Effect of Individualized Nursing Intervention on Patients with Tuberculosis Latent Infection and Active Tuberculosis

Junling Wang*

Wuhai Infectious Disease Hospital, Wuhai 016000, Inner Mongolia Autonomous Region, China

Corresponding author: Junling Wang, wjlxb0302@163.com

Abstract: *Objective:* This paper aims to explore the effect of individualized nursing intervention on patients with active tuberculosis (ATB) and latent tuberculosis infection (LTBI). *Methods:* The nursing study started in January 2020 and ended in January 2023. A total of 60 patients with ATB and LTBI were included, and they were divided into two groups according to the intervention schemes selected for control testing, each with 30 cases. The intervention program selected for group A was routine care, and for group B was individualized nursing. The proportion of adverse reactions, changes in the level of lung items, self-management outcomes and satisfaction were evaluated and compared. *Results:* After evaluating the proportion of adverse reactions, the total proportion of ATB and LTBI in group B was lower than that in group A ($P < 0.05$). Based on the evaluation and testing of the expiratory flow (EF), expiratory volume (EV), and vital capacity (VC) after the intervention, these levels in group B showed higher outcomes than those in group A ($P < 0.05$). The scores in terms of living habits, sleep, diet, and compliance in group B were higher than those in group A ($P < 0.05$). The total proportion of the satisfaction of ATB and LTBI patients in group B was higher than that in group A ($P < 0.05$). *Conclusion:* After the intervention of individualized nursing measures in patients with ATB and LTBI, it was found that it can not only play a positive role in the prevention and control of adverse reactions, but also improve their lung function, and promote their self-management, with good satisfaction level, thus it has high research and clinical application values.

Keywords: Active tuberculosis; Latent tuberculosis infection; Individualized nursing intervention

1. Introduction

Among infectious diseases, tuberculosis (TB) infection is the most common type of chronic disease. The disease is mostly caused by *Mycobacterium tuberculosis* and it can affect various organs of the human body [1,2]. When the human body is infected by *Mycobacterium tuberculosis*, most of the symptoms may not appear, but if the body's allergic reaction increases or the resistance decreases, it may cause the manifestation of the disease [3,4]. For active tuberculosis (ATB) and latent tuberculosis infection (LTBI), a long course of treatment is involved after the onset of the disease. Long-term treatment will lead to unreasonable drug use in patients and further

reduce their compliance, resulting in worsening or reoccurrence of the condition [5,6]. Therefore, it is necessary to provide appropriate scientific nursing intervention during the treatment period to improve the therapeutic effect and disease prognosis. This article explores the impact of individualized nursing interventions on ATB and LTBI patients.

2. Materials and methods

2.1. General information

The nursing study started in January 2020 and ended in January 2023. A total of 60 patients with ATB and LTBI were included, and they were divided into two groups according to the intervention schemes selected for control testing, each with 30 cases. Inclusion criteria included patients who meet the diagnosis requirements of ATB and LTBI, patients who give informed consent to this trial, and patients who voluntarily participate in the study. Exclusion criteria were patients with coagulation disorders, patients with incomplete data, patients with malignant tumors, patients with mental disorders, and patients with lesions in the nervous and immune-related systems. As shown in **Table 1**, the information aspects of the two groups were all $P > 0.05$ after the test. Ethics approval for this study was obtained.

Table 1. General information

Group	No	Male / Female	Age (mean ± standard deviation, years)
Group B	30	18/12	35.44 ± 2.57
Group A	30	19/11	35.71 ± 2.22
t-value	-	0.451	0.347
P value	-	0.352	0.455

2.2. Methods

The intervention program selected for group A was routine care. The implementation content is as follows. The basic knowledge of the two diseases was first explained to the family members and patients, and at the same time the hazards of the disease were introduced, including the preventive measures that can be taken and the diagnosis and treatment methods to be adopted, and the cooperation and support of patients were obtained to the greatest extent. Secondly, the changes in the patient's physical signs were monitored and recorded, guidance on rehabilitation and medication was provided, windows in the patient's ward were regularly opened for ventilation, disease knowledge was popularized, and corresponding guidance on daily warm-keeping and diet was also provided.

The selected intervention program for group B was individualized nursing, and the implementation content is as follows.

(1) Health education: firstly, sufficient communication was carried out with the patients, about their education level, habits and hobbies, occupational characteristics, personality characteristics, and so on. Personal situations such as region, gender, and age were understood and analyzed. Secondly, targeted publicity and education work were carried out after learning about the individuals. The content of education involves four aspects, namely, behavioral habits, nursing, treatment, and etiology. The knowledge of disease prevention and treatment was explained to each patient, including the precautions, adverse reactions, and expected curative effects, etc. Lastly, when implementing education work, appropriate adjustments were made to the methods and contents of education, the

patient's expression and reflection were focused on, and on the premise of the patient's acceptance and understanding, the questions raised by the patient were patiently answered in a timely manner, and patients were encouraged to actively express their thoughts, their misunderstandings were corrected in time to improve their self-management behaviors and promote their healthy behaviors.

(2) Psychological intervention: during the long-term treatment of the patient's condition, due to the various side effects caused by the drug itself, or the long-term positive burden, the patient will have a series of psychological problems, such as worry and anxiety, depression, etc. Therefore, patients' psychological changes and specific conditions were evaluated and analyzed by the nurses, and personalized counseling and support for their psychological aspects were implemented, so as to eliminate their various psychological problems and improve their cooperation. Each patient was introduced with successful cases, and informed of the importance of maintaining a good attitude for disease treatment, so as to cooperate with therapeutic heart and rehabilitation training.

(3) Diet intervention: in the process of providing daily diet, the patient's personal preferences were fully considered, and scientific recipes were formulated based on individual characteristics and conditions. Nutritious diets were provided, with foods that are rich in vitamins and high-quality protein, in addition patients were guided to drink water appropriately, and fresh fruits and vegetables were provided to improve their physical fitness and nutritional status, thereby enhancing resistance [7,8].

2.3. Evaluation indicators

The evaluation compares the following items:

(1) Proportion of adverse reactions: liver function damage reactions, abdominal pain reactions, vomiting and nausea reactions, dyspnea reactions, loss of appetite reactions, etc., were recorded.

(2) Changes in the level of lung items: three items were measured before and after the intervention, namely, expiratory flow rate (EF), expiratory volume (EV), vital capacity (VC), etc.

(3) Self-management outcome: the scores were evaluated in terms of living habits, sleep, diet, and compliance. The instrument was a self-made scale, with 100 points per item. The higher the score, the better the outcome.

(4) Satisfaction status: the evaluation options involve "very," "not yet," "generally," etc., and the self-made questionnaire was implemented, and the proportion of each item was counted.

2.4. Statistical methods

The test tool is based on SPSS22.0. After the test, the two results are expressed in the form of [n (%)] and mean ± standard deviation (SD) respectively. The changes in the level of lung items and the outcome of self-management are tested by the t method. The x^2 method was used to test the proportion of adverse reactions, satisfaction status, and other counting categories, and $P < 0.05$ was used to express the statistical significance of the comparison results of the test values.

3. Results

3.1. Comparison of adverse reactions

Based on **Table 2**, the total proportion of adverse reactions of ATB and LTBI patients in group B was lower than that in group A ($P < 0.05$).

Table 2. Comparison of adverse reactions [n (%)]

Group	Impaired liver function	Stomach ache	Vomiting and nausea	Breathing difficulty	Loss of appetite	Incidence rate (%)
Group B (n = 30)	0	0	1	1	1	3 (10.00)
Group A (n = 30)	1	1	2	2	2	8 (26.67)
x^2 value	-	-	-	-	-	5.344
P value	-	-	-	-	-	0.015

3.2. Comparison of lung items

As shown in **Table 3**, the levels of EF, EV, VC, etc., in group B after intervention showed higher outcomes than those in group A ($P < 0.05$). However, before intervention, each level in the two groups were close ($P > 0.05$).

Table 3. Comparison of lung items (mean ± SD, n = 30)

Group	EF (L/min)		EV (L)		VC (L)	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Group B	144.25 ± 16.55	176.21 ± 22.47	1.84 ± 0.35	2.77 ± 1.15	2.94 ± 0.75	4.22 ± 0.15
Group A	144.31 ± 16.74	160.23 ± 20.34	1.81 ± 0.52	2.34 ± 0.42	2.81 ± 0.61	3.72 ± 0.25
t-value	0.145	16.124	0.347	4.365	0.134	5.844
P value	0.685	0.000	0.445	0.025	0.574	0.011

3.3. Comparison of self-management

According to **Table 4**, the scores in terms of living habits, sleep, diet, and compliance in group B were higher than those in group A ($P < 0.05$).

Table 4. Comparison of self-management (mean ± SD, points)

Group	Living habit	Sleep	Diet	Compliance
Group B (n = 30)	97.54 ± 1.35	97.45 ± 2.12	98.22 ± 0.85	98.45 ± 1.15
Group A (n = 30)	82.42 ± 1.62	85.24 ± 2.31	84.21 ± 1.34	84.22 ± 1.54
t-value	15.124	12.365	14.574	14.214
P value	0.000	0.000	0.000	0.000

3.4. Comparison of satisfaction status

As presented in **Table 5**, the total proportion of satisfaction status of ATB and LTBI patients in group B was higher than that in group A ($P < 0.05$).

Table 5. Comparison of satisfaction status [n (%)]

Group	Not yet	Very	General	Overall (%)
Group B (n = 30)	1	21	8	29 (96.67)
Group A (n = 30)	6	15	9	24 (80.00)
x^2 value	-	-	-	5.322
P value	-	-	-	0.014

4. Discussion

In the clinical treatment of ATB and LTBI patients, the more commonly used method is drug therapy. However, due to the lack of sufficient understanding of the hazards of the disease, some patients may not take the medicine in time or on a regular basis, which will affect the overall curative effect of the drug [9,10]. At the same time, long-term treatment will reduce the patient's self-management level, and may also cause some unauthorized drug withdrawal, so the overall curative effect will be seriously affected. By cooperating with the corresponding nursing during the treatment of patients, their awareness of self-management can be greatly enhanced, thereby ensuring the effect of treatment [11,12]. As a new type of intervention, individualized nursing has been widely used in recent years, and the results achieved are remarkable [13]. By applying this method to the staff of ATB and LTBI patients, the premise of carrying out various tasks is mainly the individual situation of the patient, which can help patients to fully understand and grasp the hazards of the disease, the cause of the disease, the expected effect after treatment, and the cooperation items during treatment. The individualized nursing method encourages patients to actively express their feelings and ideas, and nurses provide targeted explanations and education, so as to effectively avoid various factors that affect the patient's condition and curative effect, and further guarantee its overall effect and prognosis [14,15]. In this paper, the total proportion of adverse reactions of ATB and LTBI patients in group B was lower than that in group A ($P < 0.05$). Compared with group A, the levels of various lung items in group B after intervention for ATB and LTBI patients showed higher outcomes ($P < 0.05$). The self-management scores of ATB and LTBI patients in group B were higher than those in group A ($P < 0.05$). Compared with group A, the overall satisfaction ratio of ATB and LTBI patients in group B was higher ($P < 0.05$). It can be seen that the intervention of individualized nursing measures for patients with ATB and LTBI generally presents a better outcome.

5. Conclusion

To sum up, individualized nursing measures for patients with ATB and LTBI can not only actively prevent and control adverse reactions, but also improve their lung function, and promote better self-management, with good satisfaction, thus it has high research and clinical application values.

Disclosure statement

The author declares no conflict of interest.

References

[1] Deng J, 2021, The Effect of Individualized Nursing Intervention on Tuberculosis Latent Infection and Active Tuberculosis Patients. Shanxi Medical Journal, 50(13): 2130–2132.

[2] Ma Y, Lu W, Cheng S, 2023, Current Status of Latent Infection of *Mycobacterium tuberculosis* and Countermeasures for Prevention and Control. PLA Medical Journal, 48(6): 634–642.

[3] Shen X, Xiao W, Pan Q, *et al.*, 2023, Strengthen the Management of Latent Infection and Accelerate the Decline of Tuberculosis Epidemic. Shanghai Preventive Medicine, 35(3): 199–202.

[4] Zhao X, Cheng Y, Zhang M, *et al.*, 2022, Management of Latent Tuberculosis Infection and Active Tuberculosis in Patients with Advanced Lung Cancer Receiving Immune Checkpoint Inhibitor Therapy. Chinese Journal of Medicine, 102(6): 454–462.

[5] Ma Y, Lu W, Gao L, *et al.*, 2022, To End the Tuberculosis Epidemic, We Must Strengthen the Management of

Screening and Preventive Treatment of High-Risk Groups with Latent Infection of *Mycobacterium tuberculosis*. Chinese Journal of Antituberculosis, 44(3): 209–214.

[6] Wang H, Luo L, Rao G, *et al.*, 2021, Research Progress in the Pathogenesis of Tuberculosis and its Significance to the Current Prevention and Control of Tuberculosis. Infectious Disease Information, 34(4): 361–364.

[7] Liang Y, 2020, Effect of Individualized Nursing Intervention on Improving Lung Function and Quality of Life in Patients with Tuberculosis Latent Infection and Active Tuberculosis. China Health and Nutrition, 30(7): 213–214.

[8] Wei X, 2019, Analysis of the Influence Value of Individualized Nursing Intervention on Tuberculosis Latent Infection and Active Tuberculosis Patients. Chinese Medicine Guide, 17(4): 229–230.

[9] Qiu F, 2020, The Effect of Individualized Nursing Intervention on Tuberculosis Latent Infection and Active Tuberculosis Patients. Chinese Medicine Guide, 18(5): 236–237.

[10] Zhou Y, 2022, The Effect of Individualized Nursing Intervention on Tuberculosis Latent Infection and Active Tuberculosis Patients. Chinese Medicine Guide, 20(33): 17–20.

[11] Zhao Y, 2021, The Effect of Individualized Nursing on Improving Pulmonary Function in Patients with Tuberculosis Latent Infection and Active Tuberculosis. Chinese Medicine Guide, 19(32): 143–144.

[12] Chen S, Long H, Lin W, *et al.*, 2023, Investigation and Risk Factor Analysis of Latent Tuberculosis Screening Results for Secondary School Students in Xinhui District, Jiangmen City. Journal of Guangzhou Medical University, 51(1): 45–49.

[13] Li G, Pang X, Xu H, *et al.*, 2021, Advances in Diagnosis and Treatment of Latent Tuberculosis Infection. Chinese Journal of Antituberculosis, 43(1): 91–95.

[14] Shen Y, Luo D, Ma H, *et al.*, 2019, Clinical Significance and Follow-Up Observation of T-SPOT.TB Detection of Latent Tuberculosis Infection (LTBI) in Patients with Behcet's Disease (BD). Fudan Journal (Medical Edition), 46(1): 42–46.

[15] Yang Q, Ruan Q, Zhang W, 2019, Screening and Preventive Treatment of Latent Tuberculosis Infection in HIV-Infected Population. Journal of Clinical Internal Medicine, 36(11): 729–732.