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Original Article

Small incision phacoemulsification with topical anesthesia during perioperative period: nursing experience and its application

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Abstract: Purpose: To investigate the perioperative clinical nursing experience and application effect of small incision phacoemulsification with topical anesthesia. Methods: Retrospectively analysis of 126 patients who came to our hospital for small incision phacoemulsification with topical anesthesia from November 2018 to November 2019. These patients were randomly divided into a study group and a control group, with 63 patients in each group. Patients from both groups underwent small incision phacoemulsification with topical anesthesia. The control group used routine nursing care during the perioperative period, and the study group used comprehensive nursing care. The clinical intervention effects of the two groups were compared. Results: The visual acuity of the two groups of patients after intervention was significantly improved (P<0.001), and the visual acuity of the study group after intervention was significantly better than that of the control group (P<0.001); the astigmatism of the study group after intervention was obviously lower (P<0.001); the Self-rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) scores of the two groups of patients after intervention were significantly lower than those before the intervention, and the decrease of SAS and SDS scores of the study group were more significant (P<0.001); The clinical nursing satisfaction of the study group was significantly higher than that of the control group (P<0.05); the postoperative complication rate of the study group was significantly lower than that of the control group (P<0.05); the cataract knowledge scores of the two groups of patients after intervention were both significantly higher than before the intervention, and the increase of cataract knowledge score of the study group was more remarkable (P<0.001). Conclusion: The comprehensive nursing mode used in small incision phacoemulsification with topical anesthesia for cataract extraction can effectively improve the patient's visual acuity, reduce the astigmatism, and have a lower incidence of postoperative complications, which has high clinical application value.

Keywords: Surface anesthesia small incision, phacoemulsification for cataract, perioperative nursing care, application value

Introduction

Cataract is an eye disorder caused by lens opacity, and it is the top blind-causing disease worldwide [1, 2]. Under normal circumstances, the lens is transparent, while it may become deteriorated and turbid and eventually lead to impaired vision due to a variety of reasons. If not treated in time, the patient can go blind. Epidemiological surveys have shown that [3], blindness caused by cataract accounts for about 43%-45% of the world's blind population, and it often occurs in people over 50 years old. The main clinical symptom is painless and progressive vision loss. Phacoemulsification is the first choice for the treatment of cataracts. The purpose of the treatment is to remove the patient's cloudy lens and implant an intraocular lens [4, 5]. Meanwhile, the operation also has the advantages of small incision, safe and convenient operation, and is well accepted by patients and doctors. However, patients with cartaract are mostly elderly with various underlying diseases such as hypertension and diabe-

tes. Their physiological functions gradually decline, their thinking is retarded, and they are prone to negative emotions during treatment and with complications such as corneal edema after surgery. Hence, routine perioperative nursing care are unable to meet the needs of elderly patients. effective nursing measures are needed to reduce postoperative complications of patients and improve treatment effects. Comprehensive nursing method is an active intervention mode, which focuses more on the mental health of patients, helps patients establish a positive mindset, and enhances clinical effects [6, 7]. In this study, we investigate and evaluated the application effect of comprehensive nursing in small incision phacoemulsification cataract extraction with topical anesthesia.

Materials and methods

General information

The clinical data of 126 patients who came to our hospital for small incision phacoemulsification with topical anesthesia were retrospectively analyzed from November 2018 to November 2019, and they were randomly divided into a study group and a control group, with 63 cases in each group. In the study group, there were 34 males and 29 females. 74 eyes were affected. The average age was (64.57±4.52) years, and the average course of disease was (2.18±0.26) years. According to the Emery nuclear hardness grading standard, 23 eyes with grade II nuclear 31 eyes with grade III nucleus, 20 eyes with grade IV nucleus, 62 eyes with naked eyesight above 1.0, and 12 eyes with 0.5-0.9. In the control group, there were 32 males and 31 females, 72 eyes were affected. The average age was (64.38±4.42) years old, and the average course of disease was (2.21±0.24) years. There were 21 eyes with grade II nucleus, 29 eyes with grade III nucleus, and 22 eyes with grade IV nucleus. The clinical data of the two groups of patients were not significantly different (P>0.05), and they were comparable.

Inclusion criteria

① Met the diagnostic criteria of cataract; ② Physical fitness met the requirements of surgery; ③ No history of eye diseases; ④ No related family genetic history; ⑤ This study was approved by the hospital ethics committee, and the patient and his family members were aware of the purpose and procedure of the experimental study, and signed the informed consent form.

Exclusion criteria

① Those who were allergic to the drugs used; ② Received relevant treatment within the past month; ③ Combined with Alzheimer's or had cognitive impairments such as mental disorders; ④ Patients with eye movement disorders.

Methods

Surgical methods: Both groups of patients underwent small incision phacoemulsification with topical anesthesia. The specific implementation steps are as follows. 15 minutes prior surgery, use Obucaine Hydrochloride Eye Drops (SFDA approval number: J20160094; Manufacturer: Santian Pharmaceutical (China) Co., Ltd.; Specifications: 20 ml: 80 mg) to perform topical anesthesia, create a 5-7 mm inverted brow-shaped lamellar scleral incision at about 1.5 mm from the posterior border of the limbus, perform puncture at the end of the tunnel into the anterior chamber, and inject sodium hyaluronate into it. Enlarge the incision to make the diameter of the inner mouth larger than the outer mouth, and then use the lens positioning hook and rupture needle to rotate the lens nucleus, and inject sodium hyaluronate under the nucleus to free the lens nucleus in the anterior chamber. Take out the lens nucleus and clean the remaining internal cortex, implant intraocular lens. After the operation is completed, inject 2 mg dexamethasone (SFDA approval number: H44024469; Manufacturer: Guangdong Huanan Pharmaceutical Group Co., Ltd.; Specification: 0.75 mg*100 s) into the conjunctiva.

Nursing methods: Our hospital adopted routine care measures before May 2019, and adopted comprehensive care after June 2019. Therefore, patients treated from November 2018 to May 2019 were included as control group, while those in the time frame of June 2019 to November 2019 were included as study group. The control group received routine care. The content includes preoperative physical examination, regular dressing change, noti-

fication of postoperative precautions and cataract related knowledge to prevent increased intraocular pressure.

The study group uses comprehensive care. ① Preoperative nursing care: implement clinical health education for patients, inform patients of disease-related knowledge, surgical procedures, treatment methods, etc., enable patients to actively cooperate with treatment; implement psychological care for patients, and help establish a positive treatment mentality to prepare for various preoperative and physical examination, fully grasp the patient's body and disease, pay attention to all vital signs, carefully flush the tear duct, cut the eyelashes, instruct the patient to perform eye rotation training, and inform the patient of intraoperative precautions. ② Intraoperative care: strengthen the patient intraoperative cooperation, psychological comfort after entering the operating room, eliminate preoperative tension, and ensure the smooth completion of the operation. Provide the patient oxygen to avoid hypoxia during the operation, guide the patient to use the correct eye position, and monitor the patient's various physiological indicators. Anesthesia will vary from person to person. Therefore, once the patient has a stress response, blood pressure, blood sugar, or heartbeat will increase. It is necessary to strengthen the monitoring of the patient's electrogram during operation. In case of an abnormal situation, it should be dealt with in time. Increase the dose of anesthesia appropriately according to the patient's operation time. ③ Postoperative care: the patient needs to stay in bed, and the dressing will be changed 1 day after the operation. After the check is correct, a small amount of exercise can be performed, and the patient should not be coughed or sneezing violently. Sewage or soapy water is not allowed to splash into the eyes within two weeks after the operation, and strenuous exercise is prohibited within 3 months after the operation. Follow the principle of eating multiple small meals, try to eat liquid and digestible foods to ensure smooth bowel movements.

Outcome measures

Visual acuity test: use a visual acuity chart to measure the visual acuity of the two groups of patients before and after the intervention.

Astigmatism detection: apply a corneal topography (purchased from Suzhou Kangjie Medical Co., Ltd.) to measure the astigmatism of the two groups of patients after intervention.

Refer to Self-rating Anxiety Scale (SAS) [8] and Self-Rating Depression Scale (SDS) [9] to evaluate the anxiety and depression degree of the two groups of patients before and after intervention. The SAS scale contains 20 scoring items, each of which has a full score of 5 points and with a total score of 100 points. The cut-off value is 50 points. A score <50 is considered normal, 50-59 is considered mild anxiety, and 60-69 is moderate anxiety, 70 points or more is severe anxiety; SDS scale includes 20 scoring items, with a total score of 100 points. According to the results of the Chinese norm, 53 points are used as the cut-off value, <53 is normal, 53-62 is mild depression, 63-72 is moderate depression, and over 73 is severe depression.

The *Inpatient Clinical Nursing Satisfaction Survey Questionnaire* [10] was used to evaluate the clinical nursing status of the two groups of patients, and they were divided into very satisfied, satisfied, and dissatisfied according to the degree of satisfaction; The postoperative complications of the two groups of patients were counted.

The *Cataract Knowledge Scoring Evaluation Sheet* prepared by the department was used to evaluate the cataract knowledge awareness of the two groups of patients before and after intervention. The scale includes disease knowledge, medication methods, diet management, postoperative position, personal hygiene care, etc. The full score for each item is 20 points, and the total score is 100 points. The higher the score, the better the patient's cataract knowledge.

Statistical methods

The experimental data were all statistically analyzed and processed by SPSS20.0 software. Counting data was run by x^2 test and expressed by [n (%)]. Measurement data was compared with t test and expressed by ($\bar{x}\pm s$). When $P<0.05$, the difference was statistically significant. GraphPad prism 8 software was used to plot graphics.

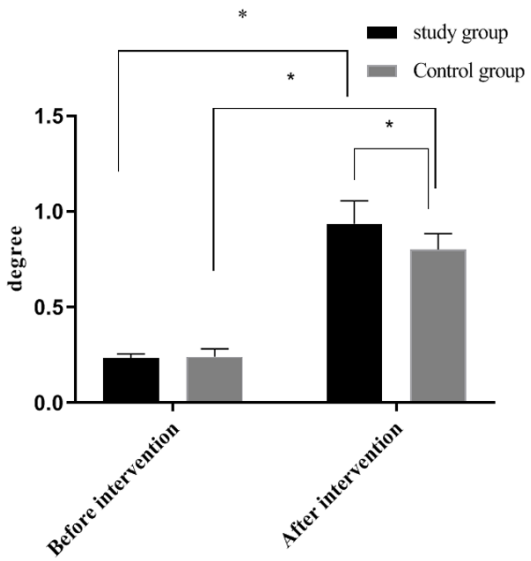

Figure 1. Comparison of vision changes between the two groups before and after intervention ($\bar{x}\pm s$). Note: The abscissa represents data before and after intervention, and the ordinate represents vision acuity (degree); The eyesight of the study group before and after intervention was (0.22±0.03) degrees and (0.85±0.17) degrees, respectively; the eyesight of the control group before and after intervention was (0.21±0.06) degrees and (0.74±0.12) degrees, respectively; The visual acuity of the study group patients before and after intervention was significantly different (t=31.394, *P<0.05); There is a significant difference in the visual acuity of the control group before and after intervention (t=33.520, *P<0.05); There is a significant difference in vision acuity between the two groups of patients after intervention (t=4.506, *P<0.05).

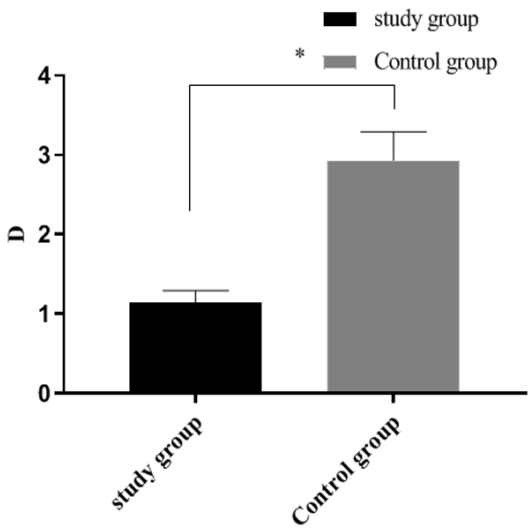

Figure 2. Comparison of astigmatism between the two groups of patients after intervention ($\bar{x}\pm s$). Note: The abscissa represents the study group and the control group, and the ordinate represents the astigmatism (D); The astigmatism of the patients in the study group after intervention was (1.03±0.22) D, and the astigmatism of the control group was (2.68±0.51) D; There is a significant difference in astigmatism between the two groups of patients after intervention (t=25.501, *P<0.05).

Results

Comparison of vision changes

The visual acuity of the two groups of patients after intervention were significantly improved (P<0.05), and the visual acuity of the patients in the study group after intervention was significantly better than that of the control group (P<0.05), as shown in **Figure 1**.

Comparison of astigmatism

After intervention, the astigmatism of the study group was significantly lower than that of the control group (P<0.05), as shown in **Figure 2**.

Comparison of SAS and SDS scores

The SDS and SAS scores of the two groups of patients after intervention were significantly lower than before the intervention (P<0.05), and the decrease of SDS and SAS scores of the study group after intervention were more remarkable (P<0.05), as shown in **Table 1**.

Comparison of clinical nursing satisfaction

The clinical nursing satisfaction of patients in the study group was significantly higher than that of the control group (P<0.05), as shown in **Table 2**.

Comparison of postoperative complications

The incidence of postoperative complications in the study group was significantly lower than that in the control group (P<0.05), as shown in **Table 3**.

Comparison of cataract knowledge scores

The cataract knowledge scores of the two groups of patients after intervention were significantly higher than those before the intervention, and the increase of cataract knowledge scores of the patients in the study group after intervention was more significant (P<0.05), as shown in **Figure 3**.

Table 1. Comparison of SDS and SAS before and after intervention ($\bar{x}\pm s$, point)

Groups	n	SDS		SAS	
		Before intervention	After intervention	Before intervention	After intervention
Study group	63	54.34±3.21	41.37±2.57	49.33±4.51	36.36±3.16
Control group	63	54.28±3.19	51.83±2.38*	49.38±4.45	43.26±3.28*

Note: The SDS and SAS scores of the two groups of patients after the intervention were significantly lower than those before the intervention. *means the comparison of the SDS and SAS scores of the two groups after the intervention, P<0.05.

Table 2. Comparison of satisfaction [n (%)]

Groups	n	Very satisfied	Satisfied	Dissatisfied	Total satisfaction
Study group	63	44 (69.84%)	17 (26.98%)	2 (3.17%)	96.82% (61/63)
Control group	63	35 (55.56%)	19 (30.16%)	9 (14.29%)	85.72% (54/63)
X^2					4.881
P					0.027

Table 3. Comparison of postoperative complications between the two groups [n (%)]

Groups	Affected eyes	corneal edema	Anterior chamber bleeding	Increased intraocular pressure	Total incidence rate
Study group	74	1 (1.35%)	0 (0.00%)	2 (2.70%)	4.05% (3/74)
Control group	72	3 (4.17%)	3 (4.17%)	4 (5.56%)	13.89% (10/72)
X^2					4.352
P					0.037

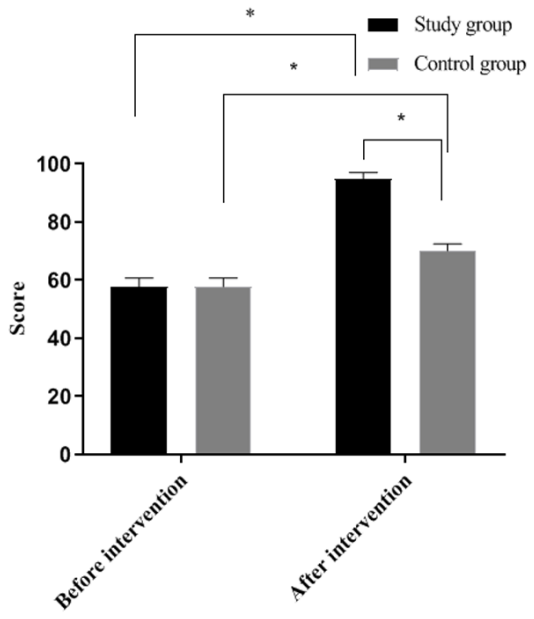

Figure 3. Comparison of cataract knowledge scores before and after intervention between the two groups ($\bar{x}\pm s$, point). Note: The abscissa represents the date before intervention and after intervention, and the ordinate represents the cataract knowledge score (points). The cataract knowledge scores of patients in the study group before and after intervention were (55.47±4.36) points and (93.23±3.17) points, respectively; the cataract knowledge scores of patients in the control group before and after intervention were (55.51±4.32) points, respectively (68.35±3.43) points; Cataract knowledge scores of patients in the study group before and after intervention are significantly different (t=55.599, *P<0.05); There is a significant difference in the scores of cataract knowledge before and after intervention in the control group (t=18.476, *P<0.05); There is a significant difference in cataract knowledge scores between the two groups after intervention (t=42.282, *P<0.05).

Discussion

In terms of surgical anesthesia, the topical anesthesia is used in phacoemulsification, with a more remarkable anesthesia effect than traditional local anesthesia. This could avoid the risk of eyeball hemorrhage and blood vessel injury caused by retrobulbar anesthesia [11-13]. Local anesthesia, which uses anesthetic drugs directly to the eyes of the patient, is more likely to cause adverse reactions such as oculocardiac reflex and has a low safety factor. It should be noted that no matter what kind of anesthesia is used, the patient's own condition must be considered. For instance, if a patient is old and psychologically stressed, it is necessary to do perioperative clinical care to ensure

the smoothness of the operation [14-16]. Patients are prone to have unhealthy emotions before and after surgery, which affects the treatment effect. Comprehensive nursing care is a systematic and comprehensive nursing service with respect to preoperative, intraoperative and postoperative nursing to meet the clinical needs of patients. Vision is the ability of the human retina to distinguish images, and it determines the quality of visual acuity. Meanwhile, vision acuity is also a key indicator for evaluating the quality of surgery and nursing care [17-19]. This study reported that the implementation of comprehensive nursing interventions for cataract patients. Such intervention can speed up the operation and recovery, while not pulling the superior rectus muscles during the operation, as well as not pressing the eyeballs. The patient's vision has improved from (0.22±0.03) degrees before the intervention to (0.85±0.17) degree after intervention, which was significantly increased (0.74±0.12) compared with the control group. Michelle Knapp et al. [20] has pointed out that senile patients with cataract and cardiovascular disease must perform physical assessment before surgery, and the use of comprehensive nursing care models can reduce the risk of surgery. In their study, the patient's vision after intervention was (0.83±0.19) degrees, which was significantly higher than (0.72±0.08) in the control group. It indicates that the comprehensive nursing care model used in phacoemulsification can effectively improve the patient's eye vision acuity and enhance the treatment effect.

Before the operation, psychological nursing care helps to eliminate the inner tension, fear and other negative emotions. If the patient cannot effectively cooperate during the operation, it is more likely to cause blepharospasm and affect the treatment efficacy. In severe cases, iris damage and posterior capsule rupture may also occur. Psychological analysis for each patient, and implement of psychological nursing care could eliminate adverse effects, encourage patients to regain confidence, and cooperate with doctors for treatment. In addition, the nursing staff should make adequate preparations for equipment and items before surgery. These include delivery of items stably, accurately, and quickly during surgery, and have a high sense of responsibility to ensure the safety of patients. However, this research was conducted as a retrospective assessment, which can be a source of bias, and additional studies are needed to confirm the findings of this study.

To conclude, the use of comprehensive nursing care during the perioperative period of small incision phacoemulsification with topical anesthesia can significantly improve the patient's vision acuity, reduce astigmatism, reduce postoperative complications, and improve clinical nursing satisfaction.

Disclosure of conflict of interest

None.

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