An Investigation of the Efficacy of Glycine Theophylline Sodium Extended-Release Tablets in the Treatment of Bronchial Asthma

Rong Fan, Wei Xiao, Weihua Hu, Zhu Wu*
Jingzhou First People's Hospital, Jingzhou 434000, China.

Abstract: Objective: To observe the effect of treatment with theophylline extended-release tablets in patients with bronchial asthma. Methods: The medical records of 76 asthma patients admitted from 2020.8 to 2022.9 were extracted. 38 cases in the reference group received conventional basic treatment and 38 cases in the observation group received conventional + sodium theophylline glycinate treatment, and the condition control of the patients in the two groups was compared. Results: The patients in the observation group all disappeared from the disease symptoms earlier than the reference group ($P < 0.05$). In terms of total effective rate, the difference between the reference group and the observation group was 65.79% vs 92.11% ($P < 0.05$). Conclusion: Oral treatment with sodium theophylline glycinate is recommended for asthma patients to better control their condition.

Keywords: Bronchial Asthma; Sodium Theophylline Glycinate; Effect Observation

Introduction

The prevalence of asthma within the adult population in China is roughly 4.2%, and the overall vacancy rate of asthma is low, around 28.5% in urban areas. The pathological characteristics of asthma include airway hyperresponsiveness and significant airflow restriction, and patients will experience varying degrees of wheezing and coughing, which can easily cause airway remodeling conditions during the progressive prolongation of the disease course and rapid progression during acute exacerbations, increasing the morbidity and mortality rate[1]. Theophylline extended-release tablets have anti-inflammatory properties, dilate the airways and strengthen the respiratory drive, and this paper focuses on their effectiveness in the treatment of asthma, as reported below.

1. Data and methods

1.1 General information

The 76 patients with asthma who participated in this study had clear diagnostic findings, normal cognition and tolerance to the drugs used, and were seen from 020.8 to 2022.9. They were divided into two groups according to the randomisation principle, and the groups were as follows.

Reference group (n=38): 21 males and 17 females each, minimum and maximum age 39 and 76 years respectively, mean (54.28±6.23) years, minimum and maximum duration of illness 2-11 years, mean (6.27±1.09) years.

Observation group (n=38): 19 males and 19 females, minimum and maximum age 37 and 78 years, mean (55.26±6.30) years, minimum and maximum duration of illness 3 to 13 years, mean (6.44±1.22) years.

The age and gender of the patients in the two groups were similar, and none of the differences were significant ($P > 0.05$).

1.2 Methods

Patients in each group were advised to take the initiative to quit smoking, eat a balanced diet, strengthen respiratory function exercise, and give conventional treatments such as oxygen therapy, correction of acid-base imbalance, cough suppression and anti-infection in accordance with the actual condition. In the observation group, glycine theophylline sodium extended-release tablets were added, 1 tablet/time, 2 times/d.

Continuous medication for 3 months as a course of treatment.

1.3 Observation index

Record the disappearance time of cough, wheezing, coughing sputum and croup in each group. The following criteria were formulated to determine the efficacy: ①clinical control: cough and croup disappeared completely, possibly with occasional attacks, but only to a mild level and able to relieve themselves; ②significant effect: the main symptom expression of the disease was significantly reduced; ③improved: some symptoms gained improvement compared with those before treatment with medication, but with frequent attacks.

(iv) Ineffective: the above criteria were not met, or the condition deteriorated. Total effective rate = [number of people in this group (n) - number of invalid] / n × 100%.

1.4 Statistical processing

SPSS28.0 software was used to process the data. When the measurement and counting data conformed to the law of normal distribution, the test with was used respectively. Criteria for judging differences: $P < 0.05$.

2. Results

2.2 Time to disappearance of symptoms

Compared with the reference group, the time of disappearance of asthma symptoms was earlier in all patients in the observation group, and the difference was confirmed to be statistically significant by analysis ($P < 0.05$), Table 1.

Table 1 Comparison of the time to disappearance of the main symptoms in the two groups ($\bar{x} \pm s, d$)

Group（n）	Cough	Gasping for breath	Coughing up sputum	rumbling sound
Observation group（38）	5.01±0.42	2.07±0.35	4.92±0.38	4.42±0.43
Reference group（38）	6.63±0.39	3.75±0.44	6.07±0.47	5.92±0.56

2.2 Clinical efficacy

In the observation group, 26 cases reached the clinical control assessment standard, with a total effective rate as high as 92.11%; in the reference group, the corresponding values of the above two indicators were 12 cases and 65.79%, and the effect of disease treatment was better in the observation group than in the reference group ($P < 0.05$), Table 2.

Table 2 Comparison of the efficacy of the two groups of patients[n，(%)]

Group（n）	Clinical control	Visible effect	Good turnaround	Invalid	Total validity

Observation group（38）	26	5	4	3	35（92.11）
Reference group（38）	12	7	6	13	25（65.79）

3. Discussion

The pathogenesis of asthma is still unclear, but scholars at home and abroad generally believe that the inflammatory response and airway hyperreactivity are involved in the development of the disease. During acute exacerbations, patients may experience increased airway inflammation, local smooth muscle contraction, mucosal oedema, epithelial damage and other pathological changes, which in turn cause abnormal ventilation, wheezing and other manifestations to gradually worsen, and may also be accompanied by hypoxia [2].

The clinical goals for patients with asthma include reducing the risk of acute exacerbations, inhibiting the deterioration of the disease and improving their quality of life. The mechanism of action of theophylline extended-release tablets is to inhibit the activity of phosphodiesterases (PDEs), which in turn regulates calcium levels in airway smooth muscle, resists the contractile force exerted by adenine on the airway, strengthens the contraction level of the diaphragm, etc., which in turn relaxes the smooth muscle in a pre-spastic state and significantly improves the patient's respiratory function. Theophylline also has anti-inflammatory properties, modulates the body's immune level and induces central excitation[3]. The slow release of theophylline after oral administration of extended-release tablets maintained the antiasthmatic effect for up to 12h after a single dose, which is the reason for the twice daily dosing in this study, and maintained the relative stability of theophylline blood levels in patients around the clock, thus controlling the symptoms of the disease more effectively. The time to resolution of cough, wheeze, sputum and rales was (5.01±0.42)d, (2.07±0.35)d, (4.92±0.38)d and (4.42±0.43)d in the observation group and (6.63±0.39)d, (3.75±0.44)d, (6.07±0.47)d and (5.92±0.56)d in the reference group, respectively. The difference was significant and the total effective rate of the observation group was also above that of the reference group, confirming the effectiveness of sodium theophylline glycinate in the treatment of asthma disease with multiple data sets, which is worth promoting.

References.

[1] Zhao H, Zhao J. Effectiveness of glycine theophylline sodium extended-release tablets in the treatment of bronchial asthma [J]. China Medicine Herald, 2022, 19(01): 106-109.

[2] Cao YJ. Efficacy and safety of theophylline extended-release tablets in the treatment of adult bronchial asthma[J]. Psychological Monthly,2020,15(08):52-53.

[3] Qi XF, Cao Y, Wan Ruixiang. Clinical observation of 54 cases of bronchial asthma treated with theophylline extended-release tablets [J]. Shandong Pharmaceutical Industry,2003(05):48-49.

Author Bio

First author.

Fan Rong (1980.1.10-), F, Han, Place of origin: Hubei. Jingzhou, MA, Title: Attending, Unit: Jingzhou First People's Hospital, Department: Department of Respiratory and Critical Care, Major research interests: Chronic obstructive pulmonary disease, interstitial lung disease, pulmonary embolism, pulmonary hypertension, ECMO life support, etc.

Corresponding author.

Wu zhu (1982.5.14-), Male, Han Nationality, Place of Origin: Xiangtan, Hunan Province, Master's Degree, Title: Attending Physician, Unit: Jingzhou First People's Hospital, Department: Breast Surgery, Main Research Interests: Comprehensive treatment of breast cancer, diagnosis and treatment of non-lactating mastitis, postoperative reconstruction of

breast tumors, etc.

Second author.

Xiao Wei (1969.9.8-), Male, Ethnicity: Han, Origin: Jingzhou, Hubei Province, Highest Education: Master, Title: Chief Physician, Unit: Jingzhou First People's Hospital, Department: Department of Respiratory and Critical Care, Main research interests: chronic obstructive pulmonary disease; bronchial asthma; lung cancer; pulmonary embolism; interstitial lung disease, etc.

Third author.

Hu Weihua (1977.10.12-) Female, Ethnicity: Han, Place of origin: Jingzhou, Hubei, Highest education: Master, Title: Chief Physician

Unit: Jingzhou First People's Hospital, Department: Department of Respiratory and Critical Care Main research interests: chronic obstructive pulmonary disease; bronchial asthma; lung cancer; interstitial lung diseases, etc.