the SAS and SDS scores in the OG group were lower than those in the CG group ( $p < 0.05$ ).

**Hip Joint Function**

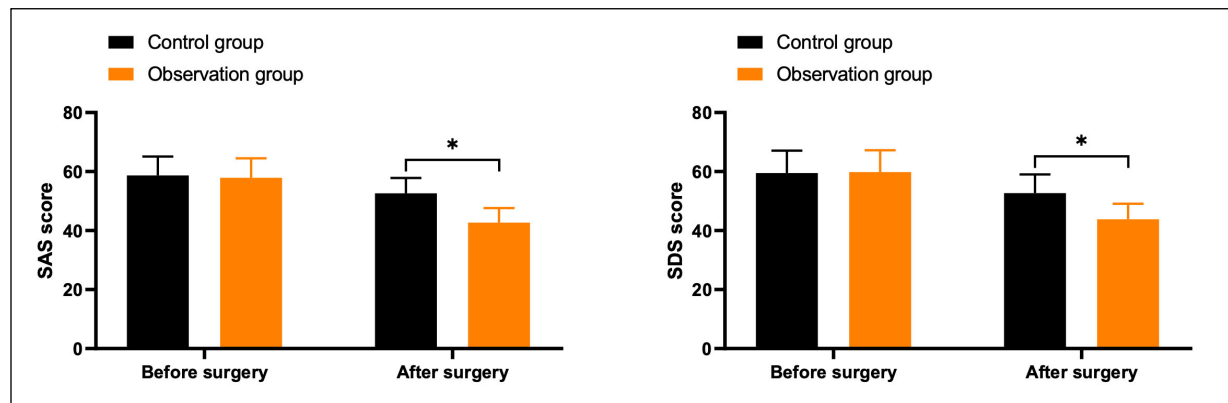
Before the surgery, there was no significant difference in Harris scores between the two groups of patients ( $p > 0.05$ ). After the surgery, the Harris score in the OG was significantly higher than that in the CG ( $p < 0.05$ ), as shown in Table III.

**Daily Living Ability and Quality of Life**

As shown in Figure 2, the Barthel index and SF-36 scores of the CG before and after surgery were (43.59 ± 4.76, 60.73 ± 6.05) and (46.68 ± 4.25, 68.29 ± 5.37), respectively. The Barthel index and SF-36 scores of the OG before and after surgery were (44.32 ± 4.67, 66.92 ± 6.74) and (46.52 ± 4.41, 79.74 ± 7.63), respectively. After surgery, the Barthel index and SF-36 scores of both groups showed a significant improvement compared to before surgery, and the scores in the OG were higher than those in the CG ( $p < 0.05$ ).

**Discussion**

Hip fracture refers to the fracture of the hip bone (femoral head, acetabulum, femoral neck, etc.) under external force, which usually occurs in older people or those with osteoporosis and other bone diseases<sup>15</sup>. Hip fracture is a serious fracture, with a relatively long treatment process and a prolonged recovery period<sup>16</sup>. Hip fractures can be divided into femoral neck fractures, intertrochanteric fractures, and subtrochanteric fractures. These types of fractures can have a certain impact on the patient’s physical health and daily life ability<sup>17</sup>. In recent years, with the aging population in China becoming more severe, the situation of hip fractures in the elderly has become an important health issue for the elderly. Currently, the main clinical treatment method for elderly hip fractures is surgical treatment. However, due to the invasiveness of surgical treatment and the problems of elderly patients’ self-recovery, the postoperative recovery period of elderly hip fracture patients is longer, and postoperative pain is more severe<sup>18,19</sup>. If timely and effective corresponding treatment interventions are not carried out, this may have a serious impact on the patient’s psychology, quality of life, and other factors.



**Figure 1.** Psychological status (\*indicates comparison  $p < 0.05$ ).

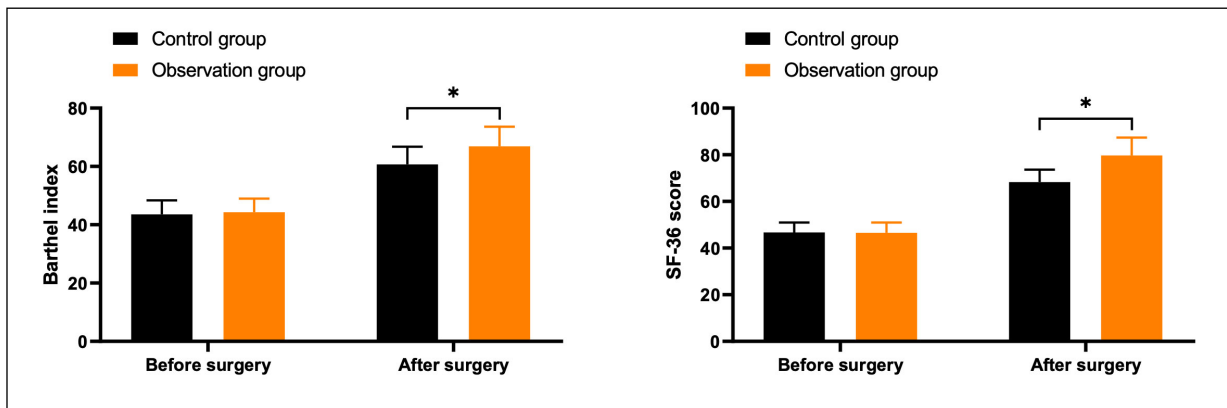


Figure 2. Daily living ability and quality of life (\*indicates comparison  $p < 0.05$ ).

Paracetamol sodium is a commonly used non-steroidal anti-inflammatory drug (NSAID) in clinical practice, which belongs to the selective cyclooxygenase-2 (COX-2) inhibitors<sup>20,21</sup>. By inhibiting the action of COX-2 enzyme, it can reduce the synthesis of inflammatory mediators in the body, thereby exerting anti-inflammatory and analgesic effects<sup>22</sup>. Currently, paracetamol sodium is widely used in pain management for postoperative pain, acute osteoarthritis, rheumatoid arthritis, and other diseases. However, studies<sup>23</sup> have shown that although paracetamol sodium is an effective pain reliever, its duration of action may be prolonged in elderly people due to decreased metabolic function, leading to insufficient pain relief. At the same time, paracetamol sodium can only exert a simple pharmacological effect and cannot have an intervention effect on the psychology of elderly people. Research<sup>24,25</sup> has found that hip fracture surgery in the elderly is a high-risk operation, and the surgery itself and the postoperative rehabilitation process may cause psychological problems to patients, such as anxiety, depression, and fear. Perioperative psychological care refers to comprehensive intervention and support for patients' emotions, cognition, behavior, etc., through various psychological intervention methods and measures before, during, and after surgery, helping patients effectively cope with the physiological and psychological reactions during the perioperative period, and achieve the purpose of relieving pain, reducing anxiety, enhancing confidence, and promoting recovery<sup>26</sup>. Perioperative psychological care includes various methods and techniques such as psychological assessment, psychological counseling, psychological support, and cognitive-behavioral intervention, which can be implemented through psychological counsel-

ing, cognitive restructuring, deep breathing, relaxation training, etc. Perioperative psychological care not only can improve patients' psychological state and quality of life but also promote their recovery and improve their condition<sup>27</sup>. Based on this, this study attempts to combine perioperative psychological care with paracetamol sodium and compare it with simple paracetamol sodium, aiming to explore the effect of the combined intervention on pain relief after hip fracture surgery in the elderly.

The results of this study showed that after surgery, the VAS scores in the OG group were significantly lower than those in the CG group ( $p < 0.05$ ); the SAS and SDS scores in the OG were also significantly lower than those in the CG group ( $p < 0.05$ ); the Harris score in the OG group was significantly higher than that in the CG group ( $p < 0.05$ ); the Barthel index and SF-36 scores in the OG were significantly higher than those in the CG ( $p < 0.05$ ). These results are consistent with previous related studies<sup>28,29</sup>, which confirm that the combined use of perioperative psychological care can have a positive effect on elderly patients undergoing surgery for fractures. Based on previous related studies<sup>30,31</sup> and personal experience, the author believes that the reason why combined perioperative psychological care can have a positive impact on elderly patients undergoing surgery for fractures is:

- (1) Reducing anxiety and depression: the period before and after surgery is the most emotionally vulnerable time for elderly patients with fractures, and perioperative psychological care can reduce anxiety and depression in patients through emotional support and psychological counseling, thereby improving patients' emotional state and quality of life.

- (2) Reducing pain and promoting recovery: perioperative psychological care can reduce postoperative pain in patients through guided deep breathing, relaxation training, and other methods, thereby promoting patients' physical recovery and rehabilitation.
- (3) Improving treatment compliance: perioperative psychological care can enhance patients' confidence and determination in treatment, improve their compliance with treatment, and thus promote the recovery process.
- (4) Improving the quality of life: perioperative psychological care can enhance patients' confidence and positivity in life through support and counseling, promote patients' social activities and participation, and improve their quality of life.

## Conclusions

As shown above, the combination of Parecoxib sodium preemptive analgesia and perioperative psychological nursing has a significant positive impact on elderly hip fracture patients. The combined application of this nursing intervention can further alleviate postoperative pain, improve patients' psychological status, promote the recovery of hip joint function, and significantly improve their daily living ability and quality of life. Therefore, this combined nursing approach is worthy of clinical promotion and application.

### Ethics Approval

This study has been approved by the ethics committee of Anhui Wannan Rehabilitation Hospital (No. 75489357). All the methods were carried out in accordance with the Declaration of Helsinki.

### Informed Consent

Patients and their families were informed of the research content and voluntarily signed the informed consent.

### Availability of Data and Materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

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### Conflict of Interest

The authors declare that they have no competing interests.

### Authors' Contributions

The authors declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by them. All authors reviewed the manuscript. All authors have read and approved the manuscript.

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