

## **Evaluating the Effect of Triamcinolone Acetate Injection in the Inferior Nasal Concha on Improving the Symptoms and Quality of Life of Patients with Allergic Rhinitis Who Underwent Rhinoplasty**

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### **ABSTRACT**

**Introduction:** Allergic rhinitis is the most common allergic disease and has an increasing prevalence. Although corticosteroids are the major treatment option for allergic rhinitis, there is still no consensus on the type of corticosteroid used to improve symptoms. The aim of this study was to evaluate the effect of triamcinolone acetate on improving the symptoms and quality of life of patients with allergic rhinitis who underwent rhinoplasty.

**Materials and Methods:** In this randomized clinical trial, 100 patients were divided into two groups of 50. In the intervention group, 20 mg of triamcinolone was injected and the patients were monitored for one month, and the control group only underwent rhinoplasty. The results were analyzed using SPSS software version 22.

**Results:** The mean symptoms and quality of life after the intervention were significantly different between the two groups. The mean symptoms and quality of life of patients in the triamcinolone group were significantly different, before and after the intervention.

**Discussion:** The results showed that triamcinolone acetate injection in patients who underwent rhinoplasty had a greater effect on reducing symptoms and improving quality of life, in comparison with the control group who only underwent rhinoplasty.

### **KEYWORDS**

Allergic Rhinitis, Rhinoplasty, Triamcinolone, Corticosteroids.

### **Introduction**

Allergic rhinitis is an inflammatory disorder of the nasal mucosa, which is characterized by nasal congestion, rhinorrhea, and itching, and it is often accompanied by sneezing and conjunctival irritation (1). This disease is the most common manifestation of upper airway allergy, affecting 38% to 40% of people (2). Allergic rhinitis occurs in 80% of people with asthma and also 40% of people with allergic rhinitis have some degree of asthma that shows the relationship between the two diseases (3). After the nasal mucosa becomes sensitive to an allergen, the next contact causes the allergen to bind to IgE receptors located on the mast cells, which causes the mast cells to degranulate and release inflammatory mediators that cause symptoms of allergy (4,5). Symptoms then begin with sneezing, followed by runny nose and nasal congestion (5).

The new generation antihistamines, including loratadine, fexofenadine, and cetirizine, are the treatment of choice for allergic rhinitis, but in some cases, some patients remain symptomatic

despite receiving the medication (6). Numerous studies have shown the beneficial effects of corticosteroids, so that nasal glucocorticoid sprays are the most effective maintenance treatment for allergic rhinitis and have few side effects at the recommended doses (7). However, there is still no consensus on choosing the appropriate type of corticosteroid to be used to improve the symptoms of allergic rhinitis. Triamcinolone is a synthetic glucocorticoid compound used due to its anti-inflammatory effects in various diseases such as eczema, allergies, lupus, psoriasis, alopecia, asthma, and autoimmune arthritis (8).

Due to the fact that allergic rhinitis is one of the most important diseases that impose high costs on countries and governments yearly, in this study we investigated the effect of triamcinolone acetate injection in the inferior nasal concha on improving the symptoms and quality of life of patients with allergic rhinitis who underwent rhinoplasty.

## Materials and Methods

This study is a randomized clinical trial. The study population, according to the sampling formula (9), included 100 patients who underwent rhinoplasty in 2017 due to allergic rhinitis. After explaining the aspects of the study and obtaining written consent from the cases, the patients were divided into two groups of 50; the intervention group who received triamcinolone and the control group who only underwent rhinoplasty. In the intervention group, 20 mg of triamcinolone was injected into each inferior nasal concha on the day of operation, and in the control group, no medication was used. One month after the injection, the symptoms and quality of life of the patients in the intervention and control groups were assessed using a standard questionnaire. The questionnaire was designed based on Rhinasthma criteria and included 28 questions about 7 fields of sleep, symptoms of nonallergic rhinitis, practical problems, nasal symptoms, ocular symptoms, and emotions. The answers to the questions were based on a 7-point scale (from 0 to 6) that the lower the score, the better the quality of life. The validity and reliability of the questionnaire have been confirmed in various studies (10). The obtained data were statistically analyzed using SPSS software version 22.

## Results

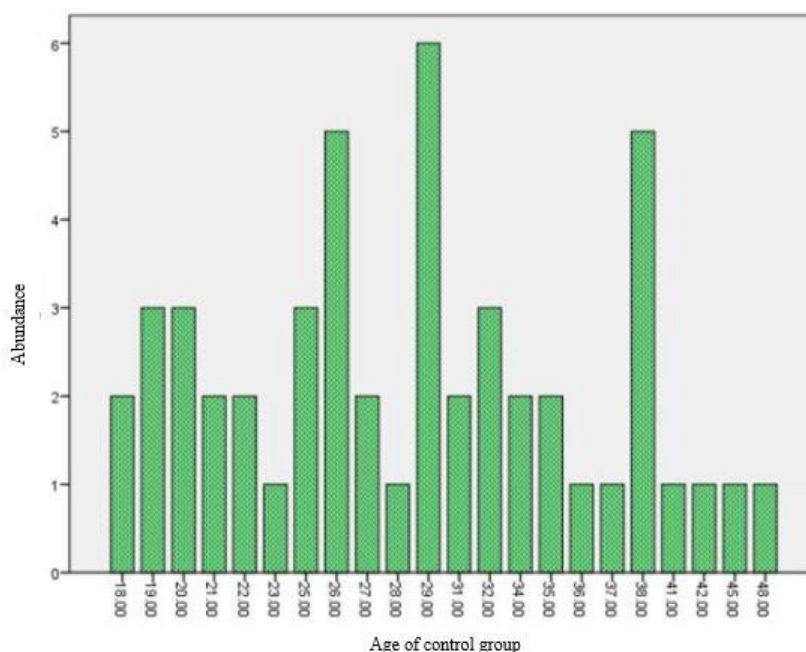
In this study, first, the normality of the studied variables was investigated. The assumption of normality was established for most of the variables and the variables demonstrated a normal distribution. In this study, the statistical population was divided into two groups of 50 people; one intervention group and one control group. According to the results obtained in Table 1, the frequency of women in both groups was higher than men (82% in the control group and 72% in the intervention group).

**Table 1.** Frequency distribution of patients in the two groups based on gender

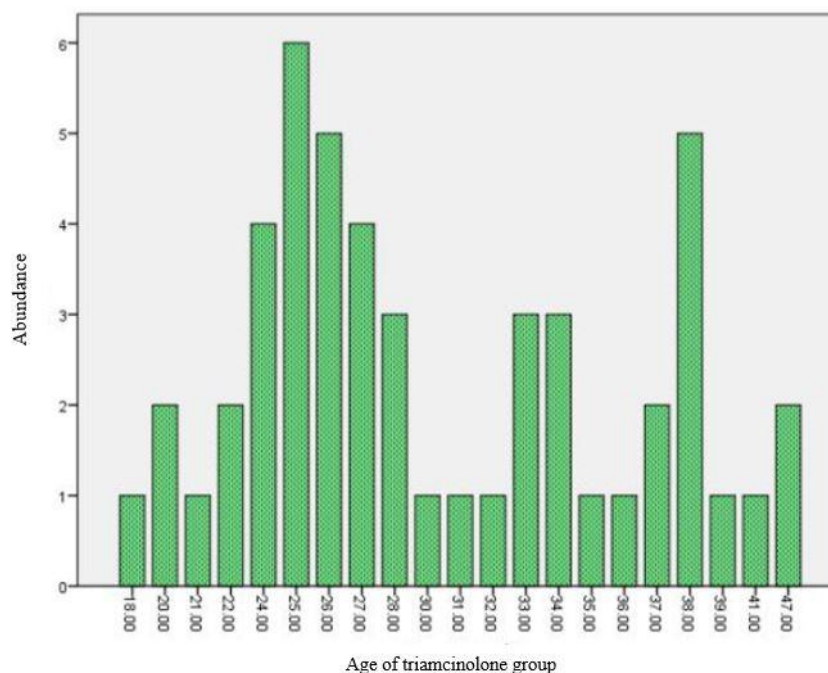
	Gender	Frequency	Percentage	Compression percentage	Cumulative percentage
Control group	Male	9	18	18	18
	Female	41	82	82	100
	Total	50	100	100	
Intervention	Male	14	28	28	28

<b>group</b>	<b>Female</b>	<b>36</b>	<b>72</b>	<b>72</b>	<b>100</b>
	<b>Total</b>	<b>50</b>	<b>100</b>	<b>100</b>	

According to Figures 1 and 2, the mean age of the individuals in the control group was 29 years and in the intervention group was 30 years. The highest frequency of age in the control group was 29 years and in the intervention group was 25 years.



**Figure 1.** Frequency of age in the control group



**Figure 2.** Frequency of age in the intervention group

In order to determine the effect of triamcinolone acetate injection in the inferior nasal concha on improving the symptoms and quality of life of patients with allergic rhinitis undergoing rhinoplasty, the one-sample Kolmogorov-Smirnov test was used (Table 2).

**Table 2.** Findings of the Kolmogorov-Smirnov test (normality of the variables)

Variable	Sample size	Test statistics	Kolmogorov
Control group /before the operation	50	1.307	2.07
Intervention group /before the operation	50	2.605	2.29
Control group / one month after the operation	50	4.041	2.29
Intervention group / one month after the operation	50	0.600	2.20
Age of the control group	50	0.151	0.76
Age of the intervention group	50	0.906	1.18
Gender of the control group	50	14.941	3.52
Gender of the intervention group	50	11.225	3.19

According to the Kolmogorov-Smirnov table at the significance level of  $p > 0.05$ , the studied samples had a normal distribution in the intervention and control groups.

According to Table 3, the mean symptoms and quality of life of patients in the triamcinolone group, before and after surgery was 2.3 and 0.6, respectively, and the standard deviation was 0.81 and 0.27, respectively. As a result, the mean symptoms and quality of life of patients in the triamcinolone group had a significant difference, before and after the intervention ( $p \leq 0.05$ ) (Table 3). Also, in the control group, the mean symptoms and quality of life of patients, before and after the operation, were 2.16 and 1.40, respectively, and the standard deviation was 0.86 and 0.69, respectively, the mean symptoms and quality of life of patients in the control group, before and after the operation, had a significant difference ( $p \leq 0.05$ ) (Table 4).

**Table 3.** Mean score of symptoms and quality of life in the intervention (triamcinolone) group, before and after the intervention

variable	Before intervention			After intervention			P value
Triamcinolone group	Quantity	Mean	SD	Quantity	Mean	SD	0.043
	50	2.30	0.81	50	0.60	0.27	

**Table 4.** Mean score of symptoms and quality of life in the control group, before and after the operation

variable	Before operation			after operation			P value
Control group	Quantity	Mean	SD	Quantity	Mean	SD	0.032
	50	2.16	0.86	50	1.40	0.69	

According to Table 5, the mean score of symptoms and quality of life, after the intervention, in the control group was 1.40 and in the intervention group was 0.60, which demonstrated a significant difference between the two groups, in terms of symptoms and quality of life ( $p \leq 0.05$ ) (Table 5).

**Table 5.** Mean score of symptoms and quality of life in the two groups, after the intervention

variable	one month after the intervention/ Control group			one month after the intervention/ Triamcinolone group			P value
	Quantity	Mean	SD	Quantity	Mean	SD	
Control group/ Triamcinolone group	50	1.40	0.69	50	0.60	0.27	0.049

## Discussion

Respiratory allergies, especially allergic rhinitis, are one of the most common allergies among the Iranian population and are expected to become more prevalent in future years (11). Allergic rhinitis affects forty million people in the United States alone each year, resulting in high treatment costs and reduced productivity (12). Recent studies indicate a high prevalence of allergic rhinitis in Iranian children (13). In 2008, Raqa et al. conducted a study in Isfahan (Iran) on 90 patients with allergic rhinitis, in which they compared the effectiveness of triamcinolone injection in the inferior nasal concha and consumption of cetirizine for 1 month. Raqa stated that a single injection of triamcinolone into the inferior nasal concha is as effective as daily consumption of 10 mg of cetirizine tablets for one month in terms of controlling clinical symptoms and improving the quality of life (13). Also, in a study by Karaulov et al. in 2019, the comparison of Triamcinolone Acetonide and Fluticasone Propionate in the treatment of allergic rhinitis was performed. By studying 250 patients with allergic rhinitis, Karaulov stated that both treatments could be useful in reducing nasal symptoms in adult patients with allergic rhinitis (14). In our study, the frequency of patients in terms of gender in the intervention group was 28% male and 72% female and in the control group 18% male and 82% female, which demonstrated a normal distribution and dispersion in terms of the gender of individuals. The mean symptoms and quality of life of patients in the triamcinolone group before surgery was  $2.30 \pm 0.81$  and after surgery was  $0.60 \pm 0.27$ , with a P-value of 0.043, which showed a significant difference before and after the intervention. Therefore, the triamcinolone injection could effectively reduce the symptoms and improve the quality of life of patients who underwent rhinoplasty. These results were consistent with the findings of a study by Karaulov et al. (14); these results were also consistent with the findings of Meltzer and Mandl, who stated that all major allergy symptoms in people treated with triamcinolone were improved (15,16). Also, the mean symptoms and quality of life of patients in the control group were  $2.16 \pm 0.86$  before surgery and  $1.40 \pm 0.69$  after surgery, with a significance level of 0.032, which demonstrated a significant difference before and after the surgery; therefore, rhinoplasty was also effective in reducing symptoms of patients and improving their quality of life. However, by comparing the symptoms and quality of life of patients after the intervention in both groups, it was found that receiving triamcinolone in the intervention group had a greater effect on the symptoms of allergic rhinitis and quality of life compared to the control group. This study is the first study in Iran to investigate the effect of triamcinolone acetate injection in the inferior nasal concha on improving the symptoms and quality of life of patients with allergic rhinitis who underwent rhinoplasty.

Reduction of rhinorrhea, sneezing, pruritus, and convulsions was significant in both treatment groups. This reduction in symptoms was almost similar in both groups, and even in symptoms

such as sneezing, the reduction was greater in the triamcinolone acetate group than in the control group. One of the important features that could be discussed in this study is the feature of allergic rhinitis. The study population was not in a controlled condition after rhinoplasty and as a result, the presence or absence of allergens was not available to us, and avoiding these substances was not proven by the patients, since avoiding allergens can reduce the symptoms and affect our results.

## Conclusion

In general, based on the results of this study, it was found that a single injection of triamcinolone acetate at a dose of 20 mg into each of the inferior nasal conchae of patients who underwent rhinoplasty can significantly reduce the symptoms of allergic rhinitis and, consequently, improve the quality of life of patients.

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