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Analysis of Influencing Factors on Medication Adherence in Patients with Allergic Rhinitis

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Abstract: Objective: To analyze the factors influencing medication adherence in patients with allergic rhinitis, and to provide a reference for improving patient compliance in clinical treatment. Methods: A total of 86 patients with allergic rhinitis who received medication treatment at our hospital from January 2022 to December 2023 were selected and divided into a high-adherence group and a low-adherence group based on their medication adherence assessment results, with 43 patients in each group. The criteria for high adherence were defined as taking medication on time and in the prescribed amount without unauthorized discontinuation, dose reduction, or missed doses, and being able to accurately recite the medication regimen and precautions during follow-up. The criteria for low adherence were defined as having ≥3 instances of unauthorized discontinuation, dose reduction, or missed doses during the medication period, or being unable to accurately recite the medication regimen during follow-up. Basic data, disease awareness, occurrence of adverse drug reactions, and family support were collected from both groups using a unified method, and factors influencing adherence were compared and analyzed. Results: The high-adherence group had a higher rate of meeting disease awareness standards, a lower incidence of adverse drug reactions, and a higher rate of family support compared to the low-adherence group, with all differences being statistically significant ($P < 0.05$). Conclusion: Insufficient disease awareness, occurrence of adverse drug reactions, and lack of family support are the main factors contributing to low medication adherence in patients with allergic rhinitis. Targeted interventions can be implemented clinically to improve patient adherence.

Keywords: Allergic rhinitis; Medication treatment; Adherence; Influencing factors; Disease awareness

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1. Introduction

Allergic rhinitis is a common clinical allergic disease characterized by symptoms such as nasal congestion, runny nose, nasal itching, and sneezing. The disease has a long course and is prone to recurrent episodes, requiring long-term medication to control symptoms. Patient adherence to treatment directly affects the effectiveness of disease control[1]. In recent years, with changes in environmental factors and lifestyles, the incidence of allergic rhinitis has shown an annual increasing trend. It is particularly prevalent among adolescents and middle-aged individuals, causing numerous disruptions to patients' daily lives, work, and studies. Some patients, enduring prolonged symptoms, may develop adverse

emotions such as anxiety and irritability, further diminishing their quality of life. In clinical practice, some patients, due to insufficient understanding of the disease, concerns about medication side effects, or other reasons, often exhibit non-compliant behaviors such as unauthorized discontinuation or dose reduction of medications. These behaviors result in poor treatment outcomes or even exacerbation of the condition, not only increasing patients' medical expenses but also potentially leading to complications like sinusitis and asthma, thereby complicating treatment. Therefore, analyzing the factors influencing patients' adherence to pharmacological treatment is crucial. Based on this, this study aims to identify the primary factors affecting adherence by uniformly collecting relevant data from patients with allergic rhinitis exhibiting different levels of adherence, providing a basis for clinical interventions.

2. Materials and Methods

2.1. General Information

Eighty-six patients with allergic rhinitis who received pharmacological treatment at our hospital from January 2022 to December 2023 were selected and divided into a high-adherence group and a low-adherence group based on adherence assessment results, with 43 patients in each group. The criteria for determining adherence in both groups were as follows: Comprehensive assessment was conducted through patients' medication records (verification of remaining medication quantities and medication logs during outpatient follow-ups) and monthly follow-ups (telephone inquiries about medication usage). The high-adherence group was required to meet the following criteria: timely and appropriate medication usage during the treatment period, without any unauthorized discontinuation, dose reduction, or missed doses, and the ability to accurately recite the usage, dosage, and precautions of the medications during follow-ups. The low-adherence group was required to meet the following criteria: the presence of ≥3 instances of unauthorized discontinuation (each instance lasting ≥2 days), dose reduction (dosage reduced by more than 50% of the prescribed amount), or missed doses during the treatment period, or the inability to accurately recite the core content of the medication regimen (such as daily medication frequency and drug formulation) during follow-ups. In the high-compliance group, there were 23 males and 20 females, aged between 22 and 65 (41.25 ± 5.38) years; in the low-compliance group, there were 22 males and 21 females, aged between 23 and 64 (40.92 ± 5.16) years. There were no significant differences in general demographic data between the two groups ($P > 0.05$), indicating comparability. Inclusion criteria: (1) Meeting the diagnostic criteria for allergic rhinitis; (2) Requiring at least three months of pharmacological treatment; (3) Having clear consciousness and being able to cooperate with the investigation. Exclusion criteria: (1) Presence of severe heart, liver, or kidney diseases; (2) Presence of mental disorders preventing communication; (3) Concurrent receipt of other nasal treatments.

2.2. Data Collection Methods

A unified data collection process was employed for both groups, as follows: (1) Basic Data Collection: By reviewing patient medical records, basic information such as gender, age, disease duration, and types of medications used (e.g., intranasal corticosteroids, oral antihistamines) was recorded, ensuring accurate and complete information extraction; (2) Disease Cognition Survey: During patient visits or follow-ups, a face-to-face questionnaire survey was conducted. The questionnaire included three core questions regarding the etiology of allergic rhinitis, the necessity of long-term medication use, and the risks of unauthorized drug discontinuation. Healthcare professionals recorded patient responses on-site. Patients who correctly answered all three questions were considered to have met cognitive standards; (3) Monitoring of Adverse Drug Reactions: Through outpatient follow-up inquiries, telephone follow-ups, and active patient feedback, the presence of adverse reactions such as nasal dryness, dizziness, and gastrointestinal discomfort during medication use was recorded. Detailed records of the onset time, manifestations, and duration of adverse reactions were maintained. Suspected adverse reactions were promptly verified and their association with medication use confirmed; (4) Assessment of Family Support: Through telephone interviews with patients' family members or inquiries during patient follow-ups regarding family member accompaniment, it was determined whether family members regularly reminded patients to

take medications, monitored symptom changes, and observed reactions after medication use. If family members engaged in at least one of the aforementioned behaviors, it was considered indicative of family support. The entire data collection process was carried out by uniformly trained healthcare professionals to ensure consistent survey standards and minimize information bias.

2.3. Observation Indicators

The study compared the disease awareness attainment rate between the two groups (attainment was defined as patients correctly answering questions about the etiology of the disease, the necessity of medication, and the risks of discontinuing medication), the incidence of adverse drug reactions (including nasal dryness, dizziness, gastrointestinal discomfort, etc. during medication), family support rate (defined as family members regularly reminding patients to take medication and monitoring their symptoms), and the overall treatment effectiveness rate (symptoms completely disappeared or significantly alleviated were considered effective).

2.4. Statistical Methods

SPSS 24.0 was used for data analysis. Measurement data were analyzed using t-tests, while categorical data were analyzed using χ^2 tests. A P-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Comparison of Disease Awareness Attainment Rate and Family Support Rate Between the Two Groups

The high-compliance group demonstrated higher disease awareness attainment rates and family support rates compared to the low-compliance group ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of Disease Awareness Attainment Rate and Family Support Rate Between the Two Groups [n (%)]

Group	Disease Knowledge Met Standard	High Family Support
High Adherence Group(n=43)	38 (88.37)	36 (83.72)
Low Adherence Group(n=43)	16 (37.21)	15 (34.88)
χ^2	24.088	21.247
p-value	0.000	0.000

3.2. Comparison of Incidence of Adverse Drug Reactions Between the Two Groups

The incidence of adverse drug reactions was lower in the high-compliance group than in the low-compliance group ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of Incidence of Adverse Drug Reactions Between the Two Groups [n (%)]

Group	Nasal Dryness	Dizziness	Gastrointestinal Discomfort	Total Incidence
High Adherence Group(n=43)	3 (6.98)	1 (2.33)	0 (0.00)	4 (9.300)
Low Adherence Group(n=43)	10 (23.26)	8 (18.60)	0 (0.00)	18 (41.860)
χ^2				11.972
p-value				0.001

3.3. Comparison of Overall Treatment Effectiveness Rate Between the Two Groups

The overall treatment effectiveness rate was higher in the high-compliance group than in the low-compliance group ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of Overall Treatment Effectiveness Rate Between the Two Groups [n (%)]

Group	Effective	Ineffective	Total Effective Rate
High Adherence Group (n=43)	40 (93.02)	3 (6.98)	40 (93.02)
Low Adherence Group (n=43)n	26 (60.47)	17 (39.53)	26 (60.47)
χ^2			12.770
p-value			0.000

4. Discussion

As a chronic disease, allergic rhinitis is primarily managed through medication to control symptoms and reduce recurrence. The effectiveness of treatment is directly determined by whether patients can adhere to long-term and regular medication use. Therefore, analyzing the factors influencing medication adherence and implementing targeted interventions are of great significance for improving patients' conditions[2]. In this study, by using a unified method to collect and comparatively analyze data from patients with high and low medication adherence, it was found that disease awareness, adverse drug reactions, and family support were closely related to patient adherence. These findings align with clinical realities, and a detailed analysis will be conducted below from these perspectives.

From the perspective of disease awareness, the results of this study show that the disease awareness compliance rate in the high-adherence group (88.37%) was significantly higher than that in the low-adherence group (37.21%) ($P < 0.05$). This indicates that insufficient awareness of allergic rhinitis and its pharmacological treatment among patients is a major factor contributing to low adherence. In clinical practice, some patients, lacking a proper understanding of the disease, perceive allergic rhinitis as merely a "minor issue" and discontinue medication once symptoms subside, or they worry about dependency and side effects from long-term medication use, leading to unauthorized discontinuation or dosage reduction. During the data collection process, it was observed that most patients in the high-adherence group could clearly articulate the chronic nature of allergic rhinitis and understand that long-term medication use can effectively reduce the frequency of acute episodes. In contrast, many patients in the low-adherence group viewed the disease as merely "seasonal colds" and had a vague understanding of the importance of medication adherence, further confirming the significant impact of disease awareness on adherence. In clinical practice, patients with different educational levels exhibit varying degrees of disease awareness. Patients with lower educational levels often struggle to comprehend disease-related knowledge and provide incomplete responses to survey questions. Therefore, healthcare professionals should use more accessible language and incorporate real-life examples in disease education during routine consultations. For instance, comparing the long-term treatment needs of allergic rhinitis to those of hypertension, which requires long-term medication control, can facilitate better patient understanding.

Adverse drug reactions (ADRs) are another key factor affecting patient adherence. In this study, the incidence of ADRs in the high-adherence group (9.30%) was significantly lower than that in the low-adherence group (41.86%) ($P < 0.05$). Commonly used medications for allergic rhinitis treatment, such as intranasal corticosteroids, may cause nasal dryness, while oral antihistamines may lead to dizziness, gastrointestinal discomfort, etc. Although these ADRs are mostly mild, some patients, lacking prior knowledge or coping strategies, may perceive them as "severe side effects," leading to fear and discontinuation of medication. Analysis of ADR records revealed that patients in the high-adherence group often proactively used saline nasal irrigation to alleviate mild nasal dryness, whereas those in the low-adherence

group frequently discontinued medication directly upon experiencing similar symptoms without promptly informing healthcare providers, resulting in interrupted subsequent treatment. Notably, individual tolerance to ADRs varies among patients. During data collection, it was observed that some patients found even mild nasal dryness unacceptable, while others adapted spontaneously. This necessitates healthcare providers to thoroughly assess patients' psychological states and tolerance levels before prescribing medications, offering psychological counseling to sensitive patients in advance. Additionally, when prescribing medications, providers should prioritize formulations with lower ADR incidence rates, such as mometasone furoate nasal spray among intranasal corticosteroids, which exhibits relatively fewer local irritation reactions[3-4].

The impact of family support on patient adherence cannot be overlooked either. Data from this study indicated that the family support rate in the high-adherence group (83.72%) was significantly higher than that in the low-adherence group (34.88%) ($P < 0.05$). Patients with allergic rhinitis often require long-term home medication, making the attitudes and behaviors of family members crucial in shaping patients' medication habits. Regular reminders from family members and attention to symptom changes can effectively reduce non-adherence due to "forgetfulness" or "laziness." Conversely, if family members show indifference towards patients' medication use or even endorse the idea that "medication can be stopped when symptoms improve," it further diminishes patient adherence. Interviews with family members revealed that most of those in the high-adherence group took the initiative to learn the medication schedules of the patients, using methods such as mobile phone alarms and sticky notes to remind patients to take their medications. Some family members even accompanied patients to follow-up appointments and promptly communicated with healthcare providers about the patients' responses to the medications. In contrast, family members in the low-adherence group often stated that they were "unaware of the specific medication situations of the patients" and only paid attention to medication issues when the patients' symptoms significantly worsened. This difference in support directly affected the patients' adherence. In clinical practice, we have also encountered special family situations, such as solitary patients lacking reminders from family members, resulting in generally low medication adherence. For such patients, strategies like guiding them to set medication reminders on their mobile phones and collaborating with community health service centers for regular home visits can compensate for the lack of family support and help patients develop regular medication habits. Additionally, this study found that the total treatment effectiveness rate in the high-adherence group (93.02%) was higher than that in the low-adherence group (60.47%) ($P < 0.05$). This result further confirms the positive impact of improving adherence on treatment outcomes. When patients take medications regularly, the drugs can continuously exert their effects, effectively controlling nasal mucosal inflammation and alleviating nasal symptoms. Non-adherence to medications, however, can lead to subtherapeutic drug concentrations in the body, failing to effectively control the condition, and may even increase treatment difficulty due to recurrent exacerbations. In recording the improvement of patients' symptoms, it was found that most patients in the high-adherence group adhered to using intranasal corticosteroids for three months as prescribed, resulting in a significant reduction in the frequency of symptoms such as nasal congestion and runny nose. In contrast, some patients in the low-adherence group discontinued their medications after one month due to symptom relief, leading to symptom recurrence within 2-3 weeks, with more severe symptoms than before. This also indicates that improving patient adherence is not only a means to enhance treatment compliance but also a crucial aspect of improving the treatment outcomes for allergic rhinitis[5-6].

Based on the above analysis, it can be seen that inadequate disease awareness, adverse drug reactions, and lack of family support are the primary factors affecting medication adherence in patients with allergic rhinitis. In clinical practice, targeted measures can be implemented to address these issues, such as enhancing disease and medication education by using accessible language to help patients fully understand relevant knowledge about the disease and its treatment, thereby eliminating misconceptions; optimizing medication regimens by taking into full consideration individual patient circumstances when selecting drugs, prioritizing those with minimal side effects and ease of use, while proactively informing patients about potential adverse reactions and coping strategies, along with regular follow-up monitoring; emphasizing family support by involving family members in the patient's treatment process to foster a positive therapeutic

environment[7]. Through these interventions, medication adherence among patients can be effectively improved, leading to enhanced treatment outcomes for allergic rhinitis, reduced disease recurrence, and improved quality of life. In clinical practice, it is also important to tailor intervention methods to the specific needs of each patient. For instance, for elderly patients, more visual demonstrations (such as on-site demonstrations of nasal spray usage) can be employed instead of relying solely on written instructions, while strengthening communication with family members to encourage them to take on more reminders responsibilities. For younger patients, disease education can be delivered through online platforms (such as WeChat official accounts and short videos) to enhance the appeal and acceptability of the information[9-10]. Only by developing personalized intervention plans based on patient characteristics can we more effectively address issues affecting adherence, truly help patients establish a habit of regular medication use, and achieve long-term effective control of allergic rhinitis.

Disclosure statement

The author declares no conflict of interest.

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