The Role and Safety of Personalized Care in Improving Thrombocytopenia after Lymphoma Chemotherapy

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Abstract: *Objective:* To explore and analyze the effect and safety of personalized nursing in improving thrombocytopenia after lymphoma chemotherapy. *Methods:* 80 lymphoma patients with thrombocytopenia after lymphoma chemotherapy in the Department of Hematology of our hospital from May 2021 to May 2023 were selected as the research objects, and they were divided into an experimental group and reference group by random drawing, with 40 cases in each group. The experimental group received individualized nursing, and the reference group received routine nursing. The platelet count, platelet-related indicators, incidence of adverse reactions, and life scores were compared between the two groups. *Results:* Before the intervention, there was no significant difference in platelet count between the groups ($P > 0.05$); after the intervention, the platelet count in the experimental group was significantly higher compared to the reference group ($P < 0.05$). In the experimental group, the duration for platelet decline and the time for platelets to normalize were notably shorter compared to the reference group ($P < 0.05$). Moreover, the personality group displayed a significantly lower incidence of adverse reactions than the reference group ($P < 0.05$). Prior to the intervention, there were no statistically significant differences ($P > 0.05$) in the life scores between the two groups, such as functional condition, symptom manifestation, and health scores among the groups. However, post-intervention, the personality group exhibited a significant improvement in those scores compared to the reference group ($P < 0.05$). *Conclusion:* Individualized nursing can optimize the platelet level in thrombocytopenia after lymphoma chemotherapy, improve symptoms, and reduce the occurrence of adverse reactions.

Keywords: Individualized care; Lymphoma chemotherapy; Thrombocytopenia; Safety; Effect

1. Introduction

Lymphoma is a tumor that occurs in the lymph. Lymph nodes and lymphoid tissues are widely distributed, so the disease can occur in any part of the body, and its symptoms are also very diverse [1,2]. Lymphoma is a malignant tumor, and it is usually treated by chemotherapy. Chemotherapy drugs are harmful to a certain extent and might cause some adverse reactions. Thrombocytopenia is a relatively common adverse reaction [3,4]. Thrombocytopenia is a condition in which the blood platelet content is lower than normal, leading to skin and mucous membrane bleeding. Nursing interventions for thrombocytopenia in lymphoma patients during chemotherapy can improve prognosis. Personalized nursing, based on individual patient needs, tailors nursing plans and targeted measures accordingly [7]. This article aims to study and analyze the effect and safety of personalized nursing in improving thrombocytopenia after lymphoma chemotherapy.

2. General information

Eighty patients with thrombocytopenia after lymphoma chemotherapy who were treated in the Department of Hematology of our hospital from May 2021–May 2023 were taken as research objects for this study. The patients were divided into an experimental group and a reference group by random drawing, 40 cases in each group. There were 21 males and 19 females in the experimental group, aged 24–65 years (average age: 44.29 ± 1.35 years old). There were 22 males and 18 females in the experimental group, aged 243–65 years (average age: 44.42 ± 1.16 years old). There was no statistically significant difference ($P > 0.05$) in the general information between the groups.

Inclusion criteria: (1) Diagnosed with thrombocytopenia after chemotherapy for lymphoma; (2) no mental illness; (3) compliant.

Exclusion criteria: (1) Presence of coagulation abnormalities, (2) history of cardiovascular and cerebrovascular diseases. (3) organ failure.

3. Methods

The reference group received routine nursing, where the changes in the patient's condition was observed, and the patients were given instruction in terms of medication and diet.

Individualized nursing: (1) Disease education: the background of the patients were understood and the severity of the disease was assessed. Then, the patients were educated on chemotherapy, the adverse reactions after chemotherapy, and the diagnosis and treatment of thrombocytopenia, so that they have a correct understanding of the disease. (2) Emotional management: Patients are prone to negative emotions in the face of malignant tumors, chemotherapy, and complications. Therefore, they were given some consolation and encouragement so that they can face the disease optimistically. (3) Bleeding intervention: Thrombocytopenia can cause skin and mucous membrane bleeding. Therefore, the patient's skin and mucous membrane conditions were assessed. Patients with bleeding signs were told to rest in bed and their skin and mucous membrane conditions were monitored. The use hot towels or hot water bottles was prohibited. Heat was applied to the skin, and the patients were given a light diet with more fruits and vegetables. For patients with constipation, cathartic drugs can be given appropriately to prevent bleeding caused by defecation. (4) Anti-infection measures: Chemotherapy can weaken patients' immunity, increasing the infection risk. Therefore, prevention measures were taken, which involved cleaning the patient's skin, respiratory tract, oral cavity, and perianal area. The patients were given a potassium permanganate sitz baths after defecation. Besides, strict sterile techniques were followed during nursing procedures to minimize the possibility of an infection. (5) Platelet transfusion:

The activity of platelets can be maintained *in vitro* for 7 days. In cases where immediate transfusion was not possible, storage in a controlled environment was necessary, with intermittent shaking every five minutes to preserve platelet function. Before infusion, gentle shaking was advised to prevent platelet structure damage, and the infusion was recommended to be completed within 60 minutes.

3.1. Observation indicators

(1) Platelet counts.
(2) Platelet-related indicators: time taken for the platelets to decrease to the desired level.
(3) The incidence of adverse reactions, including nausea and vomiting, chest tightness, skin ecchymosis, and infection.
(4) Scores for functional conditions, symptom manifestations, and health, ranging from 0 to 100 points.

3.2. Statistical analysis

SPSS 21.0 was used to process and analyze the data, the count data were expressed by the number of cases (n) and percentage (%), the x^2 test was implemented, the measurement data were expressed by the mean ± standard deviation, and the t test was implemented, ($P < 0.05$) were considered statistically significant.

4. Results

4.1. Comparison of platelet counts between the experimental group and reference group

Before the intervention, there was no statistically significant difference in platelet count between the groups ($P > 0.05$); after the intervention, the platelet count in the experimental group was higher than that in the reference group ($P < 0.05$), and the difference was statistically significant. See **Table 1** for details.

Table 1. The comparison of platelet counts between groups is as follows (mean ± standard deviation, ×10^9/L)

Group	Number of cases	Before intervention	After intervention
Experimental group	40	44.28 ± 4.61	119.27 ± 8.64
Reference group	40	44.38 ± 4.69	105.42 ± 7.32
x^2	–	0.0961	7.7353
P	–	0.9236	0.0000

4.2. Comparison of platelet-related indicators between the experimental group and the reference group

The duration of platelet reduction in the personality group and the time for the platelets to reach the standard were significantly lower than those in the reference group ($P < 0.05$), and the difference was statistically significant. See **Table 2** for details.

Table 2. The comparison of platelet-related indicators between groups (mean ± standard deviation)

Group	Number of cases	Thrombocytopenia duration	Platelets up to standard all time
Experimental group	40	4.18 ± 1.24	7.61 ± 2.51
Reference group	40	6.37 ± 1.55	12.96 ± 2.27
x^2	–	6.9778	9.9982
P	–	0.0000	0.0000

4.3. Comparison of the incidence of adverse reactions between the personality group and the reference group

The incidence of adverse reactions in the personality group was significantly lower than that in the reference group ($P < 0.05$), and the difference was statistically significant (**Table 3**).

Table 3. The incidence of adverse reactions between groups is compared as follows (n [%])

Group	Number of cases	Nausea and vomiting	Chest tightness	Skin ecchymosis	Infection	Total incidence
Experimental group	40	2 (5.00)	0 (0.00)	1 (2.50)	1 (2.50)	4 (10.00)
Reference group	40	4 (10.00)	2 (5.00)	3 (7.50)	3 (7.50)	12 (30.00)
x^2	-	-	-	-	-	5.0000
P	-	-	-	-	-	0.0253

4.4. Comparison of life scores between groups

Before the intervention, there was no statistically significant difference ($P > 0.05$) in the life scores such as functional conditions, symptom manifestations, and health score among the groups. After the intervention, the life scores of the personality group were significantly better than in the reference group ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of life scores between groups (mean ± standard deviation)

Group	Number of cases	Functional situation		Symptoms		Fitness level	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Experimental group	40	69.21 ± 5.28	82.67 ± 5.64	65.27 ± 5.55	80.24 ± 5.67	66.27 ± 5.31	82.57 ± 5.26
Reference group	40	69.36 ± 5.33	72.51 ± 5.94	65.43 ± 5.69	70.33 ± 5.24	66.52 ± 5.41	73.21 ± 5.29
x^2	-	0.1264	7.8448	0.1273	8.1181	0.2085	7.9353
P	-	0.8997	0.0000	0.8990	0.0000	0.8353	0.0000

5. Conclusion

Lymphoma, a malignant lymphatic tumor, can infiltrate various human organs and typically presents with prominent symptoms such as weight loss, night sweats, and fever [8]. There are two types of lymphoma: Hodgkin's lymphoma and non-Hodgkin's lymphoma, among which Hodgkin's lymphoma has a very good prognosis and is a curable tumor [9]. Chemotherapy is the main method to treat this disease, but it can cause adverse reactions, with thrombocytopenia being one of them. Once thrombocytopenia occurs in chemotherapy patients with lymphoma, the treatment of the disease will be delayed. Some patients need to prolong the time of chemotherapy, and some patients need to terminate chemotherapy [10]. The prevention and treatment of thrombocytopenia are very important. Proper nursing can control thrombocytopenia to a certain extent and improve the prognosis of lymphoma patients with chemotherapy [11]. In order to provide patients with a better clinical nursing experience, the nursing model is constantly updated and improved [12,13]. Personalized nursing is a relatively popular nursing model. Basic nursing measures are used as the cornerstone, and nursing measures are optimized on this basis. Different patients have different needs and conditions. Therefore, the nursing plan should be adjusted according to the condition of the patient. In this way, thrombocytopenia due to lymphoma chemotherapy can be better treated and controlled [14-15].

To sum up, the platelet count of patients with thrombocytopenia after chemotherapy for lymphoma can recover to a certain extent through individualized nursing. Besides the occurrence of adverse reactions can be reduced, thus improving the patient's quality of life. Therefore, individualized nursing program should be popularized in clinical practices.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Zhai P, Zhai W, Huang Y, *et al.*, 2023, Construction of TCM Quality of Life Scale for Children with Chronic Immune Thrombocytopenia Based on Delphi Method. Journal of Tianjin University of Traditional Chinese Medicine, 42(03): 317–321.

[2] Zhao H, Wang W, 2023, Nursing Research on the Treatment of Immune Thrombocytopenic Purpura with Traditional Chinese Medicine Yuzu Prescription (Xiaodianling) Combined with Syndrome Differentiation and Nursing of Traditional Chinese Medicine. Sichuan Traditional Chinese Medicine, 41(05): 212–215.

[3] Wang H, Ma X, 2022, Effect of Nursing Risk Management on Thromboelastographic Parameters and Prognosis of High-Dose Methylprednisolone Treatment of Children with Idiopathic Thrombocytopenic Purpura. Thrombosis and Hemostasis, 28(01): 152–154.

[4] Gao Y, 2021, Study on the Effect of Whole-Course Nursing Intervention on the Effect and Compliance of Hormone Therapy in Children with Immune Thrombocytopenic Purpura. Contemporary Clinical Medicine, 34(05): 54-55 + 41.

[5] Wang C, 2021, The Clinical Efficacy of Comprehensive Nursing Intervention Combined with Jianpi Huoxue Decoction on Thrombocytopenia and the Influence of Serological Indicators in Patients. Practical Chinese Medicine Journal, 35(10): 83–86.

[6] Yu Y, Zhang X, Lin G, *et al.*, 2021, The Impact of Comprehensive Intervention on The Clinical Effect and Quality of Life of Patients with Immune Thrombocytopenia Drug Therapy. Chinese Medicine Herald, 18(07): 185–188.

[7] Zhang L, 2020, Effect of Nursing Measures on Thrombocytopenia After Intra-Aortic Balloon Pump Implantation in Patients with Acute Myocardial Infarction. Chinese Journal of Metallurgical Industry Medicine, 37(05): 602.

[8] Xiang F, 2020, The Effect of Nursing Intervention on the Clinical Efficacy and Safety of High-Dose Methylprednisolone in the Treatment of Children with Idiopathic Thrombocytopenic Purpura. Journal of Clinical Rational Drug Use, 13(26): 123–124.

[9] Lian R, Feng X, Li G, *et al.*, 2020, Research on the Effect of Full-Course Seamless Nursing on the Compliance of Hormone Therapy in Children with Idiopathic Thrombocytopenic Purpura. Medical Diet Therapy and Health, 18(15): 155 + 157.

[10] Fan L, 2020, Nursing Effect Observation of High-Dose Gamma Globulin Combined with Glucocorticoids on Idiopathic Thrombocytopenic Purpura. Electronic Journal of Cardiovascular Diseases of Integrated Traditional Chinese and Western Medicine, 8(08): 162–163.

[11] Guo Y, 2020, Study on the Effect of Evidence-Based Nursing on Quality of Life and Sleep in Patients with Thrombotic Thrombocytopenic Purpura Treated with Plasma Exchange. Chinese and Foreign Medicine, 39(01): 135–137.

[12] Gong H, Wang Z, 2019, The Effect of Recombinant Human Thrombopoietin in the Treatment of Thrombocytopenia During Pregnancy and its Influence on Interleukin and Interferon. Chinese Journal of Family Planning, 27(12): 1652–1655.

[13] Wang G, Ma H, Zhao J, 2019, Observation on the Effect of Recombinant Human Thrombopoietin Therapy for Thrombocytopenia after Chemotherapy in Acute Leukemia. Electronic Journal of Clinical Medicine Literature, 6(82): 52.

[14] Guo J, Liu L, Zhang L, *et al.*, 2019, Application of Cluster Nursing in a Case of Acute Myeloid Leukemia Relapsed After Microtransplantation and Allogeneic Hematopoietic Stem Cell Transplantation. Chinese Medicine and Clinic, 19(14): 2464–2465.

[15] Zhang Y, Shen X, 2019, Observation on the Preventive Effect of Empathic Nursing on Postoperative Complications of Laparoscopic Surgery in Patients with Refractory Thrombocytopenic Purpura. Wisdom Health, 5(12): 109–110.