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Influence of Baduanjin on Prognosis of Acute Coronary Syndrome after Percutaneous Coronary Intervention

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Abstract: Objective: To study the effect of Baduanjin with acute coronary syndrome after percutaneous coronary intervention. **Method:** 60 patients with acute coronary syndrome after stenting were randomly divided into two groups (treatment group and control group). The treatment group received medication and Baduanjin treatment, while the control group received medication treatment only 6 months after, all patients received six minutes' walk test and Seattle Angina Questionnaire. **Result:** After 6 months, the treatment group was a significant difference compared with the control group on the 6MWT and SAQ($P<0.05$). **Conclusion:** Baduanjin can improve the cardiopulmonary function and quality of life of acute coronary syndrome after PCI.

Keywords: Baduanjin; Acute Coronary Syndrome; Percutaneous Coronary Intervention; Seattle Angina Questionnaire; Six Minutes' Walk Test

Introduction

Report on Cardiovascular Health and Disease in China 2019: An Update Summary shows that the number of cardiovascular diseases in China is now 330 million. The rate of serious illness and death is still on the rise [1]. Although the interventional technology of cardiovascular disease has developed rapidly, the reduction of the recurrence rate and fatality rate of cardiovascular disease is still not ideal. Because old people's body function is poor, concomitant disease is much, bringing about bad prognosis. Cardiac rehabilitation can improve the physical function of the elderly, improve postoperative anxiety, improve cardiopulmonary tolerance, reduce recurrence and mortality [2]. The traditional sports of traditional Chinese medicine have accumulated long-term practical experience. Academician Chen Keji put forward the concept of rehabilitation medicine combining traditional Chinese and Western Medicine. He developed traditional sports such as Baduanjin, Taijiquan, enriched the sports rehabilitation medical system of integrated traditional Chinese and western medicine and improved the effect of rehabilitation treatment [3]. So, we will study the recovery effect of Baduanjin with the patients after percutaneous coronary intervention of acute coronary syndrome.

1. Method

60 patients with acute coronary syndrome were hospitalized after stenting. Diagnostic criteria in accordance with Non-ST-Segment Acute Coronary Syndromes [4]. Inclusion: ① Conforms to the diagnosis of acute coronary syndromes. ② Sports rehabilitation belonged to patients with moderate to low risk. ③All participants signed informed consent. Exclusion: ①Patients with body movement disorders. ②Patients with metal disorders.③ Uncontrolled angina pectoris, heart failure,Ⅲ atrioventricular block, serious hypertension. ④ Patients after PCI belonged to high risk.

Both groups were given standardized medical treatment: aspirin 100mg qd, clopidogrel 75mg qd, rosuvastatin 10mg qn, benazepril 10mg qd, metoprolol 25mg bid. The rehabilitation exercise adopted the Baduanjin training method of General Administration of Sport of China. The patients were taught the badunjin training method through video and on-site methods before being discharged. After being discharged from the hospital, the patients practiced Baduanjin from 17:00-18:00,5 days a week, the last 6 months. The patients were asked to stop the exercise when angina occurred, arrhythmia recurred, heart

failure worsened and other bodies can't tolerate it. The 6MWT experiment and the Seattle angina scale were performed.

2. Statistical

SPSS 26.0 statistical software Processed the data. Categorical data was analyzed by the χ2 test. The difference in measurement data was compared with the test. P<0.05 were considered statistically significant.

3. Result

Comparison of general data between the two groups showed that there was no significant difference in age, sex, hypertension, diabetes, smoke, drink(Table1). While in Seattle Angina Questionnaire (SAQ) and six minutes' walk test(6MWT), the treatment group were significant differences to the control group of the 6 months(P<0.01). After treatment, the physical limitation, angina stability, angina frequency, treatment satisfaction and disease cognition of the treatment groups were significantly higher than those before treatment, while the same situation in the physical activity limitation and the anginal frequency of the control group(P<0.05). But the anginal stability, treatment satisfaction and disease cognition had no sense in the control group(P>0.05) (Table2).

Table1.Comparison of general information

	Treatment group	Control Group
Age	66.3 ± 10.94^{1}	65 ± 11.7
Sex(male)	$53.3\%^{1}$	56.7%
Hypertension	$53.3\%^{1}$	53.3%
Diabetes	$33.3\%^{1}$	40%
Smoke	$40\%^{1}$	46.7%
Drink	$16.7\%^{1}$	26.7%
1.Compare with control group P>0.05		

Table2. Comparison of Seattle Angina Questionnaire and 6MWT

Group	n	Time	Physical Limitation	Anginal Stability	Anginal Frequency	Treatment Satisfaction	Disease Cognition	6MWT
Treatment Group	30	4 weeks	43.92 ± 7.46	54.17 ± 9.48	24.33 ± 11.58	43.9 ± 11.6	34.43 ± 12.43	-
		6 months	$66.58\pm12.93^{1,3}$	$80\pm10.17^{1,3}$	$71.33\pm12.52^{1,3}$	$71.26\pm12.21^{1,3}$	$66.37\pm16.57^{1,3}$	456.43 ± 85.58^{3}
Control Group	30	4 weeks	44.92 ± 9.43	62.5 ± 12.71	32.5 ± 15.29	41.58 ± 12.07	39.36 ± 12.13	-
		6 months	48.93 ± 9.86^{1}	61.67 ± 12.69^{2}	39.67 ± 18.14^{1}	42.55 ± 11.32^{2}	41.52 ± 14.2^{2}	401.87 ± 71.49

1.Compare with same group P<0.01 2. Compare with same group P>0.05 3.Compare with control group P<0.05

4. Discussion

Baduanjin can improve cardiopulmonary exercise ability of patients with coronary heart disease after stenting, which can increase diaphragm activity and tidal volume. Baduanjin can also improve the quality of life of patients with coronary heart disease after stenting. Previous study showed that Baduanjin was a secondary preventive treatment for coronary heart disease, can reduce the recurrence of angina, improve survival rate [5]. This was consistent with our studies. Our study shows that Baduanjin can improve physical limitation, anginal stability, anginal frequency, treatment satisfaction, disease cognition of the coronary heart disease after stenting. Because after Baduanjin rehabilitation training, coronary heart disease risk factors such as lipid, blood pressure, blood glucose lever were controlled, delay the progression of coronary atherosclerosis. Secondly, after Baduanjin exercise, improved vascular endothelial function, promoted coronary collateral circulation, increased the tolerance of myocardium to hypoxia, achieved the effect of anti-myocardial ischemia.

Our study was exploring the effects of Baduanjin on cardiopulmonary function and quality of life of patients with acute coronary syndrome after PCI from the perspective of traditional Chinese medicine fitness techniques. The Baduanjin fitness method has a complete theoretical system and reliable clinical effects. The significance of our study is to integrate Baduanjin into cardiac rehabilitation, to take the road of integration of Traditional Chinese and Western medicine, to actively explore the mode of cardiac rehabilitation, and to achieve the maximum benefit of patients with myocardial infarction after PCI.

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Exploration of Vancomycin Concentrations in Cerebrospinal Fluid and Plasma after Craniocerebral Surgery

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Abstract: Patients who underwent cranial hematoma removal, extra-ventricular drainage, intracranial arteriovenous malformation resection, and other craniotomy procedures and were administered vancomycin were selected. Cerebrospinal fluid (CSF) and plasma specimens were collected simultaneously from patients at different time points using the random number method, and vancomycin concentrations in CSF and plasma were determined by enzyme amplification immunoassay. The ratio of vancomycin in CSF to plasma concentration was calculated, and the medical records were analyzed to initially investigate the relevant factors that can affect the drug concentration or blood-brain barrier. The mean plasma concentration of vancomycin was 11.87±8.5μg/mL, the CSF concentration was 2.42±1.34μg/mL, and the cerebral blood ratio was 0.28±0.21. This study suggests that the transmission rate of vancomycin did not increase significantly after craniocerebral surgery; due to individual differences, CSF and plasma concentrations vary greatly, and drug concentration monitoring is recommended.

Keywords: Blood-Brain Barrier; Enzyme Amplification Immunoassay; Blood Drug Concentration; CSF Concentration

Introduction

Intracranial infection is one of the serious comorbidities after neurosurgery, and it is also a common and more serious nosocomial infection. The most common causative organisms are gram-positive *cocci*, which account for 39.8% to 55% of cases reported in China [1]. Studies have shown that intracranial infections caused by methicillin-resistant *Staphylococcus aureus* and coagulase-negative *staphylococci* have been on the rise year by year. Vancomycin is currently the first-line conventional drug for the treatment of such bacterial infections, but the existence of the blood-brain barrier and the increase in bacterial resistance make it difficult to achieve therapeutic effects.

Vancomycin is difficult to reach the cerebrospinal fluid (CSF) through the blood-brain barrier because of its large molecular weight, strong hydrophilicity, complex structure and the lack of an active transport system for vancomycin in the brain [2]. According to the literature, neurosurgical patients have a blood-brain barrier opening factor by surgical means, and theoretically CSF penetration rate should be higher [3]. In order to verify whether the transmission rate of vancomycin through the blood-brain barrier increases when the blood-brain barrier is disrupted, CSF and plasma specimens were randomly collected from patients with craniosynostosis, and the concentration of vancomycin in CSF and plasma was determined by enzyme amplification immunoassay, and the cerebro-blood ratio was calculated to evaluate the effect of surgery on the blood-brain barrier.

1. Methods

1.1 General information of the patient

Patients requiring vancomycin after craniosurgery, requiring ventricular drainage or lumbar puncture, with normal renal function before administration, no previous chronic organ insufficiency, and no history of vancomycin allergy were selected from 2017 to 2019 in the neurosurgery, emergency surgery, and intensive care units of a hospital.

1.2 Specimen collection and concentration determination

Plasma and CSF specimens were collected at the same moment using the random number method for different patients at different time points, and 1 to 2 mL of CSF and blood were collected at 0, 0.5, 2, 4, 6, 8, 10, 12, and 14 hours after input, respectively. The concentration was determined using the Syva® drug concentration analyzer Viva-E2000. Depending on the laboratory equipment and specimen collection, the measurement was generally done within 1 month.

1.3 Statistical Methods

The obtained drug concentrations were expressed as Mean±SD; SPSS21.0 software was used for analysis, and t-test was used for measurement, with $P<0.05$ indicating statistically significant differences.

2. Results

A total of 17 patients, 7 males and 10 females, aged 54±12 years and weighing 65±8 Kg, were included in this study. 9 patients suffered from subarachnoid hemorrhage, 2 ventricular hemorrhage, 4 cerebral hemorrhage, 2 severe closed cranial injury; 8 cases had hypertension and 2 cases had diabetes mellitus; 13 cases underwent hematoma removal and 4 cases had bilateral lateral ventricular drainage; intracranial infection was diagnosed in 9 cases and undiagnosed in 8 cases. 9 cases were diagnosed with intracranial infection and 8 cases were not diagnosed with intracranial infection; CSF samples were collected by lumbar puncture in 13 cases and ventricular drainage in 4 cases.

2.1 Concentration in plasma

The highest concentration of vancomycin in plasma was 40.7 μg/mL, the lowest concentration was 3.7 μg/mL, and the mean value was 14.53 ± 10.53 μg/mL. The blood concentration showed a gradual decrease with time.

2.2 Concentration in CSF

The highest concentration of vancomycin in CSF was 11.6 μg/mL, the lowest concentration was 1.1 μg/L, and the mean value was 3.33 ± 2.76 μg/mL. The CSF concentration showed a trend of increasing and then decreasing over time.

2.3 Cerebral blood ratio

The maximum value of cerebral blood ratio was 0.62, the minimum value was 0.03, and the mean value was 0.28±0.21. Correlation analysis of cerebral blood ratio with time using SPSS showed that Pearson correlation coefficient: 0.584, P=0.028.

The bright blood ratio was positively correlated with time and had a strong correlation. The regression curve equation was $Y=0.07+0.03*X$.

3. Discussion

Among the 17 patients in this study, 7 patients improved with conventional doses of vancomycin, while only 4 patients were in a critical state, 5 in a light coma and 1 in a deep coma.

3.1 Vancomycin blood concentration after cranial surgery

The total 17 sets of data measured vancomycin T_{max} is 0.58h, C_{max} is 34μg/mL, $t_{1/2}$ is 5.33h. C_{min} is 3.7μg/mL, according to the Expert Consensus on Clinical Application of Vancomycin[4], the mean peak concentration of vancomycin is 63μg/mL at the end of titration after multiple doses of 1g 1h, vancomycin blood concentration should be clinically controlled at 10-20μg/mL, at least 10μg/mL. The peak concentration in this experiment was lower than 63 μg/mL, and the lowest concentration was not completely controlled above 10 μg/mL, which indicates that the conventional dose of drug administration may not achieve effective therapeutic effect, and the dose may have to be increased during clinical treatment, and it is recommended to monitor the drug concentration, of course, due to the limitation of sample size. This requires further expansion of the sample size for validation. The half-life of normal renal function is 4-6 h. The $t_{1/2}$ of this experiment is within the normal range. This may be related to the half-life calculated in this experiment, because the experiment was only taken once for different patients at different time points, so the half-life obtained with the time when the blood concentration dropped to half, the error is relatively large; of course, it may also be related to the sampling time error, specimen transfer storage, and other factors.

3.2 Vancomycin concentration in CSF after cranial surgery

In total, 17 sets of data were measured in which the CSF concentration C_{max}: 4.3μg/mL (8h); C_{min}: 1.1μg/mL (0h), 1.3μg/m (14h), indicating that vancomycin reached steady state in the CSF; according to previous literature [4], the concentration of CSF is 0-4μg/mL when there is no inflammation in the meninges, and the concentration can reach 6.4-11.1μg/mL when there is inflammation. 6.4 to 11.1 μg/mL, and the CSF concentrations measured in this experiment were basically in the range of 0 to 4 μg/mL, so craniotomy broke the blood-brain barrier, and the concentration of vancomycin in the CSF did not increase significantly; the standard deviation of CSF concentrations was large, indicating that the concentration of CSF caused by individual differences also varied greatly, so drug concentration monitoring should be performed; after craniotomy, intravenous drip failed to significantly increase the vancomycin concentration, so in the process of clinical treatment, for patients with serious cranial infection, intrathecal injection intrathecal injection can be used when necessary to repeatedly administer the drug in a short period of time, so that the drug can rapidly reach therapeutic concentration in the CSF [5].

3.3 Cerebral blood ratio analysis

The standardized CSF transmission rate should be calculated as the ratio of the area under the concentration-time curve of CSF to plasma drug, but because the sample size of this experiment was small and only one CSF and plasma sample was collected in each patient, the ratio of CSF concentration to plasma concentration was used to approximate the CSF transmission rate called cerebrohematocrit. The maximum value of cerebral blood ratio is 0.62, the minimum value is 0.03, and the mean value is 0.28±0.21, which indicates a great variation among individuals. According to the study, when the blood-brain barrier is disrupted, the CSF penetration rate is 22% [6], and the cerebral blood ratio in this experiment is higher than the penetration rate of this study. According to the report [6], the penetration rate of vancomycin through the CSF

increases after the blood-brain barrier is disrupted, but this is only a single factor, and when inflammation occurs after craniocerebral surgery due to the accumulation of bacterial acidic metabolites, it leads to a decrease in the pH of the CSF, causing an increase in the pH gradient of the blood CSF, while favoring the movement of antibacterial drugs into the CSF. Therefore, when craniotomy is complicated by meningitis, the transmission rate of CSF increases.

Conclusion

The results of this study indicate that the blood-brain barrier was disrupted after craniotomy, and the transmission rate of vancomycin in CSF did not increase significantly, not as much as when there was inflammation in the meninges; according to the data of this study, the plasma concentration and CSF concentration of different patients after craniotomy varied greatly, and drug concentration monitoring is recommended.

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Research Progress on Causes of Hemorrhoids in Pregnant Women and Diet Nursing

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Abstract: The incidence of hemorrhoids in pregnant women is relatively high, which generally occurs in the second trimester of pregnancy. The development of the fetus at this stage causes certain damage to the pelvic cavity, intestine, inferior vena cava, portal vein, etc., affects the venous return, and causes anal swelling and pain, bloody stool and other problems. Once women get sick in pregnancy, the treatment is more difficult, which has a greater impact on the safety of pregnant women and fetus. Studies have shown that diet has a certain impact on the occurrence of the disease, so based on the analysis of the causes of hemorrhoids in pregnant women, we should formulate a scientific diet intervention plan to improve the comprehensive intervention quality of the disease.

Keywords: Pregnant Women; Hemorrhoids; Causes of Occurrence; Diet Care

Introduction

Hemorrhoids are a soft vein mass produced by the blood stasis of the rectum and the anal plexus. The incidence rate in the population is 50-70%. It is a common disease type in the anorectal department, and can be found in all ages, which may cause certain effects on normal life. The incidence rate of hemorrhoids is significantly higher than that of non-pregnant women. This is because women need to increase the blood flow in the pelvic cavity during pregnancy to maintain the nutritional supply of the fetus. With the continuous growth of the fetus, the uterus is gradually enlarged, the pelvic cavity will be subjected to compression, and the pressure of the portal vein, inferior vena cava and intestine will increase. Venous blood return and fecal excretion will be blocked, eventually leading to the emergence of hemorrhoids. For pregnant women with hemorrhoids, the occurrence of the disease is the result of comprehensive effect, and diet nursing plays a positive role in the treatment of the disease. This paper analyzes the causes of hemorrhoids in pregnant women and the research progress of diet nursing, as follows.

1. Analysis of the causes of hemorrhoids in pregnant women

More than 70% of pregnant women are threatened by hemorrhoids. Because the rectum does not have vein valve, and it is difficult to return blood smoothly. Blood deposition will cause the vein plexus to bulge and curl up. If the external stimulation is given to pregnant women, the formation of hemorrhoids will be further promoted, including:

1.1 Physiological factors

(1) Uterine compression: during pregnancy, with the growth and development of fetus, the space needed gradually increases, and the volume of uterus increases, which causes compression to the pelvis. The venous pressure of pregnant women is in a high state, and the blood vessels are relatively relaxed. In this state, the blood flow rate of the body will slow down and cannot be returned to the heart position in time, However, the vein near anus is not smooth for a long time, and a large number of blood gathered in it will cause the vein plexus to bulge and curl up, showing swelling and swelling. Shi Wenjun [1] pointed out that the prevalence of functional constipation in pregnant women was 16.18%, which was at a high

level and needed scientific intervention.

(2) Progesterone increase: the hormone level of women during pregnancy is also changing greatly, progesterone index has significantly improved, while progesterone has a certain influence on the elasticity of vein vessels, which makes it appear a sharp decline. The incidence of varicose is significantly increased, and it is also a risk factor for hemorrhoids.

(3) Constipation: if pregnant women have long-term constipation history and poor gastrointestinal function, the symptoms are more serious in pregnancy due to their own reasons. Once defecation is not smooth, it will make efforts, then increase the venous pressure near the anus, and further aggravate hemorrhoids. Hu Liqin [2] pointed out that constipation is an important factor of hemorrhoids in pregnant women.

1.2 Environmental factors

1.2.1 Age

Women's physical function also changes with age. There are some problems in the blood flow rate, body metabolism and underlying diseases of the elderly pregnant women [3], which leads to a certain degree of increase in hemorrhoids incidence rate.

1.2.2 Pre pregnancy BMI value

If women are in the obesity stage before pregnancy, their blood viscosity is high, and fat will have a greater impact on blood circulation. At the same time, diet tends to be high in protein and fat, which increases the burden of gastrointestinal function and makes them less sensitive [4-5]. A higher BMI value will be accompanied by a higher body weight, and the pressure on the anus will increase, which will also lead to a higher incidence of disease.

1.2.3 Working factors

For some women who have been engaged in light physical labor for a long time, they are in a sedentary state for a long time, which hinders the blood circulation, causes congestion and varicose veins around the lower rectal mucosa and anus, and forms hemorrhoids [6].

2. Diet nursing measures for pregnant women with hemorrhoids

The occurrence of hemorrhoids is closely related to blood flow rate, fetal development and constipation, which can be adjusted through corresponding diet. Therefore, dietary nursing measures have a positive effect on hemorrhoids during pregnancy

2.1 Drinking honey water correctly

Pregnant women can be advised to drink 300ml warm honey water on an empty stomach every morning. Honey is a kind of material with fructose and glucose as the main components. It contains essential amino acids, protein, vitamins, etc. which has high nutritional value and has the effect of moistening intestines and defecating. Studies have shown that adults can have the problem of malabsorption of sugars after eating honey, and the incomplete absorption of fructose can improve constipation. Zhang Lili pointed out in her research that after diet nursing, the rate of no hemorrhoids in the diet intervention group (97%) was significantly higher than that in the routine nursing group (74%), which shows that diet nursing measures play a certain role in controlling the occurrence of hemorrhoids.

2.2 Moderate consumption of fruits

Pregnant women can be advised to eat fruit reasonably, and eat an apple or an appropriate amount of pitaya 30 minutes before lunch and dinner. Pitaya is a kind of fruit with low calorie and high vitamin content, which is rich in water-soluble dietary fiber. After eating, it can decompose a large number of fatty acids, lactic acid and fruit acid, promote gastrointestinal

peristalsis, and have the effect of moistening intestines and defecating; Apple is a kind of food rich in vitamins and soluble dietary fiber. It is easy to ferment bacteria in the inner colon, promote the growth of intestinal flora, and enhance the vitality of the intestinal tract, in order to promote the softening of stool, and intervene hemorrhoids. Wang Guixiu pointed out that after dietary care, pregnant women have a high score of smooth defecation, a short defecation time, a high frequency of defecation, and a low incidence of hemorrhoids.

2.3 Adjusting the diet structure appropriately

Pregnant women need to eat foods containing crude fiber during pregnancy, such as rhizomes and green leaves of plants, which can promote the peristalsis of gastrointestinal tract and soften feces. Keep a full diet of 70% full for each time to prevent the problem of over nutrition and reduce the burden of gastrointestinal tract. We should not blindly supplement nutrition. We should pay attention to the regulation of diet and maintain better gastrointestinal function. Wang Xiaoting pointed out that during the period of 12-38 weeks of pregnancy, the incidence of hemorrhoids in the diet group (2.38%) was significantly lower than that in the non-diet group (28.57%). It can be seen that diet nursing has a good preventive effect on the occurrence of hemorrhoids, which can effectively reduce the incidence.

3. Conclusion

Pregnant women are the group with high incidence rate of hemorrhoids. The causes of diseases are analyzed, including 2 aspects, physiological factors and environmental factors. Physiological factors are uterine compression, progesterone rise and constipation. The environmental factors were age, BMI before pregnancy and work. Based on the analysis of the causes of the disease, dietary intervention measures should be formulated to adjust constipation by drinking honey water correctly and eating fruits appropriately, and adjust the body circulation and gastrointestinal function by adjusting the diet structure properly, so as to realize the scientific prevention and control of the disease, and the effect is good.

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Design of a Visual Needle Searching Device in Operating Room

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Abstracts: Objective: a visual needle searching device in operating room is designed to quickly find surgical suture needles. **Method:** on the basis of referring to the current needle searching method in the operating room, the magnetic strength adjustment, data recording and export, and harmless treatment of the adsorbed suture needle are added. What is more, the functions of adjusting the total length of the telescopic connecting rod as required, rotating the telescopic connecting rod at any angle, alarm prompt after finding the sewing needle and LED lighting. **Result**: a visual needle searching device in operating room was designed, which could solve the problems that the magnetic strength of the permanent magnet of the existing needle finder was difficult to control, the electromagnet could not directly judge whether the electric energy of the battery met the use requirements, and could not record the use times, frequency and needle searching time. **Conclusion:** the visual needle searching device designed in this paper can provide a more time-saving, labor-saving, easier, more convenient and safer needle searching device for suture needle searching in the operating room, and can meet the requirements of fast work rhythm and high efficiency in the operating room.

Keywords*: Operating Room; Suture Needle; Device; Visualization*

Introduction

Surgical suture needle is the most commonly used instrument for surgical suture of patients. Surgical suture needles of different models, specifications and materials are widely used in various operations. The number of suture needles in one operation can sometimes be as many as dozens [1]; The volume of the surgical suture needle is small. Once it falls during the operation, the medical staff must stop the operation until the surgical suture needle is found to ensure that it is not left in the patient. However, the needle searching process prolongs the operation time, affects the operation process and increases the risk in the operation process of the patient [2]. An effective needle finder in the operating room is an important means to solve the problem of quickly finding falling surgical stitches, ensure surgical safety and improve the management quality of the operating room. Therefore, a visual needle finder in the operating room is designed in this paper (patent Publication No.: CN209186971U).

1. Structure and function of needle searching device in visual operating room

1.1 Structure of needle searching device in visual operating room

The needle searching device in the visual operating room is mainly composed of a base, a universal joint, a telescopic connecting rod and a controller (see Fig. 1). The base shell mechanism is equipped with needle suction disc, coil, positive and negative conductor, battery, needle storage box, elastic support, small needle suction rod, disinfection box, power switch, etc; The universal joint is connected with the base and the telescopic connecting rod, and the controller is fixed to the telescopic connecting rod through a bolt pair; The controller includes display instrument, LED lamp, magnetic strength adjustment knob, USB interface, alarm, lighting switch, etc.
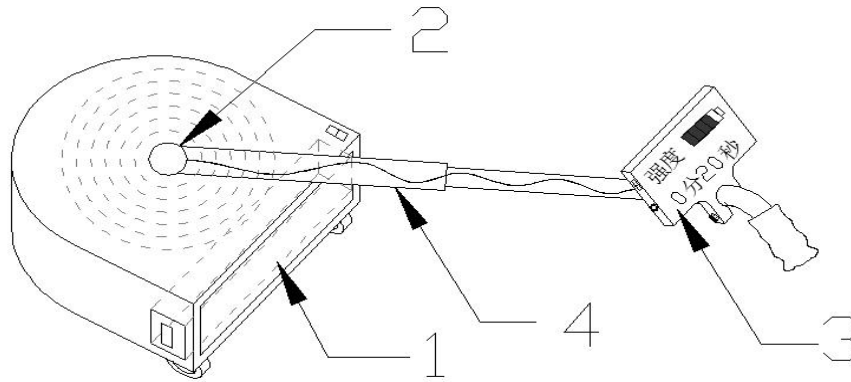
Fig. 1 Overall structure diagram of needle searching device in visual operating room
(Note: 1. Base, 2. Universal Joint, 3. Controller, 4. Telescopic Link)

1.2 Functions of needle searching device in visual operating room

1.2.1 Adjust the magnetic strength according to the size of the sewing needle and find the needle accurately

At present, there are two kinds of needle seekers in clinical use: permanent magnet and electromagnet, but both have their shortcomings. The magnetic strength of permanent magnet needle finder is difficult to control in the process of use [3]; The electromagnet needle finder cannot determine whether the electric energy of the battery meets the use requirements, and it is easy to miss the searched places due to insufficient electric energy, resulting in unnecessary expansion of the search scope and extension of the search time [4]; The needle searching device designed in this paper can adjust the resistance of the knob through the magnetic strength on the controller, and then adjust the current, so as to achieve the purpose of adjusting the magnetic strength grade of the coil, and solve the problem that the magnetic strength of the existing needle finder permanent magnet is difficult to control, so as to meet the adsorption requirements of surgical suture needles of different sizes.

1.2.2 Data recording to improve the management quality of operating room

When using the conventional needle finder, the use times, frequency and needle searching time cannot be recorded, which is not conducive to the quality management and control of the operating room. The display instrument on the controller of the needle searching device designed in this paper can display the information such as the use times of the needle searching device, battery power, needle searching time, the times of successful adsorption of sewing needles, magnetic strength, needle searching alarm and so on; Through the USB interface, the information such as the use times of needle finder and the times of successfully adsorbing suture needles can be exported in different periods for the management and analysis of the operating room, which can strengthen the quality management and control of the operating room and provide data support for the quality management and control of the operating room.

1.2.3 Harmless treatment of suture needle to avoid occupational exposure

Most of the needles dropped during the operation have already touched the blood and body fluid of the patients. When they remove the stitches adsorbed by the needle, they may be exposed to occupation injuries such as needling injuries. Especially for the needles used in the surgical patients who are diagnosed with infectious diseases or unknown infection, occupation exposure will cause great harm and pain to the needles. The visual needle searching device designed in this paper adsorbs the needle through a small needle suction rod after the needle is found, and puts it into the disinfection box in the

needle searching device for rapid disinfection, so as to achieve harmless treatment, so as to prevent unnecessary occupational exposure when taking out the contaminated needle.

1.2.4 Other auxiliary functions, showing humanization in details

When using the needle searching device designed in this paper, and the total length of the telescopic connecting rod can be adjusted to facilitate the use of the operator; The telescopic connecting rod can rotate at any angle on the base through the universal joint, so as to meet the needs of different positions; After finding the sewing needle, the alarm on the controller immediately lights up to remind the operator that the sewing needle has been found; LED lights are set under the display to meet the lighting requirements in the gaps with insufficient light, under the operating bed and under the anesthesia machine.

2. Discussion

Suture needle loss is common during operation. Researchers such as Mo Hong, Zhang Xiaoqin and Zuo Zhenfang reported the falling of suture needle from the operating table [5-7]. The main reasons why the surgical suture needle falls from the operating table are: the needle holder does not hold the suture needle in place; Improper operation of medical staff when transferring needle holder; The suture needle was placed irregularly during the operation; The friction of surgical instruments produces magnetism to remove the suture needle; New doctors, nurses and trainees are not proficient in operation [7-8]. Once the suture needle falls during the operation, the medical staff must stop the operation until the surgical suture needle is found. If it is not found after repeated times, the operation can be continued only after X-ray taken by the bedside C-arm machine to ensure that it is not left in the patient [9]. After the operation, the fallen suture needle must be found out to avoid affecting the management of the suture needle of the next operation; The needle seeking process not only prolongs the operation time and increases the risk of patients in the operation process, but also affects the mood of operators, hand washing nurses and itinerant nurses and the use frequency of the operation room.

At present, the lost suture needle is searched by some original means, such as naked eye search, simple permanent magnet and electromagnet device, and surgical towel. Because the suture needle is small, the color is not easy to identify, and the search area is large, the search process is time-consuming and laborious. Especially for places where the light source under the anesthesia machine and operating table is insufficient and the magnetic strength is difficult to reach, and it increases the difficulty of searching.

Compared with other needle searching methods, the visual needle searching device in the operating room designed in this paper increases the functions of magnetic strength adjustment, data recording and export, harmless treatment of the adsorbed suture needle, adjusting the total length of the telescopic connecting rod according to the needs, rotating the telescopic connecting rod at any angle, alarm prompt after finding the suture needle and LED lighting; It provides a more time-saving, labor-saving, easier, more convenient and safer needle searching device for suture needle searching in the operating room, so as to meet the requirements of fast work rhythm and high efficiency in the operating room.

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Observation on the Application Effect of Scene Simulation Teaching in Intensive Care of Department of Neurology

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Abstract: The purpose is to explore the application effect of scene simulation teaching in neurology intensive care. 104 nursing students who were interned in the intensive care unit of Department of Neurology of our hospital from January 2020 to April 2021 were randomly divided into control group and experimental group, with 52 in each group. Traditional nursing education was used in the control group, and scene simulation education was carried out in the experimental group. After the internship, the test scores, comprehensive ability and educational effect satisfaction of the two groups were compared. Results: the scores of clinical cases in the experimental group were significantly higher than those in the control group (P < 0.05). The total scores of nursing operation skills, emergency response ability, tacit understanding dimension, communication and cooperation of students in the experimental group were significantly higher than those in the control group (P < 0.05), and the satisfaction of the experimental group was significantly higher than that in the control group (P < 0.05). Conclusion: the implementation of scenario simulation teaching in neurology intensive care can significantly improve theoretical achievement, practical skill achievement, clinical case nursing ability and education satisfaction of nursing students in nursing department, and enhance their comprehensive ability.

Keywords: Situational Simulation Teaching; Internal Medicine-Neurology; Intensive Care; Application Effect; Observation

Introduction

Neurology is an important hospital department. Severe patients in neurology department have poor self-management ability, high requirements for nursing work and heavy workload of nurses. Pre job clinical nursing practice education can improve the level of practice and nurses' relevant professional knowledge, enhance comprehensive ability and communication ability, and effectively ensure work efficiency and quality. The traditional severe clinical nursing practice education is dominated by teachers. Teachers use the teaching method of single person narration to explain and teach relevant knowledge and operations. Students' learning enthusiasm is poor and the educational effect is not ideal. Situational simulation teaching method is a problem-oriented teaching method, which has been carried out in colleges and universities and achieved good teaching results [1]. Scene simulation teaching simulates the occurrence and development of clinical cases. Nurses operate various nursing skills through roles to obtain knowledge, improve professional skills and increase emotional experience. The situational simulation teaching method was introduced into the practical teaching of Neurology nursing.

1. Data and methods

1.1 Basic data

104 interns in the intensive care unit of the Department of Neurology of our hospital from September 2020 to June 2021 were selected as the research objects. They were randomly divided into control group and experimental group according to the digital table method, including 14 boys and 90 girls, aged from 20 to 22 years, with an average age of (21.3 ± 0.6) years. In the control group, there were 52 people, 8 boys and 44 girls, with an average age of (21.5 ± 0.5) years; in the experimental group, there were 52 people, 5 boys and 47 girls, with an average age of (21.6 ± 0.7) years. There was no

significant difference between the two groups (P > 0.05).

1.2 Method

The control group used the traditional teaching methods. The specific steps were as follows: first, the students were taught intensively according to the syllabus, and explained the relevant knowledge of Neurology through multimedia teaching methods (including teaching courseware PPT demonstration, pictures and video playback, etc.), focusing on the key and difficult points, and assigned after-school tasks. Select appropriate cases and the teaching teacher will carry out teaching rounds, and practice each item to get familiar with the knowledge points in the teaching [2].

The experimental group was divided into 13 groups. (1) Problem inspiration of situational teaching method: guide students to preview the teaching content before class, and give targeted teaching according to the students' mastery. The teaching teacher selects typical cases, carefully designs questions, arranges students to search and consult relevant materials and make PPT in groups, and the members of the group discuss according to clinical thinking in combination with the teaching materials, then the representatives from each group will speak and other group members will supplement; finally, the teacher will supplement and summarize the questions raised by the students and answer them one by one to form a more unified answer. Guide students to stay in the situation, and students can freely choose roles for cooperative exercises[3], such as: executing medical orders, interpreting various indicators of auxiliary examination, and inferring possible nursing diagnosis; quickly analyze and judge the dynamic changes of clinical manifestations, find and deal with new problems, formulate nursing objectives and implement nursing measures. The whole process is monitored by the teaching secretary or teacher. After the drill, the teaching secretary or teaching teacher commented on the whole drill process, focused on correcting the problems in the drill, and optimized nursing measures according to the photos and videos of the teaching process [4].

1.3 Observation indicators

1.3.1 The examination score test evaluated and compared the basic theoretical knowledge, clinical practice ability and learning interest of neuro-internal nursing students in the two groups.

(1) The theoretical knowledge test is randomly generated from the ICU question bank of the Department of Neurology, and the online examination of nursing world is carried out in a unified way by means of closed book measurement. The corresponding test papers are selected according to the initial, middle and later stages of the internship, and the test is carried out on Thursday of the last week after the internship of the Department, with a full score of 100 points.

(2) The practical skill test content is the practical operation content of neurology intensive care unit, with a full score of 100 points. (3) According to the evaluation of nursing ability of clinical cases, 20 operation cases were designed according to the actual clinical cases in the intensive care unit of Neurology. 3 cases were randomly selected by lot, and the average score of 3 times was taken, and each case was 100 points [5].

1.3.2 The comprehensive ability assessment test adopts the comprehensive ability assessment scale of nursing staff.

Evaluate the comprehensive ability of nursing students. The scale consists of four dimensions: skilled nursing operation, tacit understanding of work cooperation, improvement of emergency response ability and communication. Each dimension has 25 points, and the total score is 100 points. The higher is the score, the better is the comprehensive ability of nursing students.

1.3.3 The teaching effect satisfaction evaluation adopting the Chinese teaching effect satisfaction evaluation scale to evaluate the teaching effect satisfaction.

The scale consists of 7 items: establishing the overall concept of nursing, improving autonomous learning ability, improving communication ability, improving teamwork ability, improving professional identity, clarifying roles and responsibilities, and mastering nursing practice skills [6].

1.4 Statistical processing

SPSS 25.0 software was used. The measurement data were expressed as mean ± standard deviation (x ± s). The test results and comprehensive ability were tested by t. The counting data is expressed in [n (%)]. The satisfaction line was tested by χ^2. $P < 0.05$ indicates that the difference is statistically significant [7].

2. Results

2.1 Comparison of test scores

The theoretical scores, clinical case nursing ability and practical skills of nursing students in the experimental group were significantly higher than those in the control group ($P < 0.05$), as shown in **Table 1.**

Table 1. Comparison of test scores between the two groups (x ± s, score)

Group	n	Theoretical achievements	Practical skill achievement	Clinical pathology nursing ability
Experience group	52	93.59±1.72	91.48±2.65	91.37±3.28
Control group	52	81.71±2.31	79.83±3.04	80.31±2.64
T value		9.181	8.746	7.518
P		＜0.001	＜0.001	＜0.001

2.2 Comparison of comprehensive ability

The scores and total scores of skilled nursing operation, improvement of emergency ability, communication and tacit understanding of work cooperation of nursing students in the experimental group were significantly higher than those in the control group ($P < 0.05$), as shown in **Table 2.**

Group	n	Skilled nursing operation	Improvement of emergency capacity	Communication	Tacit understanding of work cooperation	Total score
Experience group	52	22.49±1.02	23.29±1.07	22.81±1.04	22.62±0.97	91.24±1.32
Control group	52	20.17±0.94	20.31±0.83	19.93±0.92	19.97±0.78	80.38±1.14
T value		7.832	8.261	7.746	7.983	9.012
P		＜0.01	＜0.01	＜0.01	＜0.01	＜0.01

Table 2. Comparison of comprehensive ability scores between the two groups (x ± s, score)

2.3 Comparison of teaching effect satisfaction

The satisfaction of the experimental group was significantly higher than that of the control group (P< 0.05), as shown in **Table 3.**

Table 3． Comparison of teaching effect satisfaction between the two groups [n (%)]

Evaluation items (satisfactory)	Experimental group (n = 52)	Control group (n = 52)	T value	P
Establish the overall concept of nursing	49（94.23）	37（71.15）	12.05	＜0.01
Improve autonomous learning ability	50（96.15）	35（67.31）	12.98	＜0.01
Improve communication skills	46（88.46）	27（51.92）	13.07	＜0.01
Improve teamwork	50（96.15）	36（69.23）	12.11	＜0.01
Improve professional identity	51（98.08）	31（59.62）	12.29	＜0.01
Clarify roles and responsibilities	48（92.31）	33（63.46）	12.86	＜0.01
Master nursing practice skills	51（98.08）	32（61.54）	12.05	＜0.01

3. Discussion

3.1 Situational simulation teaching method can improve the quality of intensive care of nursing students.

Traditional teaching is mostly taught by teachers. Students have few opportunities to practice, poor initiative, and single memory knowledge points. It is difficult to integrate the basic medical knowledge learned in the classroom with the actual clinical nursing work. Situational simulation teaching is a problem-oriented teaching method, which can combine the contents learned in the classroom with clinical practical problems, create a good teaching situation, stimulate students' interest in learning, and improve students' ability to consult and analyze problems [8]. Scenario simulation teaching can create scenarios for nursing students, compare and compare the specific cases with the learned knowledge, actively judge the similarity and difference between the problems and the learned knowledge, and correct them in time. Situational cases can enable nursing students to logically integrate basic theoretical knowledge and basic nursing operation skills, improve their diagnosis and treatment ability, and highlight the characteristics of teaching reflection. The reasoning demonstration diagram after the exercise can exercise the ability to solve clinical problems related to nursing treatment, and enable nursing students to form clinical reasoning learning awareness and thinking habits. In this study, the scores of nursing students in the experimental group were higher than those in the control group, indicating that the learning effect of nursing students in the experimental group was better in the teaching process. The reason may be related to the students' high interest in learning and providing a display platform for students to promote students to use their knowledge to reasonably solve problems [9].

3.2 Situation simulation teaching method can improve the comprehensive ability of internship and nursing intensive care

Scenario simulation teaching method is according to the teaching objectives to design problems, students-centered, students with the problem in the form of scenario simulation solution problems. It develops students' awareness and ability for lifelong learning and teamwork, and puts emphasis on developing their skills to solve practical problems. Scenario simulation teaching method is to conduct hands-on operation after the end of the theory. In the teaching process, middle school students choose role playing and simulate realistic medical scenarios to complete the nursing operation, so that students have a deeper understanding of the teaching content and are more skilled in various operations. In the process of operation, internship nursing students communicate with each other, and then solve problems, can improve the strain ability of internship nursing students. The results of this study showed that the nursing operation proficiency, emergency ability improvement, communication, tacit understanding dimension score and total score of the experimental group were significantly higher than the control group. It shows that the situational simulation teaching method can improve the comprehensive ability of internship and nursing students [10].

3.3 Scenario simulation teaching methods can improve the satisfaction of internship and nursing students

Traditional teaching methods are mostly dominated by teachers, and students passively accept the teaching content, which is easy to tire students, produce resistance, and reduce the quality of teaching. Through role playing, students simulate realistic medical scenes, while mastering knowledge points, can stimulate their innovation and thinking consciousness, increase their interest in learning, and enhance the communication between teachers and students and students. Through this study found that students are satisfied with this teaching method.

In the process of situational simulation, the teacher will give them more opportunities，but when the actual skills

operation problems and mistakes, the teacher must correct them. At the same time, in order to better play the role of protecting students, we must play a higher quality role before strengthening theoretical knowledge and practical skills, and protect students' theoretical knowledge and practical skills level.

To sum up, the implementation of situational simulation teaching methods in the intensive care teaching of neurology department can significantly improve the theoretical achievements, practical skills, clinical case nursing ability and teaching satisfaction, and strengthen the comprehensive ability, which is worthy of promotion and application.

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