

# Analysis of The Preventive Effect of Nursing Intervention on Complications After Whole Cerebral Angiography

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**Abstract:** *Objective:* To analyze the effect of nursing intervention in preventing complications after whole-brain angiography and reducing the risk of neurological dysfunction, infection, and vascular complications. *Methods:* One hundred patients who underwent whole-brain angiography in our hospital from December 2022 to December 2023 were selected and randomly divided into control and observation groups of 50 cases each. The control group received routine care, and the observation group received systematic care. The psychological status, complication rate, nursing quality, blood pressure, and nursing satisfaction of the two groups of patients were compared. *Results:* Before the intervention, there was no significant difference in psychological state between the two groups ( $P > 0.05$ ). After the intervention, the positive effect (PA) and negative effect (NA) exhibited a significant correlation between the two groups ( $P < 0.05$ ). The observation group had a lower incidence of postoperative complications as compared to the control group ( $P < 0.05$ ). The nursing quality and satisfaction of the observation group were significantly higher than those of the control group ( $P < 0.05$ ). There was no significant difference in blood pressure levels between the two groups before surgery ( $P > 0.05$ ), while during and after surgery, the blood pressure levels of the two groups of patients showed a highly significant correlation ( $P < 0.05$ ). *Conclusion:* Nursing intervention exhibited a significant preventive effect after whole-brain angiography. Scientific and reasonable nursing measures can effectively reduce the incidence of complications and improve the surgical safety and recovery of patients.

**Keywords:** Whole cerebral angiography; Nursing intervention; Complications

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## 1. Introduction

Whole-brain angiography is a standard interventional examination method to evaluate cerebrovascular structure and blood flow. It boasts significant value in diagnosing and treating various cerebrovascular diseases (CVD). Whole-brain angiography is an angiographic technique that utilizes computer-assisted imaging and is known for its comprehensive, accurate, and dynamic display of cerebral vascular structures and related lesions. Thus, it is considered the “gold standard” for diagnosing CVD<sup>[1-3]</sup>. However, since whole-brain angiography requires

puncture and arterial cannulation, it is an invasive examination, involves operational risks, and is prone to postoperative complications such as urinary retention, local hematoma, infection, and thrombosis <sup>[4]</sup>. This can seriously affect the patient's recovery and quality of life. Therefore, nursing intervention is crucial in preventing complications after whole-brain angiography. Systematic nursing is an emerging intervention model that systematizes all aspects of clinical nursing and nursing management. Its implementation process fully embodies systematicity, integrity, decision-making, and scientism. It also ensures the comprehensive improvement and continuous maintenance of nursing services <sup>[5]</sup>. Through proper nursing measures and meticulous nursing management, complications can be reduced, and the patient's surgical safety and recovery can be enhanced. However, the role and effect of nursing intervention in preventing complications after whole-brain angiography still require further in-depth research. This article aims to explore the preventive effect of nursing intervention on complications after whole-brain angiography to provide a reliable basis and guidance for clinical practice. By analyzing relevant literature and research results, we will evaluate the role of different nursing interventions in preventing complications after whole-brain angiography and provide references and suggestions for improving patients' surgical safety and recovery effects.

## **2. Materials and methods**

### **2.1. General information**

One hundred patients who underwent whole-brain angiography in our hospital from December 2022 to December 2023 were selected. The observation group consisted of 26 males and 24 females aged 38–70 years old, with an average age of  $55.62 \pm 5.85$  years. The control group consisted of 28 males and 22 females aged 39–65 years old, with an average age of  $56.24 \pm 4.13$  years. A comparison of general data between the two groups did not reveal a significant difference ( $P > 0.05$ ). Inclusion criteria: (1) Patients eligible for whole-brain angiography examination; (2) clear consciousness and can cooperate with the research; (3) consented. Exclusion criteria: (1) Patients with other serious diseases or complications; (2) patients with cognitive impairment or neurological diseases; (3) unwilling to participate in the study.

### **2.2. Method**

#### **2.2.1. Control group**

The control group received routine care, where patients received standard care procedures. The patients underwent regular monitoring of vital signs, smoothening of the respiratory tract, maintenance of body temperature, infection prevention, and other basic care measures. Postoperatively, these patients received rehabilitation and pain management, diet and fluid management, and rehabilitation coaching as usual.

#### **2.2.2. Observation group**

Patients in the observation group received nursing intervention based on the control group. A comprehensive assessment of the patients before surgery was conducted, including basic diseases, surgical risks, and drug allergies. Detailed preoperative education was provided so that patients fully understand the surgical process, precautions, and possible postoperative complications. Fluid management was carried out to ensure the patient had adequate fluid intake to maintain good blood volume and renal function. An individualized fluid management plan was developed based on the patient's condition and preoperative assessment results. Vascular protection measures were carried out by using the best techniques and instruments to reduce the risk of vascular damage during puncture and catheter insertion. The puncture site was kept clean, dry, well-secured, and sealed. For patients who have been bedridden for a long time, preventive measures were taken. The patients were

turned over regularly, pressure-reducing pads were used, and the patients engaged in timely activities to prevent the occurrence of fractures and pressure ulcers. The patient's vital signs, neurological status, and other related indicators were closely monitored. The surgical site and puncture point were regularly checked for signs of bleeding, infection, etc. Any abnormal situations were then promptly.

### 2.3. Observation indicators

Changes in the patient's mood, anxiety, depression, and other mental states were observed. The Positive and Negative Affect Schedule (PANAS) was used, including positive affect (PA) and negative affect (NA). A good mental state was indicated by a high PA score and a low NA score.

The occurrence of complications after whole-brain angiography, such as urinary retention, local hematoma, infection, and thrombosis was monitored and recorded. Complications were assessed through clinical observation, laboratory tests, and imaging tests.

Quality of care was assessed using the hospital's self-made questionnaire which covers four aspects: basic nursing, item management, specialist nursing, and nursing safety. The scoring range for a single aspect was 0–10 points. Higher scores indicate better quality of care.

The patient's blood pressure levels before, during, and after surgery were measured using a blood pressure measuring device that can record the patient's systolic and diastolic blood pressure data.

Patient satisfaction was assessed using the hospital's self-made questionnaire was used to assess, which covered the evaluation of the nursing staff's attitude, communication skills, and nursing effect.

### 2.4. Statistical methods

The SPSS 26.0 software was used for data analysis. Measurement data were expressed as mean  $\pm$  standard deviation. A two-sample mean *t*-test or chi-squared ( $\chi^2$ ) test was used to compare the two groups. Results were considered statistically significant at  $P < 0.05$ .

## 3. Results

### 3.1. Comparison of the psychological status between the two groups of patients

As shown in **Table 1**, before the intervention, there was no significant difference in the positive PA and NA scores between the two groups ( $P > 0.05$ ). After the intervention, the PA and NA scores in the observation group were higher and lower than those of the control group, respectively ( $P < 0.05$ ).

**Table 1.** Comparison of mental status scores between the two groups of patients before and after intervention (mean  $\pm$  standard deviation, points)

Group	Cases, <i>n</i>	PA rating		NA rating	
		Before intervention	After intervention	Before intervention	After intervention
Control group	50	20.23 $\pm$ 2.84	33.93 $\pm$ 4.51	38.21 $\pm$ 4.01	26.13 $\pm$ 4.04
Observation group	50	20.25 $\pm$ 2.61	40.12 $\pm$ 5.35	38.14 $\pm$ 4.16	22.06 $\pm$ 2.28
<i>t</i>		0.037	6.134	0.086	6.204
<i>P</i>		0.971	0.000	0.932	0.000

### 3.2. Comparison of the incidence of complications between the two groups of patients

As shown in **Table 2**, the incidence of postoperative complications in the control group (26%) was higher than

that in the observation group (10%), and the difference was statistically significant ( $\chi^2 = 4.151, P < 0.05$ ).

**Table 2.** Comparison of postoperative complication rates between the two groups [ $n$  (%)]

Group	Urinary retention	Local hematoma	Infection	Thrombosis	Overall complication rate
Control group ( $n = 50$ )	6	3	2	2	13 (26.00%)
Observation group ( $n = 50$ )	2	2	0	1	5 (10.00%)
$\chi^2$	-	-	-	-	4.151
$P$	-	-	-	-	0.042

### 3.3. Comparison of nursing quality levels between the two groups of patients

As shown in **Table 3**, the four scores of nursing quality in the observation group were higher than those in the control group, and the difference was statistically significant ( $P < 0.05$ ).

**Table 3.** Comparison of nursing quality levels between the two groups (mean  $\pm$  standard deviation, points)

Group	Basic care	Specialist care	Item management	Nursing safety
Control group ( $n = 50$ )	8.13 $\pm$ 0.56	8.20 $\pm$ 0.59	8.31 $\pm$ 0.60	8.36 $\pm$ 0.50
Observation group ( $n = 50$ )	9.20 $\pm$ 0.65	9.13 $\pm$ 0.61	9.43 $\pm$ 0.66	9.16 $\pm$ 0.56
$t$	8.819	7.749	8.879	7.535
$P$	0.000	0.000	0.000	0.000

### 3.4. Comparison of blood pressure levels between the two groups of patients

As shown in **Table 4**, before surgery, there was no significant difference in blood pressure levels between the two groups ( $P > 0.05$ ). The blood pressure values of the observation group during and after surgery were lower than those of the control group ( $P < 0.05$ ).

**Table 4.** Comparison of blood pressure measurement levels before, during, and after surgery between the two groups of patients (mean  $\pm$  standard deviation, kPa)

Group	Systolic blood pressure			Diastolic blood pressure		
	Preoperative	Intraoperatively	After surgery	Preoperative	Intraoperatively	After surgery
Control group ( $n = 50$ )	17.80 $\pm$ 1.25	18.40 $\pm$ 1.33	18.91 $\pm$ 1.41	10.23 $\pm$ 1.15	11.35 $\pm$ 1.25	11.83 $\pm$ 1.40
Observation group ( $n = 50$ )	17.76 $\pm$ 1.30	17.72 $\pm$ 1.36	18.12 $\pm$ 1.16	10.26 $\pm$ 1.18	10.56 $\pm$ 1.20	10.78 $\pm$ 1.32
$t$	0.157	2.528	3.060	0.129	3.224	3.859
$P$	0.876	0.013	0.003	0.898	0.002	0.001

### 3.5. Comparison of nursing satisfaction between the two groups of patients

As shown in **Table 5**, the total satisfaction rate of the observation group (94%) was significantly higher than that of the control group (74%), and the difference was statistically significant ( $\chi^2 = 7.441, P < 0.05$ ).

**Table 5.** Comparison of nursing satisfaction between the two groups [*n* (%)]

Group	Very satisfied	Generally satisfied	Not satisfied	Total satisfaction rate
Control group ( <i>n</i> = 50)	18 (36.00%)	19 (38.00%)	13 (26.00%)	37 (74.00%)
Observation group ( <i>n</i> = 50)	32 (64.00%)	15 (30.00%)	3(6.00%)	47 (94.00%)
$\chi^2$	-	-	-	7.441
<i>P</i>	-	-	-	0.006

## 4. Discussion

Whole-brain angiography is a common method to diagnose CVD and preventing postoperative complications is crucial to patient recovery and treatment outcomes. Whole-brain angiography has the advantages of a high resolution and wide clinical application. This examination process can more intuitively display the vascular lesions and locate the disease. The qualitative value is far superior to other imaging examinations such as ultrasound and computed tomography (CT) [6,7]. However, it is an invasive operation. It is relatively complex, hence some adverse effects cannot be ignored [8,9].

This study showed that as compared with the control group, the psychological state of the observation group was better, and the incidence of postoperative complications in the control group (26%) was significantly higher than that of the observation group (14%). This showed that nursing intervention significantly alleviated the patients' anxiety and reduced the incidence of postoperative complications. By implementing a series of nursing measures, such as closely monitoring the patient's vital signs, keeping the surgical area clean and dry, and regularly changing dressings, complications such as infection and bleeding can be effectively prevented. At the same time, timely nursing intervention can also quickly deal with complications that have already occurred, reduce symptoms, and shorten the course of the disease. Through nursing intervention, personalized rehabilitation guidance and psychological support can be provided, helping patients better understand and follow doctor recommendations, improve treatment compliance, and thus promote their recovery. The reason is that systematic nursing is a process verified by scientific research and practice. It abandons the ideal division of labor methods and inappropriate responsibility relationships. When it comes to the care of patients undergoing whole-brain angiography, systematic nursing can effectively predict and provide the appropriate nursing services that patients need at different stages during the examination. This reduces the stimulating effect on the patient's blood pressure level due to factors such as mood swings and improper operations, and better meets the patient's nursing needs [10].

## 5. Conclusion

Nursing intervention is important in preventing complications after whole-cerebral angiography. By implementing a series of nursing measures, the incidence of postoperative complications can be effectively reduced, the patient's blood pressure level can be controlled, the patient's treatment compliance can be improved, and the patient's recovery can be promoted. Therefore, nursing interventions should be actively used for care during clinical whole-brain angiography.

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