



Topical management of chronic rhinosinusitis

Arun Kumar*

Department of ENT, ENT hospital, Hyderabad, India

*Corresponding author: Arun Kumar, Department of ENT, ENT hospital, Hyderabad, India,
E-mail: arun@gmail.com

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Abstract

Chronic rhinosinusitis (CRS) is an inflammatory condition involving nasal passages and therefore the paranasal sinuses for 12 weeks or longer. It are often subdivided into three types: CRS with nasal polyposis (CRS with NP), CRS without nasal polyposis (CRS without NP), and Allergic fungal rhinosinusitis (AFRS). To diagnose CRS we require a minimum of two of 4 of its cardinal signs/symptoms. Additionally, direct visualization or imaging for objective documentation of mucosal inflammation is required. CRS therapy is aimed to scale back its symptoms and improve quality of life because it can't be cured in most patients. Thus, the goals of its therapy include the following:

- Control mucosal edema and inflammation of nasal and paranasal sinuses
- Maintain adequate sinus ventilation and drainage
- Treat any infecting or colonizing micro-organisms, if present
- Reduce the amount of acute exacerbations

Introduction

Mucosal remodeling is that the presumably underlying mechanism causing irreversible chronic sinus disease, almost like that happens in severe asthma [1,2]. In patients with both disorders, medical treatment of CRS can help in asthma control. Multiple topical and systemic therapies are utilized in the management of CRS, including saline washes and sprays, intranasal and systemic glucocorticoids, anti-leukotriene agents, and antibiotics.

Topical therapies for chronic rhinosinusitis

Nasal Saline: Saline irrigations are wont to freshly clean the nasal mucosa as irrigating the nasal cavities with saline

removes secretions, decreases postnasal drainage, and washes away allergens and irritants. It is often used shortly before administering other intranasal medications. Counting on the severity of symptoms, nasal lavages are often used with variable frequency as required. Careful reviews of studies involving the utilization of saline sprays and irrigation found that monotherapy with nasal saline is a smaller amount effective than adjunctive treatment for CRS.

Surfactants: Surfactants are a category of compounds which demonstrate amphipathic properties, containing both hydrophobic and hydrophilic characteristics that allow the compound to be solvent in both water and organic substrates [3].

The surfactants, like baby shampoo, are believed to stop the bacterial biofilms formation on the sinus mucosa and increase mucociliary clearance. A study was done to research the consequences of baby shampoo (1% solution) in physiologic saline in 18 postsurgical patients, [4] with twice daily sinus irrigations for four weeks. 11 of these patients reported subjective thinning of mucus and improvement in postnasal drainage.

Topical Steroid: the idea behind budesonide use in irrigation is that higher concentrations of steroids are often topically delivered to sinus mucosa than what's available as a nasal steroid spray [5]. We've the subsequent recommendations to optimize the effectiveness of nasal sprays and improve patient compliance:

- It's convenient for patients to use preparations with once-daily dosing with improved compliance. These preparations include fluticasone propionate, fluticasone furoate, budesonide, triamcinolone acetonide, and mometasone furoate.
- Just in case of obvious mucus or crusting, the nose should be cleaned with nasal saline sprays or irrigation before applying the nasal glucocorticoid sprays.
- Position of the top while spraying should be slightly downward as tilting the top back can cause spillage of the medication to the throat. Additionally, the tip of the bottle should be directed laterally within the nostrils to attenuate septum irritation and bleeding.

Glucocorticoid solution of fluticasone propionate and betamethasone are commercially available as nasal drops within the UK and Europe. In the US, glucocorticoid solution of budesonide within the sort of nebulization is out there and may be utilized in the subsequent form. The “concentrated rinse” of budesonide is typically prepared by combining its one respule (0.5 mg in 2 mL) with 5 mL of saline making a mix with budesonide concentration of 71.4 micrograms/mL. Lesser concentrations also can be made by mixing half respule counting on what's believed best suited for the patient [6].

The nebulized solutions are effective in patients unable to perform nasal instillation thanks to problems with the technique. The efficacy and safety of nebulized solutions were evaluated during a randomized trial involving 60 patients having eosinophilic CRS with Nasal Polyps, treated with either a budesonide solution or placebo for 2 weeks. The results showed significant clinical improvement within the symptoms and size of the polyp. Morning plasma cortisol was measured at the top of the study to gauge for adrenal suppression, but there was no evidence of it [7]. It's noteworthy that this study used a better dose of budesonide solution (1 mg in each nostril daily). However, it had been not proposed to use this higher dose of nasal nebulization for chronic use.

Antibiotics: The role of both topical and systemic antimicrobials in CRS has been re-examined as CRS pathophysiology involves complex inflammatory changes rather than persistent bacterial infection. Evidence within the support of antimicrobials as monotherapy is of inferiority and limited. The most goal of managing CRS is to regulate the inflammation that predisposes to obstruction, ultimately minimizing the probabilities of infections [8]. Whenever feasible, purulent mucus should be obtained from middle meatus or another sinus ostium endoscopic ally for culture, which should determine the selection of appropriate antibiotic. Nasal swabs shouldn't be used for culture as they don't have sinus contents. If endoscopy isn't feasible antimicrobial agents should be chosen empirically except in following clinical settings:

- Failed antibiotic treatment with an identical regimen in recent past
- History of infection with methicillin-resistant *Staphylococcus aureus* (MRSA) or gram-negative or another highly drug-resistant bacteria
- The patient is very immunocompromised with increased risk for invasive fungal rhino sinusitis

Antifungal (Oral or intranasal): Allergic fungal rhino sinusitis (AFRS), a sort of CRS involves fungal colonization. Both systemic and topical antifungals (either amphotericin B or itraconazole) are studied in AFRS in a number of the clinical trials, with mostly unfavourable results [9]. A meta-analysis and a scientific review, involving antifungal therapy found no statistically significant advantage of systemic or intranasal antifungals over placebo, and better adverse events rates in patients with antifungal groups.

Fluticasone propionate may be a potent, topically active

corticosteroid, available as either an aqueous nasal spray or aqueous nasal drop preparation during a single dose. The drops preparation delivers more of the drug to the affected sinus mucosa [10].

Conclusion

Topical therapies are usually the primary line of treatment in most case of chronic rhino sinusitis (CRS). Most of the patients with CRS can't be cured, and therefore the goal of therapy is to supply symptomatic relief and improve quality of life. Multiple topical and systemic therapies are employed within the management of CRS, including intranasal saline, surfactants, glucocorticoids (intranasal and systemic), antibiotics, and antifungal agents. These medications are combined in various ways to manage CRS counting on the subtype and severity of clinical presentation.

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