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Original Article

Study on the effect of one-stop service combined with clinical nursing path on patients with acute bronchial asthma

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Abstract: Objective: This study aimed to establish a one-stop service platform, explore and evaluate the implementation effect of one-stop service combined with clinical nursing path on patients with acute bronchial asthma. Methods: Altogether 86 patients with acute bronchial asthma in our hospital were collected by convenient sampling method, and were randomly divided into the observation group and the control group, with 43 cases in each group. The observation group was given one-stop service combined with clinical nursing path. The control group was only provided with routine nursing intervention. The nursing effect was evaluated by comparing the incidence of examination and preparation defects, the improvement time of clinical symptoms and signs, the score of quality of life, the incidence of interruption of nurses' work due to inquiring about examination-related matters, nursing cooperation and satisfaction between the two groups. Results: The incidence of examination and preparation defects in the observation group was significantly lower than that in the control group ($P<0.001$). The durations of wheezing, coughing, expectoration and lung rales in the observation group were shorter than those in the control group ($P<0.05$). The quality of life score in the observation group was higher than that in the control group ($P<0.05$). The incidence of interruption of nurses' work in the observation group was significantly lower than that in the control group ($P<0.01$). The nursing cooperation and satisfaction of the observation group were higher than those of the control group (all $P<0.05$). Conclusion: One-stop service combined with clinical nursing path intervention has a positive effect on the treatment of patients with acute bronchial asthma.

Keywords: One-stop service, clinical nursing path, bronchial asthma, quality of life, satisfaction

Introduction

Bronchial asthma is a common chronic airway inflammatory disease, and it is characterized by paroxysmal or persistent respiratory symptoms and airway airflow obstruction [1]. In addition, it has a correlation with the change of respiratory flow, thickening of airway wall and other factors. Patients with acute asthma often need hospitalization, and severe cases can even threaten their lives [2]. Researches have shown that one out of every 250 deaths is caused by asthma [3]. Asthma has seriously affected human health, and brought a heavy economic burden to individuals, families and society. Acute asthma attacks need to be treated in time, and the nursing work is also very important for the treatment effect and recovery of patients [4]. At present, routine nursing can provide the necessary needs for patients, but it has some shortcomings, such as weak pertinence, long waiting period for patients, and lack of efficient and comprehensive service quality [5]. However, one-stop service can combine the characteristics of patients' diseases and the existing electronic information to contribute to decision makers, service providers and patients being serviced [6]. Clinical nursing path can make a more scientific nursing mode for people with acute asthma attack [7]. If the one-stop service and clinical nursing path can be combined effectively, they may provide more comprehensive and efficient nursing services for patients. There were many clinical nursing

paths in adolescent asthma research, but few in adult asthma research. Therefore, this study adopted one-stop service combined with clinical nursing paths to provide inpatient care for adult asthma patients, and explored its implementation effect.

Materials and methods

Data collection

From September 2018 to August 2020, 86 patients with acute bronchial asthma in Harbin Traditional Chinese Medicine Hospital were collected by convenient sampling method. The patients met the criteria of asthma diagnosis and treatment guidelines. Inclusion criteria: patients were definitely diagnosed as acute attack of bronchial asthma, and aged over 18 years [3, 8, 9]; patients and their families signed informed consent; patients had clear consciousness and good communication, and patients had been hospitalized for more than 4 days. Exclusion criteria: patients had respiratory diseases caused by cardiac asthma, pleural effusion and other factors, language communication disorders and mental diseases, and complicated with severe organ dysfunction such as heart, liver and kidney. This research has been approved by Ethics Committee of Harbin Traditional Chinese Medicine Hospital.

Grouping and implementation strategy

Altogether 86 patients were divided into the control group and the observation group according to random figure table method. Patients in the control group were given routine nursing care: First, the nursing staff ensured that the room temperature and humidity were appropriate, with regular window ventilation, kept the room clean, and did not put flowers, plush products and other indoor irritant allergens that are easy to cause acute attack of bronchial asthma in patients. Second, the patient's physical signs were regularly observed and recorded, and patients were required to stay in bed and not exercise excessively. At last, patients were given oxygen, instructed to take medicine regularly in strict accordance with the medical advice, and helped to expectorate sputum to keep the respiratory tract unobstructed.

On the basis of the control group, the observation group was given one-stop service combined with clinical nursing path. The specific intervention process was as follows: First, a one-stop service and clinical nursing path implementation team was established, and six fixed medical workers in the department were selected to form a research group, including one associate chief physician, one associate chief nurse and four nurses. Second, the team was trained to be familiar with the implementation contents of one-stop service and clinical nursing path, and the standard one-stop service process and clinical nursing path were worked out together. The specific contents of the one-stop service process were as follows: (1) A one-stop service file was established, and the team members recorded the bed number, name, disease diagnosis, medication, address and contact information of the patients in the observation group; (2) During the hospitalization, patients' examination, treatment items and payment were all guided by the team members, and the accompanying family members were informed of the time and place of the examination; (3) A special green channel window for the examination and charging of patients with acute asthma attack was established, so as to avoid the untimely payment and inspection of patients; (4) After the patient was discharged from hospital, the team members would conduct regular follow-up to understand the disease situation, guide the patient to check regularly, and answer questions about family home care and patient's condition. The implementation of clinical nursing path included the following aspects: (1) After the patient was admitted to hospital, the research team would organize the patient's family members to jointly formulate a scientific clinical nursing path according to the patient's physical and mental conditions as soon as possible; (2) On the first day of admission, the team members explained the clinical symptoms of acute attack of bronchial asthma to the patients and their accompanying family members according to the basic examination results and the severity of the disease, deepened their understanding of the disease, and gave the patient version form of clinical nursing path to the patients, so that the patients and their families could understand the significance of clinical nursing path. At the same time, psychological counseling was performed to patients to relieve their nervousness; (3) On the second day after admission, the patients were continued to inhale oxygen, the treatment effect and whether the symp-

toms were alleviated were observed, and the patients and their families were informed of the inspection items, time, place and precautions that need to be completed. The patients were reminded of the semi-sitting or lateral position to reduce the heart load and avoid asthma aggravation, and the families were told to prepare light nutritious and digestible food for the patients; (4) On the third day of admission, the patients received intermittent oxygen inhalation, continued clinical monitoring, and further health education in combination with their disease status. They were informed of the clinical prognosis of bronchial asthma and explained with the standardization and importance of medication to strictly control the acute attack of the disease; (5) From the 4th day of hospitalization to discharge from hospital, the treatment effect of patients was evaluated, continue intermittent low-flow oxygen inhalation was applied at the same time, patients were guided to use atomized inhalant correctly, reminded to follow doctor's advice and scientifically regulate medication, informed of side effects of drugs, and corrected with the wrong medication concept; (6) On the day of discharge, patients and their families were reminded to pay attention to allergens that may come into contact with them again, instructed to exercise properly and enhance the lung function, and informed of self-monitoring, eating, nursing and precautions at home.

Outcome measures

Main outcome measures: (1) The incidence of examination and preparation defects (including examination time and place, preparation before examination, such as fasting, drinking water and holding urine, carrying examination sheets, accompanying by family members) between the two groups was compared. If the patient has one or more examination and preparation defects during hospitalization, it will be recorded as one case of examination and preparation defect. Defect incidence = total number of defects/total number of patients in each group; (2) The improvement time of patients' clinical symptoms and signs, that is, the duration of wheezing, cough, expectoration and lung rales (from the time the patient was admitted to hospital to the end of discharge) was observed; (3) The change of the patient's quality of life score during hospitalization was observed (the family members cooperated with the patient to fill in the quality of life evaluation form at admission and at discharge, and the difference between the two evaluation represents the improvement degree of the patient's quality of life score) [10]. Secondary outcome measures: the incidence of interruption of nurses' work due to inquiring about examination-related matters (the incidence of interruption = interruption of nurses' work/total number of patients in each group), nursing cooperation (nursing cooperation = nursing cooperation number/total number of patients in each group) and satisfaction (satisfaction = satisfaction number/total number of patients in each group) were observed.

Statistical analysis

SPSS 23.0 was applied to analyze the collected data. Measurement data were represented by mean ± standard deviation ($\bar{x}$ ± sd), and compared using independent sample t test. Counting data were represented in percentage (%), and compared by Chi-square test. When $P< 0.05$, the difference was statistically significant.

Results

Comparison of general data

The general data of patients in the two groups showed that patients in the control group aged 25-59 years, with an average age of 46.3±9.1 years and an average course of disease of 5.4±1.0 years. Patients in the observation group aged 24-61 years, with an average age of 46.7±9.6 years and an average course of disease of 5.5±1.2 years. There were 20 male patients and 23 female patients in the control group, and 19 male patients and 24 female patients in the observation group. After analysis, the *P* values of the basic data (age, gender, and course of disease) of patients in the two groups are all greater than 0.05, with no statistical significance, as shown in **Table 1**.

Comparison of the incidence of examination and preparation defects

The results showed that the incidence of examination and preparation defects in the observation group was significantly lower than that in the control group ($P<0.001$), as shown in **Table 2**.

Table 1. Comparison of general data between the two groups

Group	Control group	Observation group	P
Total people	43	43	
Gender (male/female)	20/23	19/24	0.829
Average age (years)	46.3±9.1	46.7±9.6	0.756
Average height (cm)	168.77±7.78	169.19±8.60	0.861
Average BMI (kg/m^2)	20.92±1.82	20.77±1.99	0.921
Average course of disease (years)	5.4±1.0	5.5±1.2	0.392

Note: BMI: body mass index.

Table 2. Comparison of the incidence of examination preparation defects between the two groups

Group	Total people	Defects	No defect occurred	Defect rate (%)
Control group	43	17	26	39.53
Observation group	43	2	41	4.65
χ^2				13.241
P				0.000

Table 3. Comparison of the duration of related symptoms between the two groups ($\bar{x}$ ± sd, d)

Group	Control group	Observation group	t	P
Total people	43	43		
Breathing	4.51±1.64	3.72±1.67	2.219	0.029
Cough	4.26±1.32	3.55±1.34	2.418	0.015
Expectoration	3.90±1.24	3.05±1.26	3.156	0.002
Pulmonary rales	4.93±1.64	3.66±1.32	3.948	0.000

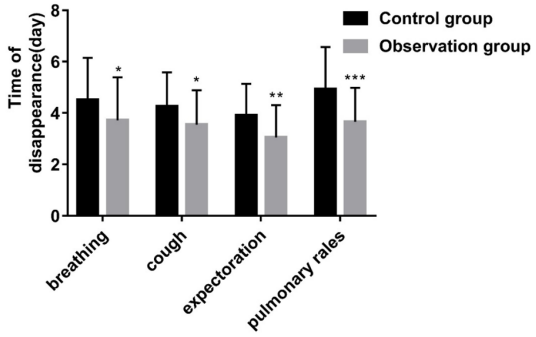

Figure 1. Comparison of the duration of related symptoms between the two groups. Compared with the control group, *P<0.05, **P<0.01, ***P<0.001.

Comparison of the duration of symptoms and signs

The durations of wheezing, coughing, expectoration and lung rales in the observation group were lower than those in the control group (P<0.05), as shown in **Table 3** and **Figure 1**.

Comparison of the increase of quality of life score

The quality of life of patients in both groups improved after admission, and the improvement degree in the observation group was significantly higher than that in the control group (P<0.001), as shown in **Table 4**.

Comparison of the incidence of interruption of nurses' work due to inquiry about examination-related matters

The interruption of nurses' work due to inquiring about examination-related matters in the observation group was significantly reduced (P<0.01), as shown in **Table 5**.

Comparison of nursing cooperation and nursing satisfaction

The results showed that patients' satisfaction and nursing cooperation in the observation group were higher than those in the control group (P<0.05), as shown in **Table 6**.

Discussion

As one-stop service can optimize the patient's medical treatment process, enable patients to obtain medical services more quickly and efficiently, and save unnecessary time and cost, it has won unanimous praise in the application of various clinical departments in hospitals. In addition, it can also enable doctors to know the condition of the disease quickly and accurately, avoid unnecessary waste of medical resources, slow down the increasing contradiction between doctors and patients, and finally achieve the purpose of improving the patient's satisfaction and better treating the disease [11, 12]. Many studies have applied one-stop service in clinical treatment, and achieved certain results. For example, Wan et al. adopted one-stop service

Table 4. Comparison of the increase in the quality of life score between the two groups of patients after admission ($\bar{x} \pm sd$)

Group	Total people	Increased quality of life score
Control group	43	6.30±1.78
Observation group	43	8.84±1.86
T		-6.450
P		0.000

Table 5. Comparison of the incidence of interruption of nurses' work between the two groups of patients due to inquiries about examination-related matters

Group	Total people	Interrupt the nurse's work	Uninterrupted the nurse's work	Interruption rate (%)
Control group	43	18	25	41.86
Observation group	43	4	39	9.30
χ^2				11.972
P				0.001

Table 6. Comparison of results of nursing satisfaction and nursing cooperation between the two groups

Group	Control group	Observation group	χ^2	P
Total people	43	43		
Number of satisfied	32	40		
Satisfaction (%)	74.42	93.02	5.460	0.019
Number of people	31	39		
Degree of cooperation (%)	72.09	90.70	4.914	0.027

outpatient model to manage female with perineal and pelvic diseases, and the results showed that one-stop service enabled clinicians to better provide postoperative outcome consultation for women with obstetric anal sphincter injuries (OASI) and reduce the risk of disease complications [13]. Xia et al. found that one-stop service had a positive impact on optimizing the treatment process of oral diseases, improving the treatment experience of elderly patients, and then improving the oral health of the elderly [14]. In addition, one-stop service was effective in screening and treating venereal disease [15, 16]. In a word, one-stop service is of great significance in outpatient service or in-patient department process optimization, and plays a favorable role in different clinical departments. Therefore, it has been continuously promoted and applied in medical treatment in recent years, and it has been widely used in various fields [17-19].

Clinical nursing path is an effective and convenient tool to evaluate the quality of hospital management and diagnosis and treatment services according to standardized charts prepared in advance. It can formulate a more efficient and scientific nursing model for specific patients or diseases. Researchers such as Watanabe have reduced the side effects and drug costs of patients with chronic heart failure, and helped patients with cardiovascular diseases to better manage their own lives [20]. Previous reviews clearly stated the positive role of clinical nursing pathway, which can reduce the average hospital stay of patients and improve the quality of service [21].

Many studies have confirmed that clinical nursing pathway has a positive impact on patients with acute bronchial asthma, while one-stop service is rarely used in asthma [22]. Therefore, based on the advantages of one-stop service and the benefits of clinical nursing path to patients, this study combined two ways to treat acute bronchial asthma patients. The results showed that one-stop service combined with clinical nursing path could improve the nursing satisfaction and cooperation of patients with acute asthma attack, which was similar to the research results of other scholars [23, 24]. The average duration of cough and moist rales in the observation group was less than that in the control group, which was consistent with the research results of Pan et al. [24]. At the same time, this study found that one-stop service combined with clinical nursing path can effectively reduce the incidence of patients' examination preparation defects and the incidence of patients' interruption of nurses' work due to inquiring about examination-related matters. The previous research on asthma nursing methods did not mention these two indicators, but Luo et al. found that "one-stop" auxiliary nursing can reduce the incidence of patients' examination preparation defects and patients' interruption of nurses' work in the exploration of the effect of one-stop accurate education

platform on hospitalized patients [25]. This study introduced the above two observation indicators for the first time in patients with acute asthma attack to further illustrate the importance of one-stop service. At the same time, the research results showed that the combined nursing method can improve the score of patients' quality of life, which was consistent with the research results of Chen and Wu [26, 27].

The application of one-stop service combined with clinical nursing pathway in China is still under exploration, and only a few studies have carried out this method [28, 29]. Our research provided a data base for the combined application of the two, and gave a new idea for clinical nursing of other diseases. This study preliminarily explored the application of one-stop service combined with clinical nursing pathway in adult asthma. The observation indicators were relatively comprehensive, but the changes of lung function of patients before and after nursing were not observed, and the routine blood tests such as eosinophils count were not conducted. At the same time, the acute attack of asthma in children was not studied, which will be our next research direction.

Disclosure of conflict of interest

None.

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References

[1] Papi A, Blasi F, Canonica GW, Morandi L, Richeldi L and Rossi A. Treatment strategies for asthma: reshaping the concept of asthma management. Allergy Asthma Clin Immunol 2020; 16: 75.

[2] Losappio L, Heffler E, Carpentiere R, Fornero M, Cannito CD, Guerrera F, Puggioni F, Monti R, Nicola S, Rolla G and Brussino L. Characteristics of patients admitted to emergency department for asthma attack: a real-LIFE study. BMC Pulm Med 2019; 19: 107.

[3] Fergeson JE, Patel SS and Lockey RF. Acute asthma, prognosis, and treatment. J Allergy Clin Immunol 2017; 139: 438-447.

[4] Zhu YF, Mao JB, Yang YY and Yuan Y. Training and practice of full-time nurses in the management of chronic respiratory diseases. Chin J Nurs Educ 2020; 17: 396-400.

[5] Li N. New progress in outpatient care of patients with bronchial asthma. Electr J Pract Clin Nurs Sci 2019; 4: 190.

[6] Chen JP. Practice and discussion of one-stop service mode in hospital preparation center. Hosp Manag Forum 2019; 36: 30-32, 14.

[7] Maltby S, McDonald VM, Upham JW, Bowler SD, Chung LP, Denton EJ, Fingleton J, Garrett J, Grainge CL, Hew M, James AL, Jenkins C, Katsoulotos G, King GG, Langton D, Marks GB, Menzies-Gow A, Niven RM, Peters M, Reddel HK, Thien F, Thomas PS, Wark PAB, Yap E and Gibson PG; Severe Asthma Expert Forum contributors. Severe asthma assessment, management and the organisation of care in australia and new zealand: expert forum roundtable meetings. Intern Med J 2021; 51: 169-180.

[8] Powell CV. Acute severe asthma. J Paediatr Child Health 2016; 52: 187-191.

[9] Asthma Group of Chinese Thoracic Society; China Asthma Alliance. The Chinese experts' consensus on the evaluation and management of asthma exacerbation. Chin J Intern Med 2018; 57: 4-14.

[10] Corren J, Castro M, Chanez P, Fabbri L, Joish VN, Amin N, Graham NMH, Mastey V, Abbé A, Taniou C, Mahajan P, Teper A, Pirozzi G and Eckert L. Dupilumab improves symptoms, quality of life, and productivity in uncontrolled persistent asthma. Ann Allergy Asthma Immunol 2019; 122: 41-49, e2.

[11] Steiner GZ, Ee C, Dubois S, MacMillan F, George ES, McBride KA, Karamacoska D, McDonald K, Harley A, Abramov G, Andrews-Marney ER, Cave AE and Hohenberg MI. "We Need a One-Stop-Shop": co-creating the model of care for a multidisciplinary memory clinic with community members, gps, aged care workers, service providers, and policy-makers. BMC Geriatr 2020; 20: 49.

[12] Shen MM and Xia CC. Analysis of one-stop service system based on hospital management. Inf Commun 2020; 143-144.

[13] Wan OYK, Taithongchai A, Veiga SI, Sultan AH and Thakar R. A one-stop perineal clinic: our eleven-year experience. Int Urogynecol J 2020; 31: 2317-2326.

[14] Xia Y, Zhu CY and Chen Y. Practice and effect of one-stop service of dental clinic for old people. Shanghai J Stomatol 2018; 27: 433-435.

[15] Munkhuu B, Liabsuetrakul T, Chongsuvivatwong V, McNeil E and Janchiv R. One-stop service for antenatal syphilis screening and prevention of congenital syphilis in ulaanbaatar, mongolia: a cluster randomized trial. Sex Transm Dis 2009; 36: 714-720.

[16] Xue H, Sun JP, Shan D and Hu YY. A cost-utility study on HIV/AIDS 'One-stop service' pilot at county level. Chin J Prev Med 2015; 49: 501-505.
[17] Adeniyi YC and Adeniyi AF. Development of a community-based, one-stop service centre for children with developmental disorders: changing the narrative of developmental disorders in Sub-Saharan Africa. Pan Afr Med J 2020; 36: 164.
[18] Suphanchaimat R, Putthasri W, Prakongsai P and Tangcharoensathien V. Evolution and complexity of government policies to protect the health of undocumented/illegal migrants in thailand-the unsolved challenges. Risk Manag Healthc Policy 2017; 10: 49-62.
[19] Tien LC, Wu YL, Lin TW and Wang SS. Different perceptions of interprofessional collaboration and factors influencing the one-stop service for sexual assault victims in Taiwan. J Interprof Care 2017; 31: 98-104.
[20] Watanabe N, Morikawa G, Kubota K, Okazawa K, Tanaka C and Horiuchi M. A clinical pathway based on medical and nursing teamwork in drug management facilitates integrated community care for elderly patients with chronic heart failure. Yakugaku Zasshi 2018; 138: 797-806.
[21] Asmirajanti M, Hamid AYS and Hariyati TS. Clinical care pathway strenghens interprofessional collaboration and quality of health service: a literature review. Enferm Clin 2018; 28: 240-244.
[22] Bhogal SK. A question of time: systemic corticosteroids in managing acute asthma in children. Curr Opin Pulm Med 2013; 19: 73-78.
[23] Song GL. Study on the effect of clinical nursing path on bronchial asthma. Electr J Integr Tradit Chin West Med Cardiovasc Dis 2020; 8: 88, 148.
[24] Pan XL. Observation on the application effect of clinical nursing pathways in patients with bronchial asthma. Heilongjiang J Tradit Chin Med 2020; 49: 302-303.
[25] Luo M, Zhao J, Li XL, Chen SZ and Wang H. Application of one-stop precision education platform in auxiliary examination of inpatients. Mod Clin Nurs 2019; 18: 48-52.
[26] Chen LF. Application effect of clinical nursing pathway in elderly patients with bronchial asthma. Nurs Pract Res 2019; 16: 44-46.
[27] Wu LQ. The method and effect observation of applying clinical nursing path in the nursing of patients with bronchial asthma. Electr J Clin Med Lit 2020; 7: 6-7.
[28] Castro R, Senecat J, de Chalendar M, Vajda I, Dan D and Boncz B; EURORDIS Social Policy Advisory Group. Bridging the gap between health and social care for rare diseases: key issues and innovative solutions. Adv Exp Med Biol 2017; 1031: 605-627.
[29] Zhang XX. Observation on the effect of clinical pathway combined with one-stop service nursing on treatment compliance and hospitalization time of patients with lung cancer chemotherapy. J Pract Med Tech 2020; 27: 803-805.