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Original Article

Effect of nursing risk management on treatment compliance and family psychological status in pediatric patients with idiopathic thrombocytopenic purpura

Dan Chen, Wei Zhang

Department of Pediatrics, The Affiliated Huaian No. 1 People's Hospital of Nanjing Medical University, Huaian 223300, Jiangsu, China

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Abstract: Objective: To investigate the impact of nursing risk management on treatment adherence and family psychological status in pediatric idiopathic thrombocytopenic purpura (ITP). Methods: In this retrospective study, a total of 102 children with ITP admitted to Affiliated Huaian No. 1 People's Hospital of Nanjing Medical University from January 2021 to March 2024 were selected as the research subjects and divided into two groups according to the order of admission and the different nursing protocols, with 50 cases in the control group (routine nursing management) and 52 cases in the observation group (risk management along with routine nursing care). Comparisons were made between the two groups of children in terms of treatment adherence, symptom improvement after intervention, time to symptom relief, length of hospitalization, platelet counts, incidence of rebleeding, family psychological status, and family satisfaction with care. Results: The compliance in the observation group was significantly higher than that in the control group ($P<0.05$). The scores of hemacelinosis, hemorrhage, and febrile symptoms in both groups at 7 days after admission were notably lower than those at admission (all $P<0.05$), with the observation group showing significantly lower scores than the control group ($P<0.05$). The duration of symptom relief and the length of hospitalization in the observation group were considerably shorter than those in the control group ($P<0.05$). The incidence of platelet counts below 50×10^9/L three months after discharge and the incidence of rebleeding in the observation group were significantly lower than those in the control group ($P<0.05$). Three months after discharge, the families in both groups showed significant reductions in anxiety and depression compared to admission ($P<0.05$), with the observation group showing milder negative emotions than the control group ($P<0.05$). The overall satisfaction rate in the observation group was higher than that of the control group ($P<0.05$). Conclusion: Nursing risk management improves treatment adherence in pediatric ITP, reduces negative emotions in families, and increases family satisfaction with care.

Keywords: Management of nursing risks, idiopathic thrombocytopenic hemacelinosis in children, treatment compliance, prognosis

Introduction

Idiopathic thrombocytopenic purpura (ITP) is one of the most common bleeding disorders in childhood. It is a self-limiting immune disease characterized by immune-mediated thrombocytopenia, accounting for approximately 25.1% of hemorrhagic diseases in Chinese children [1, 2]. Children with ITP typically present with spontaneous skin and mucous membrane bleeding, thrombocytopenia, prolonged bleeding time, and poor clot retraction, all of which can lead to life-threatening hemorrhaging in children [3]. The pathogenesis of ITP has not been fully elucidated, with varying incidence rates across different populations. Studies suggest that the pathogenesis of ITP may involve humoral immunity, cellular immunity, and viral infections [4, 5]. The primary treatment for children with ITP includes immunoglobulin and glucocorticoids. However, recurrence of bleeding symptoms and recurrent episodes of disease, coupled with the need for prolonged glucocorticoid use, can adversely affect metabolic and immune functions of the children, potentially leading to negative psychological emotions such as fear and anxiety in both the children and their families, thereby affecting their compliance with disease

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treatment [6, 7]. While there are currently many clinical reports on the treatment of ITP in children, fewer focus on improving clinical outcomes through enhanced nursing management. Current care for ITP is mostly routine care, including symptom management, complication prevention, and psychological support, but it lacks individualized care, adequate support from families and society, and proper safety management. To enhance treatment compliance and clinical prognosis of children with ITP, it is essential to strengthen nursing care during treatment. This study aims to explore the influence of nursing risk management on treatment compliance and the prognosis of pediatric IPT.

Information and methods

Clinical data

We selected 102 children with ITP admitted to Affiliated Huaian No. 1 People's Hospital of Nanjing Medical University from January 2021 to March 2024 and divided them into two groups according to the order of admission and the different nursing protocols, with 50 cases in the control group (routine nursing management) and 52 cases in the observation group (risk management along with routine nursing care). The study was approved by the Ethics Committee of Affiliated Huaian No. 1 People's Hospital of Nanjing Medical University.

Inclusion criteria

(1) The children met the diagnostic criteria for ITP in the Chinese Expert Consensus on the Diagnosis and Treatment of Thrombotic Thrombocytopenic Hemacelinosis [8]. Children with clinical symptoms such as skin, mucosa and nasal bleeding, fever and hemacelinosis; PLT< 100×10^9/L; normal or increased bone marrow macrophages, with a higher proportion of immature or mature non-secreted macrophages. (2) The children were aged between 1 month and 14 years.

Exclusion criteria

(1) Children with a bleeding disorder other than ITP; (2) Children with concurrent acute or chronic infectious diseases; (3) Children with an intracranial hemorrhage or gastrointestinal hemorrhage; (4) Children with systemic lupus erythematosus; (5) Children with allergies; (6) Children with comorbid psychiatric disorders; (7) Children with pseudothrombocytopenia due to multiple causes.

Methods

The control group received the routine nursing treatment regimen, and the observation group was given a risk management regimen in addition to the routine nursing care. Risk elements in the treatment of children with ITP were screened, including the risks associated with the child's placement at the clinic, self-related factors, lack of disease knowledge by the child and/or family, non-compliance with treatment and care, and improper operations by nursing staff. Targeted nursing risk management measures were implemented based on the abovementioned risk factors, with details as follows: (1) Placement at the clinic: After consultation, the child's vital signs and blood work were closely monitored. If a child with a platelet (PLT) count of less than 10×10^9/L was identified, the child was promptly transferred to the emergency department. The attending physician was immediately informed of the child's condition, and timely treatment was provided to minimize the risk of improper placement. (2) Self-related factors: Due to the sudden onset of ITP and pronounced bleeding symptoms, both children and their families often experience significant tension and fear. Nursing staff provided psychological support to stabilize their emotions, helping them confront the disease with a positive mindset. Additionally, the basic care of children after admission was enhanced. The child was advised to minimize activities and maintain bed rest when necessary. Appropriate temperature and ventilation in the ward was maintained. (3) Lack of disease knowledge: Health education was provided to the child or (and) their family by medical staff. Nursing staff thoroughly explained the disease and medication regimen, emphasizing the importance of adherence to treatment for recovery. Information on potential complications and treatment strategies was communicated to ensure that the child and family maintain a positive attitude toward treatment. (4) Non-compliance with treatment and care: Health education and psychological care were reinforced for the child and/or family members. The importance of active participation in treatment was emphasized to reduce risks. If treatment compliance decreases, nursing staff

engaged in timely communication with the child and family to improve adherence. (5) Improper operations by nursing staff: An ITP nursing risk management team was established within the department, focusing on strengthening professional knowledge and operational skills. Regular assessments were conducted to enhance the competency of nursing staff and reduce operational risks. (6) Poor parental care after hospital discharge: Discharge health education was provided to the child or (and) parents. After discharge, continuous nursing interventions were carried out, with weekly follow-ups via WeChat to monitor the child's condition, address questions from the family, and guide proper medication usage.

Observation of indicators

(1) Compliance with treatment: Treatment adherence was measured using a treatment adherence questionnaire [9] three months after discharge. Completely compliant: fully followed medical advice and treatment regimen; Partially compliant: partially followed medical advice and treatment regimen; Completely non-compliant: did not follow medical advice and treatment regimen. Compliance rate = (Number of cases with full compliance + number of cases with partial compliance)/total number of cases × 100%.

(2) Improvement of symptoms: Clinical symptoms were scored at admission and on day 7 after admission. The ITP Symptom Scoring Scale was used to evaluate symptoms of hemacelinosis, hemorrhage, and fever. Hemacelinosis and bleeding were scored as mild (2 points), moderate (4 points), and severe (6 points), while fever was scored as mild (1 point), moderate (2 points), and severe (3 points) [9].

(3) Duration of symptom relief and hospital stay: The time to symptom relief and the length of hospitalization were recorded and compared between the two groups.

(4) Comparison of platelet counts and incidence of rebleeding: Platelet counts below 50×10^9/L and the incidence of rebleeding were compared three months after discharge in both groups.

(5) Psychological state of families: Family members' psychological states were assessed using the Self-Assessment Scale for Anxiety (SAS) and the Self-Depression Scale (SDS) at admission and three months after discharge [10, 11]. According to the Chinese normative results, the cut-off value of the SAS was 50, with higher scores indicating a more severe anxiety, and the cut-off value of the SDS was 53, with higher scores indicating a more severe depression.

(6) Satisfaction of families: Family satisfaction was evaluated using a hospital-developed questionnaire, with scores ranging from 0 to 100. Scores of 80-100 indicated great satisfaction, 60-79 indicated satisfaction, and <60 indicated dissatisfaction.

(7) Incidence of nursing risk events: The incidence of nursing risk events in both groups was recorded and compared.

Statistical analysis

SPSS 27.0 was used for statistical analysis. The measurement data was expressed as ($\overline{x}$ ±s), and the counting data was expressed as percentage. The comparison of measurement data between groups was conducted using *t*-test, comparison of count data was done by Chi-square Test, and comparison of rank data was performed by rank-sum test. The difference was statistically significant at $P<0.05$.

Results

Comparison of clinical data between the two groups

There were no significant differences between the two groups in terms of gender, age, duration of disease, or platelet counts (all P>0.05), as shown in **Table 1**.

Comparison of treatment adherence between the two groups

In the observation group, 37 cases were completely compliant (71.15%), 13 cases were partially compliant (25.00%), and 2 cases were completely non-compliant (3.85%), yielding a compliance rate of 96.15%. In the control group, there were 24 cases of complete compliance (48.00%), 17 cases of partial compliance (34.00%) and 9 cases of complete non-compliance (18.00%), with a compliance rate of 82.00%. The compliance rate of the observa-

Table 1. Comparison of clinical data between the two groups

Group	Number of cases	Gender		Age (years, $\bar{x}\pm s$)	Course of disease (weeks, $\bar{x}\pm s$)	Platelet count ($\times 10^9$/L, $\bar{x}\pm s$)
		Male	Female			
Observation Group	52	21	31	7.34±1.98	3.84±0.78	17.84±5.35
Control Group	50	18	32	7.64±2.01	3.91±0.81	18.39±6.32
t/X^2	-	0.208		0.759	0.445	0.475
P	-	0.649		0.450	0.658	0.636

Table 2. Comparison of treatment compliance between the two groups [n (%)]

Group	Number of cases	Completely compliant	Partially compliant	Completely non-compliant	Compliance rate (%)
Observation Group	52	37 (71.15)	13 (25.00)	2 (3.85)	96.15
Control Group	50	24 (48.00)	17 (34.00)	9 (18.00)	82.00
Z/X^2	-		Z=2.631		5.308
P	-		0.009		0.021

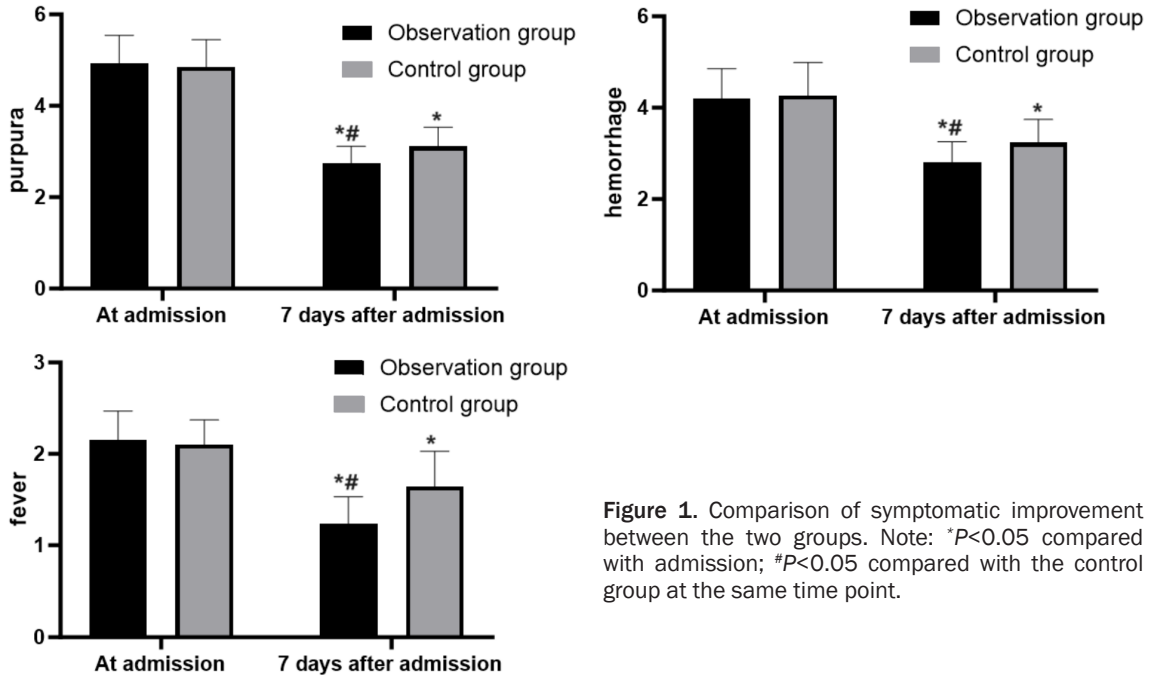

Figure 1. Comparison of symptomatic improvement between the two groups. Note: *$^*P$<0.05 compared with admission; $^{\#}P$<0.05 compared with the control group at the same time point.

tion group was significantly higher than that of the control group (P<0.05) (**Table 2**).

Comparison of symptom improvement between the two groups

The scores of hemacelinosis, hemorrhage, and febrile symptoms were significantly decreased in both groups at 7 days post-admission (all P<0.05). Furthermore, the symptom scores for hemacelinosis, hemorrhage, and being febrile were significantly lower in the observation group than those in the control group (all P<0.05) (**Figure 1**).

Comparison of overall symptom remission time and hospital stay between the two groups

The time to symptom relief and the length of hospitalization were significantly shorter in the observation group than those in the control group (P<0.05) (**Figure 2**).

Comparison of platelet counts and incidence of rebleeding between the two groups

Three months after discharge, the incidence of platelet counts below 50×10^9/L and the incidence of rebleeding were remarkably lower in

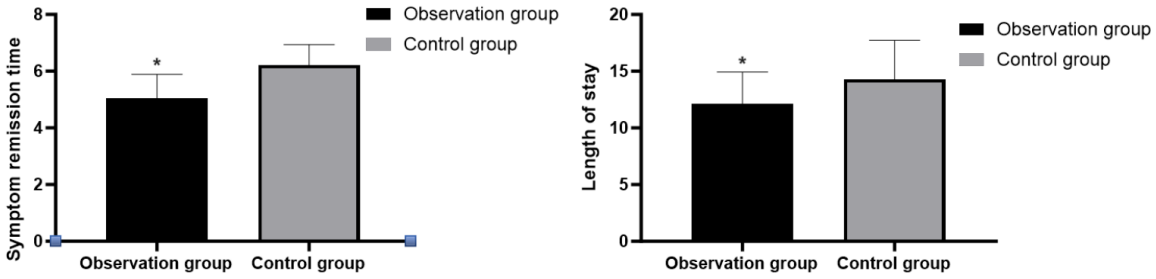

Figure 2. Comparison of time to symptom relief and hospitalization time. Note: Compared with the control group, *P<0.05.

Table 3. Comparison of platelet count and incidence of rebleeding between the two groups [n (%)]

Group	Number of cases	Cases with platelet count below 50×10^9/L	Cases with rebleeding
Observation Group	52	2	4
Control Group	50	10	11
X^2	-	6.408	4.160
P	-	0.011	0.041

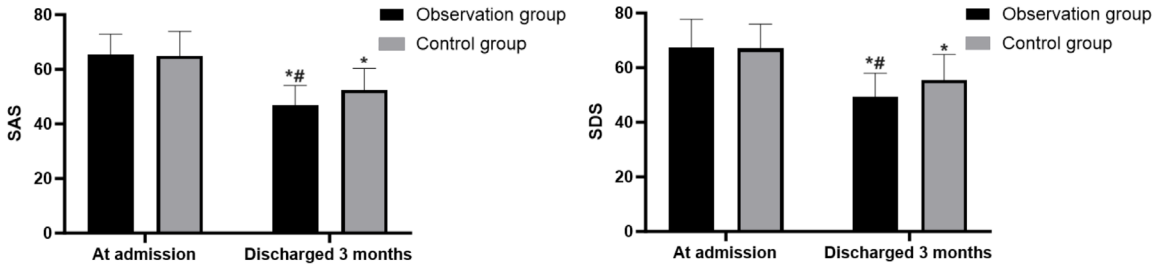

Figure 3. Comparison of the psychological status of the families. Note: *P<0.05 compared with admission; #P<0.05 compared with the control group at the same time point.

Table 4. Comparison of family satisfaction with nursing care between the two groups

Group	Number of cases	Great satisfaction	Satisfaction	Dissatisfaction	Satisfaction rate (%)
Observation Group	52	41 (78.85)	10 (19.23)	1 (1.92)	98.08
Control Group	50	26 (52.00)	16 (32.00)	8 (16.00)	84.00
Z/X^2	-		Z=3.050		4.651
P	-		0.002		0.031

observation group compared to the control group (P<0.05) (**Table 3**).

Comparison of family members' psychological status between the two groups

The levels of anxiety and depression in the families in both groups were apparently lower three months after discharge than those at the time of admission (P<0.05), with significantly lower levels in the observation group than those in the control group (P<0.05) (**Figure 3**).

Comparison of nursing satisfaction between the two groups

The overall satisfaction rate of the family members with nursing care in the observation group was significantly higher than that in the control group (P<0.05) (**Table 4**).

Comparison of nursing risks and complications between the two groups

Both groups of children did not experience any major nursing risk events, but the incidence of

Table 5. Comparison of incidence of complications between the two groups [n (%)]

Group	Number of cases	Infection	Dysglycemia	Nausea and vomiting	Total
Observation Group	52	1 (1.92)	0 (0.00)	1 (1.92)	2 (3.85)
Control Group	50	3 (6.00)	2 (4.00)	4 (8.00)	9 (18.00)
X^2	-	-	-	-	5.308
P	-	-	-	-	0.021

complications in the observation group was significantly lower than that in the control group ($P<0.05$) (**Table 5**).

Discussion

Immune Thrombocytopenic Purpura (ITP) is an organ-specific autoimmune hemorrhagic disease characterized by a high incidence and recurrence rate. Its main clinical symptoms include spontaneous bleeding, thrombocytopenia, and skin purpura [12, 13]. In addition, some children with ITP may experience abdominal pain, arthralgia, and kidney damage, which seriously affect their health and safety [14, 15]. Thrombocytopenia can result from hereditary conditions, infectious diseases, hematopoietic stem cell lesions, bone marrow infiltrative diseases, or physicochemical factors, as well as certain diseases that increase the destruction of platelets [16-18]. The onset of ITP in children is often insidious, initially presenting with minor bleeding spots on the gums and skin. As the disease progresses, children may develop chills and fever, and the skin and mucous membranes may show widespread purpura or even large petechiae [19-22]. Mucosal bleeding is commonly seen in the nasal cavity, and blood blisters may appear in the oral cavity and gums, which increases the risk of bleeding. Therefore, implementing a scientific and effective risk management approach for children with ITP is particularly critical [23-25].

The nursing risk management model implemented in this study is tailored to the modern nursing discipline [26, 27]. We screened various risk elements for children with ITP during their treatment process, including risks associated with in clinic placement, self-related factors, lack of disease knowledge among the child or (and) family, non-cooperation with treatment and care, improper handling by caregivers, and improper post-discharge care by nursing parents. Targeted nursing risk management measures were then implemented to address these identified risks.

This study found that the compliance rate in the observation group was significantly higher than that in the control group, indicating that nursing risk management improved children's adherence to treatment. This could be attributed to the strengthened psychological support provided to children, as well as educating them and their families on the importance of active cooperation with treatment, which contributed to better treatment compliance [28-30]. Moreover, the scores of purpura, hemorrhage and fever symptoms in the observation group were significantly lower than those in the control group, suggesting that nursing risk management effectively improved these symptoms. The duration of symptom remission and hospital stay in the observation group were also significantly shorter than those in the control group, highlighting the positive impact of nursing risk management on the children's recovery time [31, 32]. Furthermore, three months after discharge, the incidences of platelet counts below 50×10^9/L and rebleeding in the observation group were significantly lower than those in the control group, demonstrating that risk management helped mitigate platelet count decline and rebleeding [33]. Three months after discharge, the anxiety and depression levels of the families in the observation group were obviously lower than those in control group, and their total satisfaction rate with nursing care was higher. This suggests that nursing risk management not only reduced the anxiety and depression of family members but also improved their satisfaction with nursing care, which is consistent with a previous report [34]. This improvement can be attributed to reducing the risks associated with a lack of disease knowledge and improper care after discharge, ultimately fostering better family outcomes [35, 36].

Conclusion

In summary, risk management improves treatment adherence in pediatric ITP patients, alleviates negative emotions in their families, and

increases family satisfaction with care, deserving wide clinical application.

Disclosure of conflict of interest

None.

Address correspondence to: Dan Chen, Department of Pediatrics, The Affiliated Huaian No. 1 People's Hospital of Nanjing Medical University, No. 1 Huanghe West Road, Huaiyin District, Huaian 223300, Jiangsu, China. Tel: +86-0517-80872301; E-mail: chendan1120@tom.com

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