

Evaluation of Light Specific Gravity Ropivacaine Combined with Sufentanil in Hip Arthroplasty at An Advanced Age

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ABSTRACT

Objective: To observe the effect of light specific gravity ropivacaine combined with sufentanil in elderly patients undergoing hip replacement. **Methods:** 89 elderly patients with hip arthroplasty from July 2019 to September 2020 were randomly divided into experimental group and control group. The experimental group was anesthetized with light specific gravity ropivacaine combined with sufentanil. The control group was anesthetized with equal specific gravity ropivacaine to compare the effect of anesthesia and the incidence of adverse reactions. **Results:** there was no significant difference in sensory recovery time and motor recovery time between the experimental group and the control group ($P > 0.05$), and the incidence of adverse reactions between the two groups was low. The sensory block time in the experimental group was shorter than that in the control group ($PP > 0.05$). **Conclusion:** ropivacaine combined with sufentanil subarachnoid anesthesia is more effective in elderly patients undergoing hip arthroplasty, and the safety of the anesthesia scheme is higher, which will not lead to serious adverse reactions during operation. Moreover, the application of the anesthesia scheme can effectively improve the analgesic effect during and after operation, and the clinical application value is high.

1. Introduction

With the increase of age, the body function of the elderly gradually decreased, bone mineral density and bone mass decreased significantly when they were younger, and the probability of orthopedic diseases was very high. Clinically, surgery is a common treatment method for patients with complex orthopedic diseases. The reduction and fixation of broken bones by surgical incision is helpful to relieve pain symptoms and reduce the occurrence of complications. It is of great significance

to improve the quality of life of orthopedic patients. Hip replacement is a common operation in orthopedic field. Hip replacement is often needed in elderly patients with femoral neck fracture. In the course of surgical treatment, high quality anesthesia is essential, but anesthesia may lead to hemodynamic fluctuations and anesthetic risks, so safe and effective anesthesia is essential. Therefore, this paper studies the clinical anesthesia of elderly patients with hip arthroplasty, and compares the effect of different anesthesia schemes.

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2. Information and Methodology

2.1 General Information

This study has been submitted to the ethics committee of our hospital and approved, The 89 elderly patients who underwent hip arthroplasty in our hospital from July 2019 to September 2020 were randomly divided into experimental group (n=45 cases) and control group (n=44 cases) by drawing lots, All subjects were not treated with analgesic drugs within 3 d before the start of the study, And sign informed consent, excluding those with combined cognitive dysfunction. In the experimental group, 23 males and 22 females; Age range 68-79, median age (73.24±2.67) years, Among them ,11 patients with hypertension and 13 patients with diabetes. In the control group, 22 males and 22 females; Age range 67-79, median age (73.37±2.66) years, Among them, 9 patients with hypertension and 12 patients with diabetes. General data of sex and age of experimental group and control group were verified by statistical software $P>0.05$, Comparable.

2.2 Method

2.2.1 Drugs

Ropivacaine: Shijiazhuang four Medicines Co., Ltd., 100 mg. H20203107, specifications

Sufentanil: Yichang Renfu Pharmaceutical Co., Ltd. Production, H20054171, specifications 50µg.

2.2.2 Anesthesia Process

Both groups were given routine perioperative nursing, preoperative examination and routine monitoring of vital signs after entering the operating room. The L3-4 of healthy lateral position or L2-3 spinous process space was selected as the puncture point during anesthesia, and the corresponding anesthetic drugs were injected according to the difference of patient group after the successful combination of lumbar and hard puncture. Subarachnoid injection of 10 mg ropivacaine into 3 ml light specific gravity solution combined with sufentanil (2.5µg) was performed in the experimental group. The time of administration was 30s; and the control group was anesthetized with equal specific gravity ropivacaine 15 mg. The time of administration was 30s. 5min, 10min, 15min after anesthesia, the anesthetic effect and the anesthetic plane were tested respectively. After the effect reached the requirement of operation, the patient's position was adjusted and the subsequent operation was carried out.

2.3 Assessment Criteria

The difference of anesthetic effect and adverse reaction rate between experimental group and control group was verified by statistical software.

Anaesthesia: Sensory block time (test the sensory block plane with a cotton swab, A sensory block time (1-3 points) and an intraoperative analgesia score (T12) were recorded when the affected sensory block plane reached, One point indicates obvious discomfort or pain during the operation, Need intravenous sedation or analgesic drugs for adjuvant treatment; Two points indicate slight discomfort or pain during the operation, but without medication; 3 points indicate no discomfort or pain during operation, sensory recovery time (after injection of anesthetics to complete recovery time of lower limb sensation), motor recovery time (after injection of anesthetics to complete recovery time of lower limb movement), postoperative analgesia score (according to the patient's postoperative self-controlled analgesic pump and other anesthetic use of score assessment, Ten points, After the operation, the patient used a self-controlled analgesic pump deduction of 0.1 points, Deduct 1 point for each additional use of other analgesic drugs)^[1].

Adverse reactions: hypotension, bradycardia, shivering, nausea and vomiting.

2.4 Statistical Methods

The SPSS 24.0 software was used to compare the difference of observation indexes between groups, the counting index was expressed by n(%), and the measurement index was expressed by ($\bar{x}\pm s$). If the P value is less than 0.05, the difference between groups is meaningful.

3. Fruit

3.1 Differences in Anesthetic Effect between Experimental and Control Groups

Table 1 showed that there was no significant difference in sensory recovery time and motor recovery time between the experimental group and the control group ($P>0.05$), and the sensory block time in the experimental group was shorter than that in the control group, while the intraoperative analgesia score and postoperative analgesia score were higher than those in the control group ($P>0.05$).

3.2 Differences in the Incidence of Adverse Reactions between Experimental and Control Groups

Table 2 shows that the incidence of hypotension and shivering in the experimental group was lower than that in the control group, and the difference between the two

Table 1. Differences in anesthetic effect between experimental group and control group (x±s)

Group	n	Duration of sensory block (min)	Intraoperative analgesia score (score)	Feeling recovery time (min)	Exercise recovery time (min)	Postoperative analgesia score (score)
Experimental group	45	12.86±2.68	2.36±0.44	321.52±44.87	207.35±28.39	9.39±0.47
Control group	44	16.35±2.57	2.07±0.51	316.82±57.62	209.47±37.61	7.82±0.85
t	-	6.2681	2.8743	0.4299	0.3006	10.8152
p	-	0.0000	0.0051	0.6683	0.7645	0.0000

Table 2. Differences in the incidence of adverse reactions between experimental and control groups [n(%)]

Group	n	Low blood pressure	bradycardia	Cold War	Nausea and vomiting
Experimental group	45	0(0.00)	2(4.44)	1(2.22)	2(2.22)
Control group	44	6(13.64)	1(2.27)	8(18.18)	1(2.27)
X ²	-	4.5897	0.0004	4.6018	0.0004
p	-	0.0322	0.9842	0.0319	0.9842

groups was statistically significant, $P < 0.05$.

4. Discussion

In the treatment of hip replacement in elderly patients with orthopaedic diseases, Quality intraoperative anesthesia is indispensable, Good surgical anesthesia can not only promote the smooth operation of patients, it also reduces surgical stress, It is helpful to improve the effect of postoperative recovery. This study found that, Experimental group with light specific gravity ropivacaine combined with sufentanil had shorter sensory block time than control group with equal specific gravity ropivacaine anesthesia ($P < 0.05$), And the intraoperative pain score and postoperative pain score in the experimental group were also higher than those in the control group ($P < 0.05$), between groups, there was no significant difference in sensory recovery time, motor recovery time and incidence of adverse reactions ($P > 0.05$). The results demonstrate the high-quality effect of light specific gravity ropivacaine combined with sufentanil in elderly patients with hip arthroplasty. The reason for the results is that ropivacaine is a commonly used anesthetic, it has the advantages of good anesthetic effect, long aging and less adverse reactions. But sufentanil, as an analgesic, has the advantage of quick action, Although the duration is short, the analgesic and sedative effects are obvious, Therefore, the intraoperative pain score and postoperative pain score of the experimental group were higher. And, Application of light specific gravity ropivacaine combined with sufentanil, can reduce the patient's posture changes caused by blood pressure fluctuations^[3]. The range of light specific gravity ropivacaine block is narrower than that of equal specific gravity ropivacaine, further reduce the incidence of hypotension, hypothermia^[4-5]. High incidence of shivering after anesthesia

in elderly patients, Shivering can lead to increased oxygen consumption, energy consumption, can induce the old patient coexisting cardiopulmonary basic disease, Increase intraoperative risk and postoperative complications^[6-8]. Addition of opioid analgesics, sufentanil, can provide perfect intraoperative analgesia, Reduce the incidence of shivering among patients, clearly reduce the^[9] of oxygen consumption and energy consumption caused by shivering. The postoperative analgesia is accurate, compared with the control group, the experimental group was^[10] more likely to stand on the ground the next day. Early getting out of bed in elderly patients can reduce postoperative complications due to bed rest, such as pulmonary infection, thrombosis, muscle atrophy and other^[11]. In the study of Geng Sujuan scholars, Ropivacaine alone reduces the duration of sensory block, But the combination of sufentanil can significantly improve the blocking effect, it helps to prolong the time of anesthesia and the effect of analgesia, and high security, Patients do not have severe adverse reaction^[2]. The results of this study are basically consistent with the contents of this study, to further prove the good effect of ropivacaine combined with sufentanil subarachnoid anesthesia in the treatment of hip arthroplasty in elderly patients with orthopedic diseases, it is suggested that it can be used as an ideal anesthetic scheme in the treatment of elderly patients.

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