

# Application of Clinical Nursing Pathway Combined with Cluster Nursing Mode in Biologic Treatment of Rheumatoid Immune Disease Patients

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## Abstract

**Objective:** To investigate the effect of clinical nursing pathway (CNP) combined with cluster nursing mode in intravenous biologic treatment of rheumatoid immune disease patients. **Methods:** Convenience sampling method was used to select inpatients receiving biologics treatment in Rheumatology and Immunology Department of a grade A hospital in Jingzhou city from May 2020 to April 2022. 75 patients from May 2020 to April 2021 were selected as the control group, and 75 patients from May 2021 to April 2022 were selected as the observation group. The control group was given routine care. The observation group was treated with CNP combined with cluster nursing mode on the basis of the control group, and the incidences of adverse infusion reactions, total treatment time, patient satisfaction and nurse satisfaction were compared between the two groups. **Results:** There were statistically significant differences between the two groups after intervention ( $P < 0.05$ ). **Conclusion:** Using CNP combined with cluster nursing mode is beneficial to reduce the incidence of adverse infusion reactions in patients, shorten the total treatment time, and improve the satisfaction of patients and nurses.

## Keywords

Biologic Treatment, Clinical Nursing Pathway, Cluster Nursing, Rheumatoid Immune Disease

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## 1. Introduction

Biologics is a new type of recombinant product selectively targeting molecules involved in immune response or inflammatory process or monoclonal antio-

dies or natural inhibitory molecules targeted at the target [1]. The emergence of biologics brings new hope for targeted treatment of rheumatic diseases. Compared with the conventional therapy, the advantages of using biological agents in the treatment of rheumatic diseases are fast onset, less adverse reactions and high safety of drugs [2] [3] [4]. At present, with the deepening of the National Health Reform Policy, a series of policies that benefit the people such as “National drug collection” and “National health insurance talks” [5] [6] have gradually increased the number of patients treated with biological agents. Studies have shown that standardized infusion of biologics can reduce potential adverse effects, maximize patient safety, improve disease activity, and improve patient satisfaction [7].

The Clinical Nursing Pathway (CNP) optimizes the nursing workflow under the premise of being patient-centered. Forming a standardized nursing process makes nursing work more targeted, predictable, and standardized, and at the same time, it can improve patient compliance with disease participation and satisfaction with nursing work [8]. Cluster nursing is a nursing program formed by combining interrelated evidence-based measures, aiming to make patients get the best treatment during hospitalization, with operability and target advantages [9] [10].

To further improve the standardization of intravenous treatment with biological agents, in this study, the clinical nursing pathway combined with cluster nursing model was used to intervene the patients treated with biological agents in the Department of Rheumatology and Immunology of a grade A hospital in Jingzhou from May 2020 to April 2022. The effect was good. The following is the report.

## 2. Objects and Methods

### 2.1. Subjects

Convenience sampling method was used to select patients who received biologic treatment from a Third class A hospital in Jingzhou city from May 2020 to April 2022. Inclusion criteria: 1) Older than 18 years old; 2) patients who can take medicine according to the course of treatment; 3) Informed consent, able to cooperate with the completion of this study; Exclusion criteria: 1) Consciousness disorder; 2) Patients with hepatitis B, tuberculosis, tumor or infection. According to the above criteria, 75 patients from May 2020 to April 2021 were included as the control group, including 42 males and 33 females, aged from 19 to 78 years old, with an average of  $(42.5 \pm 6.2)$  years, and the disease course was from 3 to 180 months. From May 2021 to April 2022, 75 patients were included in the observation group, including 40 males and 35 females, aged from 21 to 75 years, with an average of  $(45.6 \pm 7.4)$  years, and the course of disease was from 4 to 156 months. There was no significant difference in age, gender, course of disease and other general information between the two groups ( $P > 0.05$ ), indicating comparability. In this study, the biologics used by the patients were mainly Infliximab,

Belimumab, Tocilizumab. The study was approved by the hospital ethics Committee and informed consent was signed by the patients.

## 2.2. Methods

1) Control group. The control group was carried out according to the routine treatment and nursing of rheumatology and immunology biological agents, mainly including admission assessment, ward disinfection, medication according to the doctor's advice, strengthening ward tour, disease observation and education, etc.

2) On the basis of the control group, the observation group adopted clinical pathway combined with cluster nursing mode for intervention. Specific contents: a) Set up a joint medical team composed of department director, head nurse, attending physician and specialist nurse, and formulate the work schedule; b) The standardized and systematic clinical nursing path table of biologic treatment was formed from "environmental preparation", "assessment before medication", "drug allocation", "drug infusion" and "disposal after treatment". In terms of "environmental preparation", the patient is admitted to a dedicated ward and the ward is sterilized with ultraviolet light before and after biotherapy. In terms of "pre-drug assessment", a comprehensive pre-infusion assessment item was developed, which mainly included the history of allergy, screening for tuberculosis and hepatitis B, infection, vaccination, pregnancy and breastfeeding, etc. In the aspect of "drug allocation", it emphasizes the matters needing attention in the process of biological preparation allocation, focusing on strict aseptic operation, timely configuration of medicines for use as soon as possible, strict compliance with disinfection and drug dispensing requirements, including slow injection, avoidance of shock and air bubbles, and maintaining certain the total amount of solution. In terms of "drug infusion", nurses use venous indwelling needles to puncture to ensure the reliability of venous access, and use adjustable infusion sets to regulate the infusion rate. The nurse will measure the patient's vital signs 10 minutes before the medication, and administer anti-allergic drugs to the patient as prescribed by the doctor. After 30 minutes of medication, the nurse will measure the vital signs again. During the infusion process, nurses visit the ward every half an hour, focusing on strengthening the understanding and handling of adverse reactions. In terms of "post-treatment treatment", 10 minutes after the end of medication, nurses monitor vital signs again to observe adverse reactions. At the same time, nurses provide comprehensive health education to patients, such as observation after treatment, avoiding various incentives, colds, fatigue, etc., adhere to regular medication, and conduct satisfaction surveys on patients.

## 2.3. Evaluation Indicators

1) Incidence of adverse reactions, including headache, dizziness, increased or decreased blood pressure, chest tightness, rash, and drug extravasation; 2) Treat-

ment completion time: statistics from the time the patient entered the ward to the end of the treatment; 3) Patient satisfaction, Nurse satisfaction: self-designed satisfaction questionnaires were used to survey patients within 6 hours after the end of treatment. The evaluation level of the satisfaction survey is divided into three levels: satisfied, general and dissatisfied.

## 2.4. Statistical Methods

SPSS22.0 statistical software was used for data processing and analysis, measurement data were expressed as mean  $\pm$  standard deviation ( $\bar{X} \pm s$ ), and independent samples *t* test was used for comparison between groups; count data were expressed as frequency and percentage (%), chi-square test was used for comparison between groups;  $P < 0.05$  was considered statistically significant.

## 3. Results

1) Comparison of the incidence of adverse drug reactions and drug extravasation between the two groups. There were 2 cases of adverse reactions in the observation group, including 1 case of dizziness and 1 case of rash. The nurse performed anti-allergic treatment as prescribed by the doctor, and the infusion rate of the patient was slowed down to 10 ML/h (3 drops/h), and the patient's symptoms were gradually relieved. The treatment is completed after the patient's symptoms are relieved. There was 1 case of drug extravasation, which was a patient with poor vascular condition. The nurse found it in time and dealt with it. All patients in the observation group completed the prescribed treatment, and no patient injury occurred. There were 10 adverse reactions in the control group, including 3 cases of dizziness, 2 cases of increased blood pressure, 2 cases of headache, 2 cases of rash, and 1 case of dyspnea. One patient with dyspnea developed chest tightness and dyspnea 15 minutes after the infusion. After stopping the infusion, changing the infusion set, and using anti-allergic drugs, the patient's symptoms gradually eased, and the final treatment was not completed. Drug extravasation occurred in 8 cases, indwelling needles were not used in 6 cases, and vascular conditions were not in 2 cases. After the infusion extravasation occurred, the nurses carried out active and effective treatment. There were statistically significant differences in the incidence of adverse drug reactions and drug extravasation between the two groups ( $P < 0.05$ ) (see **Table 1**).

**Table 1.** Comparison of the incidence of adverse drug reactions and the incidence of drug extravasation between the two groups [n(%)].

| Group             | n  | Adverse reactions | Drug extravasation |
|-------------------|----|-------------------|--------------------|
| Control group     | 75 | 10 (13.33)        | 8 (10.67)          |
| Observation group | 75 | 2 (2.67)          | 1 (1.33)           |
| $\chi^2$          |    | 5.80              | 5.79               |
| <i>P</i>          |    | 0.031             | 0.034              |

2) Comparison of treatment completion time, patient and nurse satisfaction between the two groups. The treatment completion time in the observation group was 3 hours compared with 6 hours in the control group, which significantly saved the patients' treatment time. In terms of patient and nurse satisfaction, the observation group was significantly improved compared with the control group, and the difference was statistically significant ( $P < 0.05$ ) (see **Table 2**).

#### 4. Discussion

According to the fifth national health service survey report, the prevalence of rheumatic diseases in my country is increasing year by year, and its prevalence is currently second only to circulatory system and endocrine and metabolic diseases [11]. If rheumatic diseases cannot be actively and regularly treated, joint pain and its complications will have a serious impact on the quality of life of patients. Biologics therapy is a precise targeted therapy method. For patients with highly active disease, poor prognosis, ineffective treatment with traditional anti-rheumatic drugs, and fertility requirements, individualized treatment of biological agents combined with common antirheumatic drugs is performed. The regimen can significantly reduce disease activity and delay disease progression. However, due to the particularity of its drug properties, it has high requirements on the required configuration and infusion process. Non-standard infusion will cause different degrees of adverse reactions, which may endanger the patient's life in severe cases. Therefore, the standardized infusion of biological preparations is of great significance.

In routine clinical nursing practice, nursing based on experience is usually implemented based on relevant training, and it is often the patient who has nursing problems before taking corresponding measures. There are problems such as lack of predictability, lack of science, and lack of organization. Cluster nursing is based on evidence-based care, to predict the problems that may occur in the treatment, first formulate specific measures, focus on preventive care and have strong operability and purpose [12]. For example, in the drug configuration of infliximab, in order to minimize the waste of patients' drugs due to adverse reactions, two bottles of drugs were prepared separately, and the second bottle was configured when one bottle of drug was infused without adverse reactions.

**Table 2.** Comparison of completion time, patient and nurse satisfaction between the two groups [n(%)].

| Group             | n  | Treatment time (h) | Patient satisfaction |          |              | Nurse satisfaction |         |              |
|-------------------|----|--------------------|----------------------|----------|--------------|--------------------|---------|--------------|
|                   |    |                    | satisfied            | general  | dissatisfied | satisfied          | general | dissatisfied |
| Control group     | 75 | 6                  | 49 (65.33)           | 21 (28)  | 5 (6.67)     | 45 (60)            | 30 (40) | 0            |
| Observation group | 75 | 3                  | 71 (94.67)           | 4 (5.33) | 0            | 69 (92)            | 6 (8)   | 0            |
| <i>t</i>          |    |                    |                      | 4.65     |              |                    | 5.29    |              |
| <i>P</i>          |    |                    |                      | <0.001   |              |                    | <0.001  |              |

While ensuring the concentration of the drug, it can avoid the waste of drugs [7]; in addition, the identification and treatment of adverse reactions is particularly important [13], the department summarizes scientific treatment measures based on evidence, and makes it clear to nurses in the form of flowcharts. This method has strong clinical guidance.

This study adopts the mode of combination of cluster measures and clinical nursing path, so that responsible nurses can complete nursing measures in a timely, effective and standardized manner at each stage of biological agent treatment, ensure the safety of treatment, and minimize the occurrence of adverse reactions of patients. In addition, the advantage of the clinical nursing path is that it can improve the work efficiency of nurses, and the work of nurses before, during and after treatment is more organized, which improves the satisfaction of nurses; at the same time, it can shorten the time of the whole process of patient treatment and save time for patients cost [14]. This model enables sufficient and effective communication between nurses and patients, enables patients to participate in the whole process of treatment, strengthens the significance of adhering to regular treatment and follow-up, is conducive to self-management of patients with chronic diseases, and improves patients' compliance with regular treatment. In this way, patients can avoid exacerbation or recurrence of disease by interrupting treatment for various reasons.

## 5. Conclusion

To sum up, the clinical nursing pathway combined with the cluster nursing mode for patients receiving biological treatment of rheumatic immune diseases can effectively reduce the incidence of adverse reactions in patients with infusion, ensure the safety of medication to the greatest extent, and shorten the overall treatment time. It can significantly improve patients' satisfaction with nursing work; it can make nurses' work more organized, improve nurses' work efficiency, and improve nurses' satisfaction, which is worthy of clinical application. However, the shortcomings of this study are that it is only conducted in a single medical institution, lacks a multi-center sample size, and lacks evaluation indicators related to the patient's disease activity in the patient outcome indicators, which needs further research.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] Jin, H.G. and Gao, L.X. (2016) Advances in the Treatment of Rheumatic Immune Diseases with Biological Agents. *Clinical Metabolism*, **31**, 490-495.
- [2] Gao, L.X., Ma, L.Y., *et al.* (2019) Main Clinical Progress of Rheumatology in 2018. *Clinical Metadata*, **34**, 23-32.

- [3] Lu, Y.J. (2020) The Application Value of Biological Agents in Rheumatism Immunotherapy. *Contemporary Medicine*, **26**, 75-77.
- [4] Pan, T., Zhu, A.L., Guo, F., *et al.* (2018) To Study the Clinical Efficacy of Yisaipu in Patients with Rheumatic Immune Diseases. *China Practical Medicine*, **13**, 103-105.
- [5] The National Medical Security Administration (2019) The National Medical Security Administration and Other Nine Departments on the Implementation of the National Organization of the Pilot Program of Centralized Procurement and Use of Drugs to Expand the Scope of the Implementation. [http://www.nhsa.gov.cn/art/2019/9/30/art\\_37\\_1817.html](http://www.nhsa.gov.cn/art/2019/9/30/art_37_1817.html)
- [6] National Medical Insurance Administration (2019) Notice of the Ministry of Human Resources and Social Security of the National Medical Insurance Administration on Including the Negotiated Drugs in 2019 into the Category B Scope of the “National Basic Medical Insurance, Work Injury Insurance and Maternity Insurance Drug Catalog”. [http://www.nhsa.gov.cn/art/2019/11/28/art\\_37\\_2050.html](http://www.nhsa.gov.cn/art/2019/11/28/art_37_2050.html)
- [7] National Nursing Collaborative Group for Chronic Disease Management of Rheumatic Immune Diseases (2016) Expert Consensus on Infliximab Infusion Nursing Care (2014 Edition). *Chinese Journal of Rheumatology*, **20**, 193-196.
- [8] Zhang, X.Y., Shi, X.N., *et al.* (2018) Application of Clinical Nursing Pathway in Nursing of Patients with Placenta Accreta. *PLA Nursing Journal*, **35**, 51-54.
- [9] Zhang, Z.L., Su, Z.L., Li, P., *et al.* (2018) Application of Cluster Nursing in Patients Undergoing Coronary Intervention. *Journal of Nursing*, **7**, 221-225. <https://doi.org/10.12677/NS.2018.75041>
- [10] Wu, Z.Q. (2016) Application of Cluster Management in the Treatment and Nursing of Rheumatoid Arthritis Patients with Yamerol. *China Modern Doctor*, **54**, 131-134.
- [11] Jiang, L.J., Yu, Q.Q., Yin, W.Q., *et al.* (2018) Analysis of the Trend of Chronic Diseases among Chinese Residents—Based on the Five National Health Service Survey Reports. *China Health Service Management*, **35**, 874-876+880.
- [12] Jason, R., Guertin, J.M., *et al.* (2017) Preliminary Results of the Adoption and Application of the Integrated Comprehensive Care Bundle Care Program When Treating Patients with Chronic Obstructive Pulmonary Disease. *Canadian Respiratory Journal*, **2017**, Article ID: 7049483. <https://doi.org/10.1155/2017/7049483>
- [13] Liu, X.M. and Wang, J.B. (2015) Prevention and Nursing of Adverse Reactions Caused by Tocilizumab Biotherapy in Patients with Rheumatoid Arthritis. *Journal of Nursing*, **4**, 31-33.
- [14] Cui, X.Q. (2021) Clinical Nursing Pathway Combined with Cluster Nursing Mode on Patients with Endoscopic Colon Polypectomy. *Nursing Research*, **35**, 356-358.