Original Article

Clinical nursing pathway in the treatment of patients with maintenance hemodialysis and its effects on satisfaction and complications

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Abstract: Objective: To analyze the effects of clinical nursing pathway (CNP) on satisfaction and complications of patients with maintenance hemodialysis (MHD). Methods: One hundred and twelve patients with MHD were randomly selected and divided into a control group (receiving routine nursing) and a study group (receiving CNP), with 56 patients in both groups. The two groups of patients were statistically compared in terms of nursing satisfaction, compliance behavior, complications, psychological states, hospitalization expenses and quality of life. Results: Compared with the control group, patients in the study group had significantly higher nursing satisfaction, better compliance behavior, lower incidence of complications, lower Self-Rating Depression Scale and Self-Rating Anxiety Scale scores after nursing, lower hospitalization expenses and higher quality of life score (all P<0.05). Conclusion: For patients with MHD, CNP can reduce the incidence of complications, regulate negative emotions and improve compliance behavior, quality of life and prognosis.

Keywords: Clinical nursing pathway, maintenance hemodialysis, satisfaction, complication

Introduction

Maintenance hemodialysis (MHD) clinically treats chronic renal failure and relieves patient’s conditions, with a lasting time for more than 6 months or even up to 1-5 years. Patients with MHD are much more likely to suffer from ascites, seroperitoneum, left heart insufficiency, renal osteopathy, hypertension and anemia, exposing them to physical and psychological damage [1, 2]. Traditional nursing is limited by being fixed, passive and a single model of treatment. Nursing personnel who tend to treat passively can ignore the mental and psychological care of patients, which easily leads to nurse-patient disputes.

Clinical nursing pathway (CNP) refers to a nursing model developed by members of the clinical pathway development team based on an individual’s operation, disease or diagnosis. In the treatment and nursing processes standardized by clinical nursing path list, patients are treated from hospitalization to discharge [3]. In a study by Liu, the incidence of complications was 11.5% in the observation group (receiving CNP), lower than that in the control group (37.1%; receiving routine nursing), indicating that CNP has high safety and can reduce the incidence of complications in MHD [4]. In the context of the above research, the purpose of this study is to explore the effect of CNP on maintenance hemodialysis patients.

Materials and methods

Baseline information

Altogether 112 patients with MHD admitted to Beijing Luhe Hospital from October 2016 to October 2018 were selected and divided into the study and control groups (n = 56 per group), see Table 1.

Inclusion criteria: Patients (1) who were sane and conscious; (2) with time of hemodialysis ≥3 months; (3) or families were informed and signed an “informed consent form”; (4) who met indications for MHD; (5) with stable conditions and without complications related to brain, lung and kidney.
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Exclusion criteria: (1) Lactating and pregnant women. (2) Those complicated with heart failure, malignant tumors and respiratory failure. (3) Those with depression and schizophrenia. (4) Those with endocrine and metabolic diseases. (5) Those complicated with diseases of blood and immune systems. (6) Those complicated with sepsis and burns. (7) Those complicated with tuberculosis and chronic hepatitis. (8) Those with acute infection within 2 the previous weeks.

Methods

Routine nursing was performed on patients in the control group for 1 month, including monitoring of patients’ conditions and vital signs, explanation of MHD knowledge (principles, purposes, functions, matters needing attention, etc.) to patients, treatment methods, nursing countermeasures, treatment based on doctors’ advice, routine diet guidance and exercise guidance.

CNP was performed on patients in the study group for 1 month: (1) Preparation before nursing. A professional blood purification center was formed, and the nursing team consisted of attending physicians, charge nurses and head nurses, all of whom were professionally trained and allowed to perform nursing plans only after passing the examination [5]. (2) Formulation of CNP. A specific schedule was made accordingly, using time as the horizontal axis and using admission guidance, treatment, nursing, medication, examination, diet guidance, and discharge plan as the vertical axis, respectively. The members searched for literature about the nursing of MHD, consulted relevant data and formulated targeted nursing plans according to the specific conditions of the wards, hospitals and patients [6]. (3) Implementation of CNP. 1) On admission: The nursing personnel carefully introduced the specific environment for diagnosis and treatment to patients on admission, and answered questions plainly so as to help patients know more about their own diseases [7]. 2) The nursing personnel assisted patients to complete examinations, meanwhile patiently explained the necessity of the examinations to them, with the examination time reasonably arranged. 3) A hemodialysis machine (FRESENIUS 4008S/B, Fresenius Medical Care (Shanghai) Co., Ltd. GAMBRO AK96/98; GAMBRO LUNDA MONITOR DIVISION) was used for hemodialysis. Before hemodialysis, the nursing personnel patiently explained the necessity and purposes of hemodialysis to patients plainly, so as to minimize their worries and get their cooperation and approval. 4) During hemodialysis: in addition to monitoring their vital signs, the nursing personnel closely observed on patients’ arteriovenous internal fistula to judge whether there was errhysis and to ensure smooth blood flow [8]. 5) After hemodialysis: The needle was pulled out immediately after hemodialysis, and the puncture was pressed to prevent hemorrhage and fistula embolization. Then patients without adverse reactions were sent to the ward. Skin where the fistula was established was cleaned and applied with erythromycin ointment or hirudoid to improve the softness [9]. 6) When patients were sent to the ward, the nursing personnel carefully observed whether the puncture site was red and swollen to make sure the clearness of the arteriovenous fistula. Dressings at the puncture site

Table 1. Comparison of baseline information (x ± sd)

<table>
<thead>
<tr>
<th></th>
<th>Study group (n = 56)</th>
<th>Control group (n = 56)</th>
<th>x²/t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>36</td>
<td>34</td>
<td>0.1524</td>
<td>0.6963</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average age</td>
<td>53.6 ± 5.0</td>
<td>53.8 ± 5.1</td>
<td>0.2096</td>
<td>0.8344</td>
</tr>
<tr>
<td>Average time of hemodialysis</td>
<td>8.1 ± 1.1</td>
<td>8.1 ± 1.2</td>
<td>0.0000</td>
<td>1.000</td>
</tr>
<tr>
<td>Average weight</td>
<td>66.52 ± 4.17</td>
<td>66.86 ± 4.11</td>
<td>0.4346</td>
<td>0.6647</td>
</tr>
<tr>
<td>Primary diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purpura nephritis</td>
<td>10</td>
<td>12</td>
<td>0.2263</td>
<td>0.6343</td>
</tr>
<tr>
<td>Lupus nephritis</td>
<td>12</td>
<td>11</td>
<td>0.0547</td>
<td>0.8151</td>
</tr>
<tr>
<td>Diabetic Nephropathy</td>
<td>15</td>
<td>14</td>
<td>0.0465</td>
<td>0.8292</td>
</tr>
<tr>
<td>Hypertensive nephropathy</td>
<td>11</td>
<td>12</td>
<td>0.0547</td>
<td>0.8151</td>
</tr>
<tr>
<td>Chronic glomerulo nephritis</td>
<td>8</td>
<td>7</td>
<td>0.0770</td>
<td>0.7814</td>
</tr>
</tbody>
</table>
were changed in time to guarantee local blood circulation. Additionally, patients were advised to wear loose clothes and not to wear gloves and bracelets, and not lift weights using the arm where the fistula was established [10]. 7) Before discharge: The nursing personnel emphasized the necessity of establishing arteriovenous fistula to patients, guided them to master protective measures of the fistula, and encouraged them to form healthy lifestyles.

Observational indexes and evaluation standards

The two groups of patients were statistically compared in terms of nursing satisfaction, compliance behavior, complications, psychological states and quality of life.

Questionnaires with a total score of 100 points made by the department were used to evaluate the nursing satisfaction. Very satisfied: ≥80 points; Satisfied: <79 points and ≥60 points; Dissatisfied: ≤59 points. The overall satisfaction = the number of very satisfied and satisfied cases/the total number of cases.

Compliance behavior was evaluated with respect to self-psychological adjustment, correct medication, regular movement and reasonable diet, which was statistically analyzed and compared in terms of corresponding proportions.

Incidence of complications included incidence of aneurysm, hemorrhage, infection and thrombosis.

Short form 36 questionnaire (SF-36) with a total score of 100 points was used to evaluate quality of life, which included social, physical, emotional, perception and role functions. The score was directly proportional to quality of life [12].

Statistical methods

SPSS 26.0 was used to analyze the data. Measurement data were expressed by mean ± standard deviation (X ± sd) and analyzed by t test. Count data were expressed by the number of cases/percentage (n/%) and tested by χ². P<0.05 indicated a significant difference.

Results

Comparison of baseline information

There were no significant differences between the two groups in terms of gender, primary diseases, time of hemodialysis, body weight and age (all P>0.05). See Table 1.

Comparison of nursing satisfaction

The nursing satisfaction in the study group was significantly higher than that in the control group (P<0.05). See Table 2.

Comparison of incidence of complications

The incidence of complications in the study group was significantly lower than that in the control group (all P<0.05). See Table 3.

<table>
<thead>
<tr>
<th>Study group</th>
<th>Control group</th>
<th>χ²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>23 (41.07)</td>
<td>15 (26.79)</td>
<td>0.8374</td>
</tr>
<tr>
<td>Satisfied</td>
<td>31 (55.36)</td>
<td>27 (48.21)</td>
<td>0.8374</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>2 (3.57)</td>
<td>14 (25.00)</td>
<td>3.0826</td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>54 (96.43)</td>
<td>42 (75.00)</td>
<td>9.9864</td>
</tr>
</tbody>
</table>

| Aneurysm | 1 (1.79) | 4 (7.14) | 0.8374 | 0.3601 |
| Hemorrhage | 1 (1.79) | 4 (7.14) | 0.8374 | 0.3601 |
| Infection | 0 (0.00) | 3 (5.36) | 3.0826 | 0.0791 |
| Thrombus | 0 (0.00) | 4 (7.14) | 4.1481 | 0.0417 |
| Incidence of complications | 2 (3.57) | 15 (26.79) | 9.9864 | 0.0006 |

Psychological states: Self-Rating Depression Scale (SDS) was used to evaluate depression before and after nursing. No depression: <50 points; Mild depression: 50-59 points; Moderate depression: 60-69 points; Severe depression: ≥70 points. Self-Rating Anxiety Scale (SAS) was used to evaluate anxiety before and after nursing. No anxiety: ≤49 points; Mild anxiety: 50-59 points; Moderate anxiety: 60-69 points; Severe anxiety: ≥70 points [11].
Comparison of compliance behavior

The compliance behavior in the study group was significantly higher than that in the control group (all \( P < 0.05 \)). See Table 4 and Figure 1.

Comparison of SAS scores and SDS scores

Before nursing, there were no significant differences between the two groups in SDS and SAS scores (both \( P > 0.05 \)). However, after nursing SDS and SAS scores in the study group were significantly lower than those in the control group (both \( P < 0.05 \)). In the two groups, SDS and SAS scores after nursing were significantly lower than those before nursing (all \( P < 0.05 \)). See Table 5.

Comparison of quality of life

The SF-36 score in the study group was significantly higher than that in the control group (all \( P < 0.05 \)). See Table 6.

Comparison of hospitalization expenses

There were significantly lower hospitalization expenses in the study group (13,524.14 ± 156.41 Yuan) than in the control group (22,624.14 ± 284.47 Yuan; \( t = 209.7690; P = 0.0000 \)).

Discussion

Patients with chronic renal failure who are usually treated with MHD for a long time have serious conditions and significantly reduced quality of life [13, 14]. Since MHD is a long-term and lifelong treatment method, patients were prone to dialysis disequilibrium syndrome, aneurysm, hemorrhage, and skin infection during the treatment, failing to receive satisfying therapeutic effects. This aggravates patients' depression and anxiety, affects their compliance behavior and restricts their rehabilitation, in addition to the increased treatment costs and aggravated psychological burden and economic pressure [15, 16].

Compared with the control group, patients in the study group had significantly higher nursing...
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With the cooperation of patients with MHD, CNP can greatly relieve their depression and anxiety, improve their coordination and prevents complications such as aneurysm, hemorrhage, infection and thrombosis, therefore greatly improving their quality of life. However, there are deficiencies in this study. For example, the short research time and small sample size fell short of the universality and generality of the results. Therefore, the sample size should be enlarged and the research time should be extended to provide more rigorous and scientific references for clinically evaluating the effectiveness and safety of CNP in the nursing of MHD. It is believed that with the rapid development of medical technology in China, this medical service model will be improved and CNP will be better developed.

Disclosure of conflict of interest

None.

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References


### Table 6. Comparison of quality of life by SF-36 score (X ± sd)

<table>
<thead>
<tr>
<th>Study group (n = 56)</th>
<th>Control group (n = 56)</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health</td>
<td>69.62 ± 5.14</td>
<td>42.05 ± 2.05</td>
<td>35.2293</td>
</tr>
<tr>
<td>Social function</td>
<td>70.26 ± 5.62</td>
<td>42.28 ± 2.17</td>
<td>32.8412</td>
</tr>
<tr>
<td>Perceptions</td>
<td>68.66 ± 5.08</td>
<td>40.06 ± 1.25</td>
<td>38.6565</td>
</tr>
<tr>
<td>Emotion</td>
<td>67.25 ± 6.14</td>
<td>41.66 ± 2.05</td>
<td>27.9536</td>
</tr>
<tr>
<td>Role</td>
<td>69.54 ± 7.64</td>
<td>43.25 ± 2.11</td>
<td>23.4542</td>
</tr>
<tr>
<td>Physical function</td>
<td>70.26 ± 8.15</td>
<td>42.84 ± 2.69</td>
<td>22.5913</td>
</tr>
</tbody>
</table>

Note: SF-36, 36-item short form survey.
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