

## Role of nasal douching in chronic allergic rhinitis

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### Abstract

**Objective:** The present study was carried out to evaluate the role of nasal douching in the treatment of allergic rhinitis using daily allergic rhinitis symptom score. **Material & Methods:** 120 patients of chronic allergic rhinitis who attended otorhinolaryngology outdoor of Ananta Institute of Medical Sciences, Rajsamand, Rajasthan were included in the study. patients were divided into two equal groups viz. **group A** (n=60) in which patients were treated with antihistaminics, leukotriene receptor antagonists and intranasal steroid sprays and **group B** (n=60) in which isotonic saline nasal douching was advised to the patients three times a day as an adjunctive to the medical treatment. Patients were followed up after 2 week and 4 weeks. Mean daily allergic rhinitis symptom score were calculated at each follow up and compared between the two groups. **Results:** out of 120 patients, 63 were male and 57 were female. Age of the patients ranges from 20 to 60 years with the mean age of 36.5 years. Mean daily rhinitis scores of group A and group B were 14.6±1.6 and 14.3±2.0 respectively (p value- 3.661) which was reduced to 8.9±2.1 and 7.1±1.8 respectively and the difference was found to be statistically significant (p value <0.0001). At 4th week follow up, the scores of were further reduced to 3.8±1.7 and 2.2±0.9 respectively and the difference was found to be statistically significant (p value <0.0001). **Conclusion:** Nasal douching is an effective method to manage symptoms of allergic rhinitis when used along with other medical treatment including intranasal steroids, antihistaminics and leukotriene receptor antagonists.

**Keywords:** Allergic Rhinitis, Nasal irrigation, Rhinorrhoea, Intranasal steroids, Allergen.

### Introduction

Rhinitis is defined as an inflammation of nasal mucosa and is characterized by symptoms like nasal itching, clear rhinorrhoea, nasal obstruction and sneezing. When symptoms of rhinitis are triggered by an allergen, the resulting condition is referred to as allergic rhinitis. Allergic rhinitis may be seasonal, perennial, or may occur sporadically after specific exposures. Allergic rhinitis can be intermittent (< four days/week or four weeks/year) or persistent (>four days/week, or four weeks/year).

Allergic rhinitis leads to a significant impairment in the quality of life of the patients when measured by various quality of life instruments [1,2]. It can also lead to fatigue and daytime sleepiness, reduced work productivity, impaired cognitive functioning, reduced learning abilities, and impaired sleep [1,3-10].

Nasal douching (also known as nasal irrigation, nasal lavage) is a procedure to rinse the nasal cavity with saline solution. It is an old practice for cleaning and care of upper respiratory tract that was originated in the Ayurvedic medical tradition [11]. Since then the procedure is accepted worldwide as an effective method to treat and prevent upper respiratory tract diseases [12-17].

Nasal saline irrigation is believed to work through making the mucus thinner, making it easy to remove and also by removing some of the allergens from the nasal cavity and by enhancing the mucociliary mechanism. Solution for nasal douching can be isotonic saline (0.9% NaCl) and hypertonic saline (1.5% to 3% NaCl). Both are acidic solutions, with pH varying from 4.5 to 7.

In present study, we used isotonic saline solution for douching purpose.

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## Material & Methods

The present study is a prospective study carried out in Department of Otorhinolaryngology, Ananta Institute of Medical sciences, Rajsamand, Rajasthan during the period from February 2017 to February 2019.

**Setting:** Tertiary care

**Type of study:** Prospective, longitudinal study

**Participants:** 120 patients attended ENT OPD with the symptoms of allergic rhinitis (sneezing, rhinorrhoea, itching in nose) were included in the study. Complete ENT examination of the patients was carried out.

**Types of participants:** All the 120 patients included in the study were divided into following two groups:

**Group A (n=60):** patients were treated with antihistaminics, leukotriene receptor antagonists and intranasal steroid sprays.

**Group B (n=60):** isotonic saline nasal douching was advised to the patients three times a day as an adjunctive to the treatment with antihistaminics, leukotriene receptor antagonists and intranasal steroids.

**Type of intervention:** Participants of group B were advised to perform nasal douching using isotonic nasal solution three times a day.

An easy home remedy was told to all the patients to prepare isotonic solution: mix 250 ml of boiled and cooled water with ¼ teaspoonful common salt (NaCl) and ¼ teaspoonful baking soda (NaHCO<sub>3</sub>). Patients were advised to use the freshly prepared solution every time and were taught to perform nasal douching using 20cc syringe.

## Results

A total of 120 patients were included in present study out of which 63 were male and 57 were female. Age of the patients ranges from 20 to 60 years with the mean age of 36.5 years. All the 120 patients included in the study were divided into following two groups:

**Group A (n=60):** patients were treated with antihistaminics, leukotriene receptor antagonists and intranasal steroid sprays.

**Group B (n=60):** isotonic saline nasal douching was advised to the patients three times a day as an adjunctive to the treatment with antihistaminics, leukotriene receptor antagonists and intranasal steroids. Both the groups were matched for age, gender and severity of symptoms.

Patients were followed up after 2 week and 4 week. Patients were told to calculate and record their daily allergic rhinitis symptom score on diary card given to them. Intensity of these four symptoms were rated as per a 5 graded scale: 0- no symptom, 1- slight, 2- mild, 3- moderate, 4- severe. Total score ranges from 0 to 16. Mean score of these daily data were calculated on each follow up. The results are depicted in table.1

### Exclusion criteria

1. Non-allergic rhinitis
2. Acute and chronic rhinosinusitis
3. Cystic fibrosis
4. Previous history of nasal surgery i.e. turbinate reduction / FESS/ Septoplasty
5. Immunotherapy started within last year
6. Age <20 years > 60 years

**Follow-up and outcome measure:** Patients were followed up after 2 week and 4 week. Patients were told to calculate and record their Mean daily rhinitis score on diary card given to them. Allergic rhinitis symptoms included: 1. Sneezing, 2. Rhinorrhoea, 3. Nasal Obstruction and 4. Nasal itching.

Intensity of these four symptoms were rated as per a 5 graded scale: 0- no symptom, 1- slight, 2- mild, 3- moderate, 4- severe. Total score ranges from 0 to 16. Mean score of these daily data were calculated on each follow up.

**Scoring system used:** Mean daily rhinitis score [18].

**Consent:** Well informed, written consent was taken from all the patients included in the study.

**Ethical permission:** clearance from institutional ethical committee was taken.

**Statistical analysis:** statistical analysis was performed by using student's t-test for independent samples and  $\chi^2$  analysis to compare two groups.

Initially, Mean daily rhinitis scores of group A and group B were  $14.6 \pm 1.6$  and  $14.3 \pm 2.0$  respectively and the difference was not significant (p value- 3.661).

At 2nd week follow up, mean daily rhinitis scores of group A and group B were reduced to  $8.9 \pm 2.1$  and  $7.1 \pm 1.8$  respectively. Similarly, at 4th week follow up, mean daily rhinitis scores of group A and group B were further reduced to  $3.8 \pm 1.7$  and  $2.2 \pm 0.9$  respectively. The difference was found to be statistically significant (p value  $< 0.0001$ ) during each follow up.

**Table-1: Mean daily score of group A and group B at start of therapy and at each follow up.**

		<b>Group A</b>	<b>Group B</b>	<b>P- value</b>
Mean Daily Rhinitis Score (Mean $\pm$ SD)	At start of therapy	$14.6 \pm 1.6$	$14.3 \pm 2.0$	0.3661
	At 2 <sup>nd</sup> week follow-up	$8.9 \pm 2.1$	$7.1 \pm 1.8$	$< 0.0001$
	At 4 <sup>th</sup> week follow-up	$3.8 \pm 1.7$	$2.2 \pm 0.9$	$< 0.0001$

**Group A:** patients were treated with antihistaminics, leukotriene receptor antagonists and intranasal steroid sprays. **Group B:** isotonic saline nasal douching was advised to the patients three times a day as an adjunctive to the treatment with antihistaminics, leukotriene receptor antagonists and intranasal steroids

## Discussion

Allergic rhinitis leads to a significant impairment in the quality of life of the patients when measured by various quality of life instruments. Besides this, allergic rhinitis also increases the healthcare cost because the treatment requires multiple consultations and chronic medical therapy.

Nasal irrigation is a procedure to rinse the nasal cavity with saline solution. It is now accepted globally as an effective method to treat and prevent recurrent upper respiratory tract infection and allergies. Nasal irrigation works by many physiological effects including 1. Cleaning the nasal cavity as saline thins and removes the mucus and crusts, 2. Removal and decrease production of various inflammatory mediators like histamine, prostaglandins, leukotriens etc. 3. Enhancing the mucociliary clearance mechanism [19-24].

In present study, we advised the patients of allergic rhinitis to perform isotonic saline nasal douching three times a day as an adjunctive to the medical treatment (group B) and the results were assessed in form of mean daily rhinitis score and compared with other group of patients who were treated with medical treatment only (group A). Patients were followed up after a period of 2 week and 4 week and the mean daily rhinitis score were calculated during each follow up.

Mean daily rhinitis scores of group A and group B were  $14.6 \pm 1.6$  and  $14.3 \pm 2.0$  respectively (p value- 3.661). At 2nd week follow up, mean daily rhinitis scores of group A and group B were reduced to  $8.9 \pm 2.1$  and  $7.1 \pm 1.8$  respectively and the difference was found to be statistically significant (p value  $< 0.0001$ )

At 4th week follow up, mean daily rhinitis scores of group A and group B were further reduced to  $3.8 \pm 1.7$  and  $2.2 \pm 0.9$  respectively and the difference was found to be statistically significant (p value  $< 0.0001$ ).

The results are suggestive that isotonic saline irrigation is very effective in treatment of allergic rhinitis when used as an adjunctive to the treatment with antihistaminics, leukotriene receptor antagonists and intranasal steroids.

Similar study done in the past on the woodworkers (n=45), exposed to varying level of wood dust, were advised to perform isotonic saline nasal irrigation daily and demonstrated significant improvement in sinus symptoms, mucociliary clearance and expiratory nasal flow [25].

In present study, we used isotonic saline solution (0.9% NaCl) for nasal irrigation three times a day for 4 weeks. Previous studies have been done with hypertonic solution ( $> 0.9\%$  NaCl).

Shose you et al found that hypertonic saline is effective in treatment of allergic rhinitis but its use can lead to inflamed nasal mucosa due to local irritation [26]. Similar study done by Baraniuk et al suggested that hypertonic saline irrigation leads to release of substance P and glandular secretion due to stimulation of nociceptive nerves, which causes pain to the patient [27].

Such types of side effects are not seen with isotonic saline solution.

Other studies done in the past also reported the reduction in nasal symptoms after long term use of nasal irrigation [28,29] except one study done by Nsouli et al, who hypothesized that daily nasal irrigation in healthy adults, could lead to an increase in the number of upper respiratory tract infections [30].

## Conclusion

Nasal irrigation with isotonic saline solution is a safe, inexpensive and effective method to manage symptoms of allergic rhinitis when used along with other medical treatment including intranasal steroids, antihistaminics and leukotriene receptor antagonists. Isotonic solution has no side effects and it helps in decreasing the healthcare cost by reducing the need of medicines and improves in quality of life of the patients.

**What this study adds to existing knowledge?** The present study used the nasal symptom score to assess the results of using isotonic saline irrigation in patients of allergic rhinitis. The score is a very simple and valid instrument to diagnose and to monitor the treatment of allergic rhinitis. The use of this score in routine practice is desirable. The practice of advising isotonic saline irrigation in allergic rhinitis should be enhanced because it is an easy, well tolerated and effective complementary therapy with no adverse effects.

## Author contributions

- Concept and design, Patient care, approval for final print: Dr. Rajiv Kumar Saxena
- Data collection, interpretation of data, write up, data analysis: Dr. Hemendra Bamaniya
- Guidance, final revision: Dr. H.S Bhuie

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## Original Research Article

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