

Effect of Intensive Nursing on the Incidence of Thrombosis in Patients Undergoing PICC Line Placement

Aixia Li*, Anran Gao, Yuling Feng

Jiangsu Zhenjiang First People's Hospital, Zhenjiang 212004, Jiangsu Province, China

*Corresponding author: Aixia Li, 2369593873@qq.com

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Abstract: *Objective:* To explore the effect of intensive nursing on the incidence of thrombosis in patients undergoing PICC line placement. *Methods:* A total of 50 patients with tumor who underwent PICC line placement in Jiangsu Zhenjiang First People's Hospital (from January 2019 to January 2020) were randomly selected for this research. According to the random number table method, they were divided into two groups: group A (25 cases) for routine nursing and group B (25 cases) for intensive nursing. The incidence of thrombosis, coagulation indices, quality of life, and nursing satisfaction were compared between the two groups. *Results:* The incidence of thrombosis of group B was lower than that of group A, and the coagulation indices, quality of life, as well as the nursing satisfaction of group B were higher than those of group A ($P < 0.05$). *Conclusion:* Intensive nursing can effectively improve the coagulation, reduce thrombosis, and improve the quality of life of patients. The clinical application effect is remarkable, and it should be popularized.

Keywords: Intensive nursing; PICC line placement; Thrombosis

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1. Introduction

Peripherally inserted central catheter (PICC) line placement, also known as peripheral vein puncture and central vein catheterization, refers to the use of a catheter inserted into a peripheral vein at the arm and guided into a large vein close to the heart, so as to effectively avoid direct contact between chemotherapeutic drugs and peripheral veins, increase blood flow velocity, dilute chemotherapeutic drugs, and further prevent the stimulation of drugs to blood vessels ^[1]. However, thrombosis may occur during catheterization, which will affect the clinical treatment of patients. This is not conducive to the recovery of patients and will lead to poor quality of life. Therefore, one of the primary clinical problems is on how to effectively avoid the above situation. Research has shown that for patients with tumor undergoing PICC line placement, intensive nursing can effectively reduce the risk of thrombosis and improve the quality of life of patients ^[2]. Therefore, this study is carried out to explore the effect of intensive nursing on the incidence of thrombosis in patients undergoing PICC line placement.

2. Data and methods

2.1. General information

From January 2019 to January 2020, 50 patients with tumor who underwent PICC line placement in Jiangsu Zhenjiang First People's Hospital were randomly selected for this research. According to the random

number table method, the patients were divided into group A and group B. There were 25 patients in group A, including 15 male patients and 10 female patients, aged 36 to 68 years old, with an average age of 51.43 ± 6.67 years old. There were 25 patients in group B, including 14 male patients and 11 female patients, aged 37 to 69 years old, with an average age of 52.44 ± 6.65 years old. There was no significant difference between the groups ($P > 0.05$).

Inclusion criteria: (1) patients who met the PICC line placement standard; (2) patients without communication disorder, cognitive impairment, or mental history; (3) patients and their families who signed the informed consent.

Exclusion criteria: (1) patients with visceral diseases, involving the heart, liver, kidney, etc.; (2) patients with infectious diseases; (3) patients with coagulation dysfunction; (4) patients who were unwilling to cooperate and quit halfway.

2.2. Methods

Group A received routine nursing according to the following steps: first, the physical indicators of the patient should be monitored after catheterization along with the blood flow of the patient; the patient and the family members should be informed of relevant precautions.

Group B received intensive nursing according to the following steps: (1) strengthen disease monitoring; 24 hours after the completion of catheterization, the activity of the punctured arm should be restricted accordingly, the infusion speed should be strictly controlled during infusion, and the patient nor the family members should adjust without authorization; in case of physical discomfort, nursing staffs should be informed in time; on the second day after catheterization, the patient should be instructed to clench his or her fist, and any bleeding or exudation from the puncture site should be observed along with the surrounding skin in case of redness, swelling, heat, pain, etc.; the patient's arm circumference should also be measured and recorded; (2) strengthen psychological nursing; nursing staffs should explain about PICC line placement, including the process, function, and precautions of catheterization, which will improve the cognitive level of the patient and prevent negative emotions, such as anxiety and fear, from occurring; they should also communicate with the patient, try to understand the patient's emotional changes, analyze the patient's incentives, and then implement targeted psychological counseling, encourage the patient to vent out negative emotions, as well as provide mindfulness decompression therapy, so that the patient can practice mindfulness and self-regulate his or her own emotions; in addition, they can also share some successful cases to relieve the patient's psychological pressure and advice the family members to be more tolerant and understanding of the patient, avoid direct conflicts with the patient, accompany the patient more often, as well as provide necessary support and encouragement to the patient; (3) strengthen conduit maintenance; first, the infusion sequence should be reasonably arranged; that is, when administrating macromolecular drug solutions, 20 ml of sodium chloride should be used to flush after infusion, whereas when infusing nutrient solutions or blood products, sodium chloride flush should be done every 20 minutes, so as to prevent the solution from adhering to the catheter wall, which will result in catheter blockages; if blood clots are found in the catheter, they can be extracted by a syringe; the nursing staffs should also pay attention to whether the catheter is well placed so as to prevent the catheter from falling out; (4) discharge guidance; first of all, nursing staffs should explain relevant catheter maintenance methods to improve the patient's self-care ability and advice the patient to avoid large-scale movement of the arm involved, refrain from soaking and placing the catheter application during bathing, wear loose clothes as much as possible, and avoid touching the catheter when changing clothes as it might get displaced; when the patient is discharged from the hospital, health records should be established for the patient, and regular follow-up should be done by means of various channels, such as telephone, video calls, etc.

2.3. Observation indicators

(1) Incidence of thrombosis

Total incidence = (number of cases / total number of cases) × 100%

(2) Coagulation indices

The coagulation indices include D-dimer (D-D) and activated partial thromboplastin time (APTT).

(3) Quality of life

In order to measure the quality of life, the SF-36 health survey [3] was adopted, which mainly includes physical function, physiological function, mental health, social function, and emotional function, with 20 points for each item. The higher the score, the higher the quality of life.

(4) Nursing satisfaction

Using the questionnaire survey method, the evaluation criteria are as follows: the total score is 100 points, of which 90-100 points represent very satisfied, 60-90 points represent generally satisfied, and 0-60 points represent dissatisfied. Total satisfaction rate = [(very satisfied + basically satisfied) / total number of cases] × 100% [4].

2.4. Statistical analysis

SPSS 25.0 was used as the tool for statistical analysis. The measurement data were tested by *t* test and expressed in $\bar{x} \pm s$; the enumeration data were tested by X^2 test and expressed in n (%). $P < 0.05$ indicates statistically significant difference.

3. Results

3.1. Comparison of the incidence of thrombosis between group A and group B

As shown in **Table 1**, the incidence of thrombosis of group B was significantly lower than that of group A ($P < 0.05$).

Table 1. Incidence of thrombosis, n (%)

Group	Total incidence
Group A (n = 25)	6 (24.00)
Group B (n = 25)	1 (4.00)
X^2	4.152
<i>P</i> value	0.041

3.2. Comparison of coagulation indices between group A and group B

Before nursing, there was no significant difference in the coagulation indices (D-D and APTT) between the two groups ($P > 0.05$). After nursing, the D-D of group B was significantly lower than that of group A, and the APTT of group B was significantly longer than that of group A ($P < 0.05$) (**Table 2**).

Table 2. Coagulation indices ($\bar{x} \pm s$)

Group	Before nursing		After nursing	
	D-D (mg/L)	APTT (s)	D-D (mg/L)	APTT (s)
Group A (n = 25)	1.65 ± 0.14	24.24 ± 0.12	1.24 ± 0.12	28.65 ± 1.56
Group B (n = 25)	1.62 ± 0.13	24.25 ± 0.13	0.12 ± 0.02	38.56 ± 1.45
<i>t</i>	0.848	0.283	34.730	23.265
<i>P</i> value	0.401	0.779	0.000	0.000

3.3. Comparison of the quality of life between group A and group B

As shown in **Table 3**, the quality of life of group B was significantly higher than that of group A ($P < 0.05$).

Table 3. Quality of life ($\bar{x} \pm s$, points)

Group	Physical function	Physiological function	Mental health	Social function	Emotional function
Group A (n = 25)	15.61 ± 2.48	15.59 ± 2.57	15.61 ± 2.49	15.67 ± 2.35	15.59 ± 2.41
Group B (n = 25)	17.48 ± 1.25	17.45 ± 1.18	17.58 ± 1.12	17.51 ± 1.21	17.45 ± 1.23
<i>t</i>	3.367	3.289	3.608	3.481	3.437
<i>P</i> value	0.002	0.002	0.001	0.001	0.001

3.4. Comparison of the nursing satisfaction between group A and group B

As shown in **Table 4**, the total satisfaction rate of group B was 96.00%, which was significantly higher than that of group A (72.00%) ($P < 0.05$).

Table 4. Nursing satisfaction, n (%)

Group	Very satisfied	Generally satisfied	Dissatisfied	Total satisfaction rate
Group A (n = 25)	8 (32.00)	10 (40.00)	7 (28.00)	18 (72.00)
Group B (n = 25)	13 (52.00)	11 (44.00)	1 (4.00)	24 (96.00)
χ^2	-	-	-	5.357
<i>P</i> value	-	-	-	0.020

4. Discussion

Thrombosis is one of the main factors affecting the therapeutic effect of PICC line placement, which can aggravate the patient's condition and even lead to pulmonary embolism, threatening life. However, with the continuous development of medical research, some scholars have pointed out that thrombosis can be related to catheterization time, catheterization depth, catheter blockage, and other factors [5]. Therefore, during the catheterization period, it is imperative to strengthen nursing measures and catheter maintenance, so as to effectively prevent thrombosis. In order to further explore its application value, this study was carried out.

In this study, through intensive nursing intervention, the results showed that compared with group A, the incidence of thrombosis of group B was lower, the coagulation indices of group B improved significantly (D-D level of group B was lower, and the APTT time of group B was longer), the physical function, physiological function, mental health, social function, and emotional function of group B were higher, and the nursing satisfaction was also higher in group B, indicating that the application effect of intensive nursing is ideal.

By monitoring the patients' vital signs and related indicators, nursing staffs can timely gauge the patients' physical conditions and changes in their condition after catheterization; in addition, they can also observe the changes in the blood flow of the patients, so as to prevent thrombosis. By strengthening psychological nursing, the patients are given the opportunity to understand more about PICC line placement and build a sense of trust toward the nursing staffs. Moreover, by giving certain psychological counseling to patients, it increases patients' enthusiasm for treatment, so as to effectively improve clinical treatment and nursing compliance. By strengthening catheter maintenance, catheter blockage and shedding can be avoided, thus preventing thrombosis. Other than that, discharge guidance can effectively improve patients'

self-care ability and self-management ability, and through follow-up, doctors can monitor the condition of the patients even after discharge. In addition, corresponding nursing guidance can be given to patients after discharge to actively help them solve problems and difficulties, so as to effectively avert improper catheter maintenance and prevent thrombosis after discharge. Therefore, intensive nursing and conventional nursing can effectively prevent thrombosis, resulting in a positive effect on clinical treatment, increase the satisfaction of patients toward the nursing staffs, improve the quality and efficiency of nursing, maximize the satisfaction of patients' nursing needs, provide patients with better nursing services, and improve the physical and mental health of patients as well as the quality of life of patients.

In conclusion, intensive nursing can improve the coagulation function of patients, reduce thrombosis, and improve the quality of life of patients. The effect is ideal, and it has high clinical application value; thus, it should be popularized.

Project

Effect of Arm Manipulation Based on Interactive Reaching Theory on Limb Function of Patients with PICC Catheterization.

Disclosure statement

The authors declare no conflict of interest.

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