

Critically Appraised Topic  
SALINE NASAL IRRIGATION AND SEASONAL ALLERGIC RHINITIS

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**Clinical Scenario:** A 10 year old female accompanied by her mother presents to clinic for her annual physical exam. She has a negative medical health history with the exception of seasonal allergies. Spring is just around the corner and her mother was inquiring if there is a non pharmaceutical treatment that she could use to prevent or relieve her daughter's occasional allergy rhinitis symptoms.

**Clinical Question:** In the pediatric population with seasonal allergic rhinitis, is nasal irrigation with normal or hypertonic saline an effective adjunct therapy in qualitatively reducing rhinitis symptoms in comparison to patients who use standard medical therapy (i.e. antihistamines) alone?

**Articles:**

Garavello, W.; Berardino, F.; Romagnoli, M.; Giuseppe, S.; and Gaini, R. (2005). Nasal rinsing with hypertonic solution: an adjunctive treatment for pediatric seasonal allergic rhinoconjunctivitis. *International Archives of Allergy and Immunology*. 137 (4): 310-314.

Li, H., Sha, Q., Zuo, K., Jiang, H., Cheng, L., Shi, J, and Xu, G. (2009). Nasal saline irrigation facilitates control of allergic rhinitis by topical steroid in children. *ORL Journal Otorhinolaryngol Related Specialties*, 71 (1): 50-5.

**Critical Review of Study/Summary of Key Evidence:**

A randomised control study was done by Garavello et al. (2005) providing grade A recommendation with level 1 of evidence. Li et al. (2009) also performed a randomised controlled study providing grade A recommendations with level 1 of evidence.

Twenty four children with allergic rhinitis (AR) were assigned into two groups in the Garavello et al. study with 22 children completing follow-up. The Li et al. study consisted of 26 children with AR divided into three groups (control group, saline irrigation and/or topical steroid) with the entire group completing follow-up.

The children in the Garavello et al. study received three times daily nasal irrigation with hypertonic saline during the pollen season which lasted 7 weeks and were compared with the control group who did not receive any nasal irrigation. They did not state the mean age of patients in their study. Patients were allowed to use oral antihistamines when required. In Li et al. study, patients with mean age of 11 years with persistent AR caused by house dust mites, grass pollens, and mold. The diagnosis of AR was confirmed by history, physical examination and skin prick test with a battery of common allergens. All patients presented with nasal edema and vicious secretions. The patients with marked septum deviation, prior nasal surgery, nasal polyposis and symptoms of infection were excluded. All patients received 10 mg loratadine tablet daily for 2 weeks in combination with other managements. Three randomized groups were studied: steroid only (n=6); saline only (n=8); and saline + steroid (n=12). The topical steroid was 256 mcg budesonide nasal sprays daily for 4 weeks, followed by 128 mcg and 64 mcg daily for 4 weeks. As for nasal saline irrigation, 500 ml of normal saline (0.9% sodium chloride solution) was used twice a day for nasal irrigation with commercial positive-pressure nasal irrigation applicator. Patients were analyzed in the groups to which they were randomized in both studies.

The Garavello et al. study collected a mean daily rhinoconjunctivitis score based on the presence of nasal discharge and obstructions as well as ocular symptoms (reddening and itching). These were calculated for each week of the pollen season along with the mean number of oral antihistamines taken per week. The Li et al. study measured nasal symptoms and signs (using a 4 point scale); mucociliary clearance (MCC-using saccharine method); and nasal secretions collected at clinic visits at weeks 2, 4, 8, and 12. Soluble intercellular adhesion molecules (sICAM-1) was measured in duplicate using commercially available ELISA kits and set according to the manufacturer's instructions. sICAM-1 measures adhesion molecules that reflect the presence of inflammation indicative in development of AR. The significance level of all the analyses was defined as  $p < 0.05$ .

The mean weekly rhinoconjunctivitis score in the active group was reduced during the whole pollen period in the Garavello et al. study. This difference was statistically significant in week 6 and 7 of therapy. A markedly reduced intake of oral antihistamines was also observed in patients allocated to nasal rinsing, being significant in week 6 and 7 of therapy. No adverse effect was reported in the active group. The Li et al. study showed significant improvement of symptoms and signs in patients after 3 months of administration. Compared with steroid alone and saline alone patients, significant differences in total scores of symptoms and signs were observed in steroid + saline patients at weeks 2, 4, 8, and 12. The mean values of MCC decreased in all patients after treatment. There was a significant difference between steroid alone and saline alone patients, as well as saline alone patients and steroid + saline patients. The mean concentrations of sICAM-1 in nasal secretions decreased in all patients after treatment. There were significant differences between steroid alone and steroid + saline patients, as well as saline alone and steroid + saline patients at weeks 8 and 12.

Aside from the experimental intervention, the groups were treated equally. Patients, health workers, and study personnel were not 'blinded' to treatment.

### **Clinical Bottom Line:**

According to these two studies saline nasal irrigation with either normal saline or hypertonic saline has been shown to be beneficial as an adjunct to therapy of allergic rhinitis.

Garavello et al. found that the mean daily rhinitis score was reduced and a decreased consumption of oral antihistamines was observed in children with seasonal AR after being treated with hypersaline nasal irrigation. Li et al. study has provided evidence that nasal saline irrigation (normal or hypertonic) is effective in controlling AR in combination with less steroid nasal spray than routine dosage.

The strengths of the studies included that both studies provided high level of evidence along with validity of diagnostic tools, randomization, limited bias and statistical analysis. The weaknesses of these studies were that each consisted of a small study sample. Opportunities for further study on the appraised topic could include the techniques of nasal irrigation. Does nasal irrigation and saline nasal sprays provide equal symptomatic relief? Threats of the appraised topic would include the techniques used and age of children in the study. Each study used nasal irrigation, but consistency of technique may be questionable.

Each of the studies supports the use of nasal irrigation as a safe adjunctive treatment in the pediatric population with seasonal allergic rhinitis symptoms. Providing evidence based treatment and education to our patients is relevant to our practice. Providing alternatives to pharmaceuticals has been proven to be beneficial in treatment of patient's symptoms with

allergic rhinitis, but it is also cost effective. Nasal saline irrigation can be quickly and successfully recommended in primary care settings.

#### References

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