

# Nasal Saline Irrigation for Chronic Rhinosinusitis

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## Abstract

**Background:** Chronic rhinosinusitis (CRS) is a very common disorder in ENT practice. There are many modalities available for the treatment and control of symptoms of allergic rhinosinusitis, varying from antihistamines, corticosteroids, mast cell stabilizers in oral and topical formulations.

**Objective:** The present study was planned to see the influence of nasal saline irrigation on symptomatology of chronic rhinosinusitis.

**Design:** Qualitative study using a questionnaire.

**Methods:** Nasal saline irrigation (NSI) was advised to 53 patients twice a day along with anti-allergic treatment. The control group consists of 47 allergic patients who received only anti-allergic treatment.

**Results:** The symptom score significantly ( $p < 0.001$ ) improved in the group 1 patients using nasal saline irrigation along with anti-allergic treatment.

**Conclusion:** the results of the study suggest that concomitant use of NSI with anti-allergic treatment gives much more satisfactory results than with only anti-allergic treatment in patients with chronic rhinosinusitis.

**Keywords:** Nasal saline irrigation, Chronic rhinosinusitis, Isotonic saline, Allergic rhinitis.

## INTRODUCTION

Chronic rhinosinusitis (CRS) is an extremely common disorder and affects people living in developing as well as developed nations. Allergic rhinitis is one of the important factors predisposing to chronic rhinosinusitis. Other factors leading to CRS are anatomical malformations or variations, polyposis and environmental insults. The therapy is usually directed at the underlying disease as antibiotics are given for purulent nasal discharge and antihistamines and steroids for allergic symptoms. Failure to treat the disease or to diagnose it accurately, leads to persistent symptoms. For example, when non-allergic component co-exists with allergic and is left untreated, antihistamine therapy may be deemed a failure. In such cases with chronic symptoms, nasal saline irrigation can be used as an adjunctive therapy.

Both allergic and non-allergic rhinosinusitis cause inflammation of nasal mucosa characterized by the presence of serous, mucous and mucopurulent secretions ideal growth medium for pathogens like *S. aureus*, *S. epidermidis* and *S. pneumoniae*. Hence, removal of these secretions has important impact on natural history of the disease.

Nasal irrigation with isotonic sodium chloride seems to reduce nasal dryness and facilitates cleaning of thick mucus and crusts from the nasal cavity. NSI has been recommended

for cleaning and removal of debris especially after nasal surgery. Nowadays, otolaryngologists recommend its use for a number of other nonsurgical disorders.

## METHODS

One hundred cases (55 females and 45 males) who were suffering from allergic rhinosinusitis were taken in the study. The patients were of the age from 16 to 76 years. Most of the cases were from rural background but, education status varied from illiterate (15%) to graduates (25%) as shown in the Table 1. The selected patients had symptoms for more than 2 weeks, so as to exclude acute respiratory tract infections. Patients having marked degree of deviated nasal septum (grade 3 or 4) on anterior rhinoscopy and with extensive nasal polyposis were excluded from the study. However, those with accompanied asthma (13 patients) were included. Postsurgery patients using nasal saline were also excluded.

The patients were given a questionnaire and were asked to grade their symptoms like nasal obstruction, postnasal discharge, sneezing, need to blow, itch in eyes, lack of sleep at night, fatigue, ear fullness and running nose, on a scale from 0 to 3 with 0 indicating absence of symptoms and 3 indicating severe symptoms. After adding the scores, total

**Table 1:** Baseline characteristics of study groups

Characteristic	Group 1 (NSI +AAT) (53)	Group 2 (AAT) (47)
Age (average)	38.7 years	37.7 years
Sex		
Male	23 (43%)	22 (47%)
Female	30 (57%)	25 (53%)
Education		
Illiterate	9 (17%)	6 (13%)
Under graduate	29 (55%)	31 (66%)
Graduate	15 (28%)	10 (21%)
Smoking	10 (19%)	12 (25%)
Asthma	6 (11%)	7 (15%)

disability score of patient was calculated and its percentage was noted as PDS (percentage disability score). Patients were randomly divided into 2 groups. Group 1 received anti-allergic treatment along with nasal saline irrigation and group 2 received only anti-allergic treatment. Both the groups received same kind of anti-allergic treatment. However, in addition to anti-allergic treatment, group 1 patients were instructed to take nasal saline irrigation using isotonic saline twice a day before using nasal spray. Same questionnaire was filled at 2, 4, 6 and 8 weeks of treatment and the symptom score was compared with previous recordings. The collected data underwent statistical analysis by applying “t” test.

## OBSERVATIONS

The averages of PDS at the beginning of study were comparable in both the groups, i.e. 85% and 86%. Both study groups showed improvement in PDS after treatment at 2 weeks ( $p < 0.001$ , paired ‘t’ test). But, the PDS was much less in group 1 as compared with group 2 (Fig. 1) at the end of 2 weeks. This decrease in symptom score was more significant in group 1 as compared to group 2 at the end of 2nd week.

As evident from the chart, maximum reduction in PDS was seen at the end of 2nd week from 85 to 37% in group 1 and 86 to 52% in group 2. In both the groups same downward trend was seen in percentage disability score at 4th, 6th week though not to a significant extent. At 8 weeks, symptom score did not improve much in comparison with at 6 weeks in both the groups.

Among 2nd group, 43% (20) patients reported dryness of nasal cavity and throat most of the time during the daytime. However, only 30% (16) patients in group 1 reported dryness.

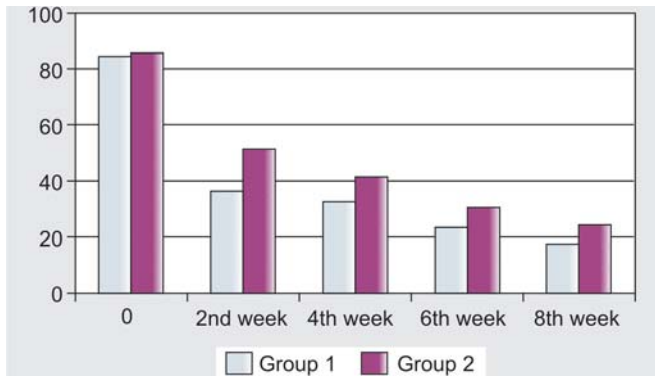
None of the patients reported any adverse effects in both the groups. However, 10 (19%) patients of group 1 found difficulty in doing NSI twice daily due to the time constraints. Still, they were able to manage NSI once a day and found significant improvement even with that.

## DISCUSSION

Healthy person’s respiratory tract is protected from airborne contagion and debris by a mucociliary layer<sup>1,2</sup> that lines the sinonasal cavity. This layer consists of columnar, ciliated epithelial cells and goblet cells bathed in mucus. Foreign particles are trapped in the sticky layer of mucus, and ciliary action propels the entire mucous layer out of the sinuses toward the nasopharynx. When this transport mechanism fails; rhinosinusitis occurs, usually in response to a virus, bacterium, irritant, or allergen.<sup>3</sup>

Inflammation of nasal mucosa is a common pathological feature in all types of CRS. One of the major targets in management of CRS is to keep the inflamed nasal cavities clean. Isotonic sodium chloride nasal lavage acts by fluidization<sup>4</sup> and facilitating the clearing of thick mucus and crusts in patients affected by chronic rhinosinusitis.<sup>5</sup> This simple procedure allows restoration of normal mucociliary function<sup>6,7</sup> and also washes the possible allergens.<sup>8-10</sup> In addition to this, it also helps by removal or reduction of inflammatory mediators such as histamines, prostaglandins, leukotrienes and eosinophils.<sup>11,12</sup> Saline irrigation prior to anti-allergic spray, prevents the drug from getting deposited on the crusts or discharge thereby preventing wastage and thus improving its efficacy. In our sample, group of patients using antiallergics with NSI had a significantly greater improvement than with anti-allergic alone. The results of present study are consistent with the findings of Garavello,<sup>13</sup> who found that nasal saline irrigation along with antihistamine resulted in significant improvement in symptom score as compared to antihistamine alone.

Saline irrigation has been used by many otolaryngologists for CRS. Variety of saline solutions are available commercially. Some of them are available as drops and some as sprays, both having various types of nozzles and different types of delivery systems. There are many studies comparing the various delivery systems, some advocating better results with sprays and others with irrigations.<sup>14</sup> Saline solution can be prepared at home using warm water and non-iodized salt and can be delivered using various syringes and irrigation pots.<sup>15</sup> Both hypertonic and isotonic saline have been documented in literature for nasal irrigation. We have used a 20 cc syringe with a soft rubber canula at its end, for irrigation of nose with isotonic saline.



**Fig. 1:** Comparison of average PDS at 2nd, 4th, 6th and 8th week among both groups

In one study, hypertonic saline has been found to be useful in treatment of allergic rhinitis, asthma and nasal polyposis in adult and pediatric subjects as an adjuvant to anti-allergic therapy.<sup>16</sup> But this effect is to be studied further and no significant effect on asthma was noticed by our patients among both the groups.

## CONCLUSION

Concomitant use of nasal saline irrigation along with anti-allergic treatment is safe, effective, inexpensive and well tolerated for chronic symptoms of allergic rhinosinusitis. NSI is an important component in the management of sino-nasal conditions which is very much underutilized. Whether use of nasal saline irrigation leads to any improvement in symptoms of URI induced asthma and polyposis needs to be evaluated.

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