

Editorial



What is the Optimal Method for Steroid Delivery in the Treatment of Chronic Rhinosinusitis With Nasal Polyps?

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► See the article “Comparison of Corticosteroids by 3 Approaches to the Treatment of Chronic Rhinosinusitis With Nasal Polyps” in volume 11 on page 482.

Chronic rhinosinusitis (CRS) is a prevalent heterogeneous inflammatory disorder of the sinonasal mucosa affecting up to 12.5% of the global population.¹ Clinically, CRS can be classified as either CRS without nasal polyp (CRSsNP) or CRS with nasal polyp (CRSwNP). Based on the tissue immunological profile, CRSwNP can be further divided into eosinophilic CRSwNP (ECRSwNP) and non-eosinophilic CRSwNP, which also exhibit different geographic and racial distributions.² Among the subtypes, ECRSwNP possess clinical significance due to its relatively severe disease expression, high rate of disease recurrence after surgery, and comorbid asthma.³ The refractory and recurrent conditions mainly come from the skewed type 2 inflammation with defective regulatory T-cell functions in ECRSwNP that have negative effects on many factors detrimental to sinus disease.^{4,5}

Steroids remain the mainstay treatment options in the management of type 2 inflammatory sinonasal disease and are considered a key component of medical therapy.⁶ The multifactorial anti-inflammatory effects along with the potent anti-remodeling effect of corticosteroids are the most important reasons for the widespread use in the treatment of CRSwNP.⁷ Pooled data analysis reveals that commonly used topical steroid sprays have benefits on symptoms, polyp size, polyp recurrence, and nasal airflow.² However, sometimes the therapeutic effects of topical steroid sprays are insufficient because of inadequate steroid delivery to the key regions. In this case, patients may require repeated systemic steroid treatment or/and sinus surgery in spite of the fact that even short courses of systemic steroid are associated with side effects, especially when required multiple times a year.⁸ Therefore, developing a more efficient modality for placing corticosteroid at the target sinonasal region and for reducing systemic absorptions of steroids can provide a potential improvement of medical treatment in CRS.

In the current issue of the *Allergy, Asthma and Immunology Research*, Zhang *et al.*⁹ provided an opportunity to gain greater insight into the route of corticosteroid administration, which presents the best balance between efficacy and safety. They demonstrated that treatment for 2 weeks with budesonide inhalation suspension (BIS) via nebulization, compared to budesonide nasal spray, significantly improved the major nasal symptoms and reduced the size of polyps during the perioperative period in patients with ECRSwNP. In addition, short-term application of BIS via nebulization showed no significant reduction in serum cortisol level or incidence of serious adverse events that occurred after oral corticosteroid treatment.

The local anti-inflammatory effects were proved by changes in immunological and tissue remodeling markers after BIS via nebulization. Although the treatment and evaluation were limited to short-term effects without considering the duration difference for reaching the optimal clinical effect between corticosteroid delivery methods, this study seems to be the first randomized study to quantify the relative effectiveness and safety of corticosteroid administered via the 3 different therapeutic routes.

Currently, there are other considerable ongoing studies to find out the optimal method of corticosteroid delivery to sinonasal mucosa in CRSwNP. There are various intranasal steroid delivery devices available to physicians now. Devices should deliver steroid beyond the nasal valve and above the inferior turbinate, reducing the mucosal inflammation and polyps to widen the key nasal regions obstructed.¹⁰ However, it is demonstrated that spray pump can deliver only less than 1% of nasally-sprayed corticosteroids to the paranasal sinuses, regardless of surgical status.¹¹ Recently, a new delivery method, exhalation delivery through a novel closed-palate mechanism was designed to deliver corticosteroid to targeted regions in patients with CRS. Exhalation creates an airtight seal of the soft palate, isolating the nose and transferring positive pressure into the nose and sinuses to improve delivery of the topical corticosteroid while producing substantially lower systemic exposure than nasal spray.¹² These new therapeutic methods may contribute to patient satisfaction and improvement in treatment outcomes compared to conventional methods.

In summary, as current international guidelines recommend steroid therapy as the core of medical treatment for CRSwNPs, attempts have been made to achieve higher topical concentrations of corticosteroids in the sinus and to minimize systemic side effects. Short-term use of BIS nebulization can be another safe and effective route for corticosteroid administration. Further investigations on the long-term clinical and biological effects of steroid delivery are warranted.

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