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Investigation on the early-stage nursing intervention for deep venous thrombosis in traumatic fracture senile patients in perioperative period.

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Abstract

Objective: To investigate the clinical efficacy of early-stage nursing intervention for deep venous thrombosis in senile patients with traumatic fracture during perioperative period.
Methods: We selected a total of 62 senile patients with traumatic fracture who were admitted to this hospital for treatment between June 2016 and June 2017. These patients were divided into two groups: the control group and experimental group. Conventional nursing strategy was implemented for patients in the control group, while those in the experiment group received the early-stage nursing intervention, then the nursing efficacy were compared between the two groups.
Results: At 6 h and 4th day after surgery, the D-dimer level in plasma of patients in the experiment group was higher than that in the control group ($p<0.05$); after nursing intervention, the incidence rate, VAS scores and total satisfaction rate of nursing strategy were all better than those in the control group, and the differences had statistical significance ($p<0.05$).
Conclusion: In this study, the early-stage nursing intervention for deep venous thrombosis in senile patients with traumatic fracture gained significant clinical efficacy. Thus, early-stage nursing intervention is worthy being promoted in clinical practice.

Keywords: Senile traumatic fracture, Perioperative deep venous thrombosis, Early-stage nursing intervention.

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Introduction

Deep venous thrombosis (DVT) is part of a spectrum of venous thromboembolic disorders that includes superficial thrombophlebitis and pulmonary embolism. DVT may be defined as "the abnormal coagulation of blood within a deep vein" [1-3]. Although DVT most commonly occurs in the deep veins of the lower leg and thigh, it may also occur within the upper limb deep veins, visceral veins, and even the vena cava [4]. The estimated risk for first time venous thromboembolism (VTE) is 100 cases per 100,000 persons per year, yielding an annual incidence of 0.1% and generating an annual US incidence of over 1 million patients per year [5]. In recent years, with the promotion and application of surgical treatment in China, the incidence rate of deep venous thrombosis has been increasing, which has severely affect the postoperative recovery of patients [1-3]. In this study, we evaluated clinical efficacy of early-stage nursing strategy for senile patients with traumatic fracture, and the results are summarized as follows.

Subjects and Methods

Subjects

A total of 62 senile patients with traumatic fracture were admitted to this hospital for treatment between June 2016 and June 2017, and those patients were divided into two groups according to the difference in nursing strategy, i.e. the control group (n=31) and experimental group (n=31). In the control group, there were 17 males and 14 females; the age ranged from 63 to 82 years old with an average of (69 ± 0.36) years old; as for the fracture causes, there were 9 cases caused by traffic accident, 6 by falling injury, 7 by falling accidents, 5 by crushing and 4 by other causes; in terms of the fracture type, there were 6 cases with intertrochanteric fracture, 11 with fracture of femur neck, 10 with fracture of femoral shaft and 4 with fracture of tibia and fibula. Remaining 31 patients underwent early-stage nursing intervention: There were 16 males and 17 females; the age ranged from 61 to 83 years old with an average of (68 ± 0.19) years old; as for the fracture causes, there were 8 cases caused by traffic accident, 5 by falling injury, 8 by falling accidents, 7 by crushing and 3 by other causes; in terms of the fracture type, there were 8 cases with intertrochanteric fracture, 9 with fracture of femur neck, 8 with fracture of femoral shaft and 6 with fracture of tibia and

fibula. Comparisons of the gender ratio and age of patients between the two groups showed no statistically significant differences (p>0.05), indicating that these patients were eligible for following studies.

Inclusion and exclusion criteria

This study had been approved by the Ethic Committee of the hospital, and the patients and their family had signed the written informed consent. The patients complicated with coagulation disorders, or severe dysfunctions in heart, liver or kidney, or a history of cerebral infarction, pulmonary infection, hypertension, or deep venous thrombosis were excluded from the current study.

Nursing strategy

Regular nursing strategy, including the health education, closely monitoring the vital signs of patients and correcting the bad habits of patients, were adopted for control group. For the conventional nursing strategy, patients in the experiment group also received the early-stage nursing intervention, including the following rules:

(1) **Recording of preoperative nursing care:** Before surgery, nurses stipulated the nursing protocol according to the condition of patients. During the recovery period, nurses provided patients with appropriate guidance for exercise of lower limbs and rational diet to improve the anemia and increase the immunity and resistance to diseases.

(2) **Intraoperative nursing care:** Since there was a variety of underlying diseases in senile patients with traumatic fracture, nurses should inform the physicians of cardiovascular diseases in those patients, and cooperate with them during surgery, thereby shortening the surgical duration to avoid the poor blood flow due to the prolonged duration; if the surgical duration could not be shortened, nurses should timely adjust the position of patients before surgery with the foot being slight lifted, and surgical treatment could begin only after patients maintained this position for 1 min, aiming to sustain the smooth blood flow.

(3) **Postoperative nursing care:** After the vital signs of patients were stabilized, nurses should guide the patients to exercise off-bed early, thereby restoring the blood circulations in limbs; if appropriate, nurses could message the limbs of patients to promote the venous return and reduce the incidence of deep venous thrombosis; simultaneously, nurses should timely correct the bad habits of patients by appropriate exercise, rational diet and keeping glad. In addition, nadroparin calcium or aspirin could be given to the patients following the physician's advice for prophylaxis of deep venous thrombosis; the condition of patients should be carefully assessed, and for patients at a higher risk of deep venous thrombosis, nurses could use the compression stockings or other devices to improve the prophylactic effectiveness.

Efficiency evaluation

(1) At admission, the day of surgery, 6 h after surgery and 4th day after surgery, the fasting venous blood was drawn from patients for detecting the D-D level *via* automatic analyzer and immunity detector;

(2) Recording the nursing care and incidences of complication of patients in two groups, including: lower extremities swelling and deep venous thrombosis.

(3) VAS was adopted for assessment of pains in patients before and after nursing care in two groups, in which 0 point for painless and 10 for acute pains [6-8].

(4) Satisfaction questionnaire designed by us was used to evaluate the satisfaction of patients on nursing care in both groups with a total score of 100 points, in which scores not less than 86 points, very satisfied, scores between 65 and 85 points, satisfied, and scores less than 65 points, unsatisfied.

Statistical processing

All data in this study were summarized for statistical analysis *via* SPSS 19.0 with an inspection level of α=0.05. p<0.05 suggested that the difference had statistical significance. Enumeration data were presented as n or percentage, and chi-square test was performed for comparison of these data; measurement data were presented as mean ± standard deviation, and t test was performed for comparison.

Results

Comparison of the D-D levels between the two groups

At admission and surgery day, there was no statistically significant differences in comparison of the D-D levels between the two groups (p>0.05); after nursing intervention, D-D levels at 6 h and 4th day after surgery in the experiment group were lower than those in the control group, and the differences had statistical significance (p<0.05; Table 1).

Table 1. *Comparison of D-D levels between the two groups ($\bar{x}$ ± s).*

Group	At admission	Surgery data	At 6 h after surgery	At 4th day after surgery
Experiment group	1.17 ± 0.32	1.23 ± 0.36	1.41 ± 0.82*	1.43 ± 0.36*
Control group	1.18 ± 0.47	1.22 ± 0.17	1.69 ± 0.36	1.72 ± 0.11
t	-0.0989	0.1398	-7.9579	-4.2893
P	0.1616	0.0715	0.0258	0.0457

Note: *p<0.05 *vs.* control group.

Comparison of the incidence of complications between the two groups

In the experimental group, after nursing intervention, there was 1 case with lower extremities swelling and 2 with deep venous thrombosis, and the incidence rate was 9.68%; in the control

group, after nursing intervention, there were 4 cases with lower extremities swelling and 7 with deep venous thrombosis, and the incidence rate was 35.48%. Results showed that there was a statistically significant difference (χ^2=4.7692, p=0.0289).

Comparison of VAS scores between the two groups

Before nursing intervention, VAS scores of the experiment group and the control group were (6.41 ± 0.25) points and (6.23 ± 0.19) points, and the difference had no statistical significance (p>0.05); after nursing intervention, those scores were (3.02 ± 0.15) points and (4.93 ± 0.36) points, showing that the VAS score was significantly decreased, and the difference in comparison with the score before nursing intervention had statistical significance (p<0.05); in addition, after nursing intervention, the VAS score in the experiment group was superior to that in the control group, and difference had statistical significance (t=0.6325, p=0.0361).

Comparison of satisfaction on nursing care between the two groups

After nursing intervention, the total satisfaction rate of nursing care in the experiment was 93.55%, significantly higher than that in the control group (70.97%), and the difference had statistical significance (p<0.05; Table 2).

Table 2. *Comparison of satisfaction rates on nursing care between two groups (n/%).*

Group	Case (n)	Very satisfied	Satisfied	Unsatisfied	Total satisfaction rate (%)
Experiment group	31	18 (58.06)	11 (35.48)	2 (6.45)	93.55*
Control group	31	12 (38.71)	10 (32.26)	9 (29.03)	70.97
X2	-	-	-	-	5.4153
p	-	-	-	-	0.0199

Note: Total satisfaction rate=($n_{very\ satisfied}$+$n_{satisfied}$)/n × 100%; *p<0.05 *vs.* control group.

Discussion

Traumatic fracture is a common disease in orthopedics and frequently occurs in elder population. Surgical treatment is the major method for senile traumatic fracture, but usually leads to a high viscosity in blood flow, subsequently with blood flow slowing down and finally inducing the deep venous thrombosis [9-11]. Previous studies indicated that there are 250000 new cases of deep venous thrombosis every year, and this number keeps increasing [12-14]. Although anticoagulant therapy is effective in prophylaxis of deep venous thrombosis, there remain tremendous obstacles in single medication for prophylaxis due to the complex underlying diseases, poor ability in complaint and surgical stress [15]. Early-stage nursing intervention is a kind of scientific and effective prophylactic nursing method. This kind of nursing intervention is designed to identify the population at a high risk of deep venous thrombosis *via* evaluating the clinical manifestation and pathogenesis of patients, and to provide specific and integrated nursing measures to ameliorate the venous return and eliminate the inducing factors of venous thrombosis. The aim of this intervention is to decrease the incidence rate of complications, alleviate the pains of patients and improve the doctor-patient relationship [16]. In this study, we applied the early-stage nursing intervention in senile patients with traumatic fracture in perioperative period, and found that after nursing intervention, the incidence rate of complications was 9.68%, significantly lower than that in control group (35.48%), and the difference between two group had statistical significance (p<0.05). Our results further showed that after nursing intervention, the VAS scores and total satisfaction rate on nursing care in the experiment group were higher than those in the control group, and the differences had statistical significance (p<0.05), suggesting that early-stage nursing intervention can effectively decrease the thrombosis, and further reduce the incidence rate of deep venous thrombosis. Moreover, the pains in patients could also be alleviated, and this could contribute to the amelioration in doctor-patient relationship. D-D is an indicator of thrombosis and secondary hyperfibrinolysis in patients. In this study, the D-D levels at 6 h and 4th day after surgery in the experiment group was higher than that in the control group (p<0.05), which is consistent with the results of Guan et al. [17]. Thus, the application of early-stage nursing intervention in perioperative period of senile patients with traumatic fracture can effectively prevent the thrombosis, and thereby promote the recovery of patients.

Conclusive Remarks

In conclusion, early-stage nursing intervention for senile patients with traumatic fracture in perioperative period can decrease the incidence rate of deep venous thrombosis effectively, so as to alleviate the pains of patients and ameliorate the doctor-patient relationship. Thus, it is worthy being promoted in clinical practice.

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