

# Therapy efficacy of hyperreactive rhinitis by the combination of intranasal steroid and oral H1-antihistamine

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**Abstract.** Background Hyperreactive rhinitis (HRR) is identified as rhinitis which has at least two symptoms such as sneeze, itches, watery secretion and nasal blockage. Little is known about the pathology of HRR, as well as its clinical features and treatment. Objective To investigate efficacy HRR by combined therapy with intranasal steroids and antihistamines Methods The age, gender, predisposing factors and clinical symptoms of 200 HRR patients were analyzed. Both intranasal steroids and antihistamines were applied for 8 weeks. Symptoms were assessed with VAS score before and after the treatment. Result: Before the therapy, 87% of HRR patients showed persistent symptoms; 69% complained about severe and persistent effects on the quality on the life; sneezing (96%) and rhinorrhea (78%) were the top 2 symptoms reported; All patients completed the 8-wk combined therapy with intranasal steroids and antihistamines; 96% patients were satisfied with the therapy, with all symptoms except wheezing have been clear relief ( $p < 0.05$ ); the remaining 4% reported the unsatisfied result of the therapy. Conclusion The combined therapy with intranasal steroids and antihistamines controlled most of clinical symptoms of HRR.

## 1 Instruction

Rhinitis is an extremely common rhinopathy. Rhinitis has been divided into four main categories: infectious rhinitis, allergic rhinitis (AR), structural rhinitis, and non-allergic rhinitis (NAR). Differential diagnosis of AR from NAR is often difficult because of their similar clinical presentation. NAR is now a diagnosis of exclusion characterized by similar symptoms to AR, but with no allergic sensitization-related symptoms and signs of infection [1]. Hyperreactive rhinitis (HRR) is identified as the combination of AR and NAR because of similar symptoms.

HRR affects a significant number of patients in clinical practice. Studies have shown an increase in the prevalence of asthma in patients with HRR[2] it has been hypothesized that there was a link between upper and lower airways beyond allergy associated inflammation. Our current study focused on the efficacy of one combined therapy with intranasal steroid and oral antihistamine on HRR.

## 2 Materials and methods

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## 2.1 Clinical data

200 consecutive untreated patients (110 females and 90 males), who were diagnosed of HRR, participated the study. The cases were collected from the files recorded between January, 2015 and December, 2015, from the Department of Otolaryngology, Head and Neck Surgery of the University of China-Japan Union Hospital attached to Jilin University, China. The study was approved by the institutional review board of China-Japan Union Hospital. All the participants provided written informed consent before the study.

## 2.2 Clinical questionnaire and medical interview

Data of the initial evaluation of NAR patients were extracted from the medical history obtained during their first visit to our center. A clinical questionnaire, a complete file of physical examination and symptoms were included. Visual Analogue Scale (VAS) was used to evaluate the severity of nasal symptoms before and after the therapy. The range of the score was 0-3: higher scores indicated more severe symptoms, and score 0 indicated no symptoms. One year follow-up evaluation was also conducted after the treatment. NAR was defined by the presence of two or more nasal symptoms (sneezing, itching, rhinorrhea, or nasal obstruction) plus a negative SPT response and serum IgE level specific to aeroallergens.

## 2.3 Therapy procedures

Patients were treated with once-daily intranasal budesonide for 8 weeks. 200 mg Budesonide were given to patients aged <11 years at study entry and 400 mg to patients aged >11 years at study entry. Simultaneously, Loratadine was administered orally to patients (>12 years old) with 10 mg per day before sleeping for 8 weeks

## 2.4 Statistical analysis

Descriptive statistics (frequency, mean, median, SD, and range) were used to analyze the clinical features of HRR. Paired t-test was used to analyze the therapy results. The data were analyzed with SPSS for Windows 17.0 (SPSS, Inc, Chicago, Ill). P-values < 0.05 were considered statistical significant.

## 3 Result

### 3.1 Age and sex distribution

A total of 200 patients were surveyed in our study. They aged from 4 to 76, with an average of  $38 \pm 14$  years old. 87% of patients showed persistent symptoms and 69% complained about severe and persistent effects on the quality of life; there was no significant difference in the age between male and female patients ( $p=0.983$ )

### 3.2 The efficacy of an 8-wk combined therapy of intranasal steroid and oral antihistamine

All 200 patients were contacted by telephone for follow-up evaluation after 8-wk therapy. All the symptoms were significantly decreased after the 8-wk therapy ( $p<0.05$ ) 96% patients were satisfied

with the therapy, with all symptoms have been clear relief ( $p < 0.05$ ); the remaining 4% reported the unsatisfied result of the therapy but still has decreased VAS after the combined treatment. (Table 1).

**Table 1.** All the HRR symptoms were significantly decreased after the 8-wk combined therapy

VAS	before the treatment				after the treatment				z	p
	0	1	2	3	0	1	2	3		
sneezing(case)	8	24	64	42	80	52	20	0	-5.12	0
secretion(case)	16	20	36	80	104	44	4	0	-5.18	0
blockage(case)	20	32	42	44	128	20	4	0	-5.07	0
ithcy(case)	44	36	24	48	124	28	0	0	-4.46	0

## 4 Discussion

Both NAR and AR are associated with the nasal mucosa hyper-responsiveness and resulted in similar symptoms and physical signs, so we identified the hyperreactive rhinitis (HRR) according to symptoms. Currently, the diagnosis of HRR relies on the clinical symptoms.

Standard treatment reference of HRR has not been established yet. Similar treatment designed for AR has been used to treat to HRR due to the shared symptoms and morbidity between this two types of rhinitis. Studies showed that intranasal steroids such as Budesonide, Fluticasone and Mometasone, could relieve the edema condition of nasal cavity and decrease the symptoms of NAR. Rinne[3] reported that intranasal steroids could successfully control the recurrence of the NAR. Patients with sneezing as a predominant symptom responded well to oral antihistamines. The combination of Flunisolide and Loratadine showed better clinical efficacy than intranasal steroid alone [4]. In our study, 96% patients showed alleviated symptoms of nose, eye and lower airway after a combined therapy of intranasal steroids and oral anti-histamines for 8 weeks, indicating the therapy was effective in HRR treatment. The histamine receptor 3 was the decisive factors in nasal neural system, whereas the target of Loratadine is histamine receptor 1 that mainly responsible to the allergic reaction. Studies have showed that Azelastine decreased all the symptoms of NAR [5] and AR. Azelastine is the intranasal antihistamine commercially available. Studies showed that Azelastine interfered with vasoactive neuropeptide substance P and inhibited the production of leukotrienes B4 and C, which might possibly decrease the expression of nuclear factor-kB, which was a transcription factor for multiple proinflammatory substances[6]. The efficacy of intranasal Azelastine might be further explored to replace Loratadine in the combination therapy to treat NAR and AR.

In conclusion, HRR had it own clinical feature, such as high risk population is adults (30-39), slightly more in female, The combined therapy of intranasal steroid and oral histamines was effective in controlling HRR symptoms. In addition, the individualized therapy procedure needs further consideration for the inter-individual variability of the therapy efficacy observed in our study.

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