

Therapeutic Class Overview

Intranasal Corticosteroids

Therapeutic Class

Overview/Summary: Intranasal corticosteroids are primarily used to treat perennial and seasonal allergic rhinitis and may be useful in the treatment of some forms of nonallergic rhinitis.¹⁻¹⁴ Symptoms associated with allergic rhinitis include nasal congestion, rhinorrhea, sneezing and/or nasal itching. These symptoms result from a complex allergen driven mucosal inflammation caused by resident and infiltrating inflammatory cells and a number of vasoactive and proinflammatory mediators.¹⁻² Intranasal corticosteroids downregulate the inflammatory response by binding to the intracellular glucocorticoid receptors of inflammatory cells and causing a conformational change, thereby controlling the rate of protein synthesis and suppressing the transcription of cytokine and chemokine genes.¹⁻²

All intranasal corticosteroids are approved by the Food and Drug Administration (FDA) for the treatment of perennial and seasonal allergic rhinitis.³⁻¹⁴ Mometasone (Nasonex[®]) carries an additional indication for the prophylaxis of seasonal allergic rhinitis.¹² Two currently available intranasal corticosteroids, beclomethasone (Beconase AQ[®]) and mometasone, are also FDA-approved for the management of nasal polyps.^{4,12} Nasal polyposis is an inflammatory condition of the nasal and sinus mucosa and usually presents as persistent nasal obstruction.¹⁻² Beclomethasone is principally used to prevent recurrence of nasal polyps following surgical removal.¹⁻²

Beclomethasone and fluticasone propionate are approved for the management of nonallergic rhinitis (e.g., infectious rhinitis, hormonal rhinitis and vasomotor nonallergic rhinitis with eosinophilia syndrome).^{4,11} Unlike allergic rhinitis, nonallergic rhinitis is characterized by periodic or perennial symptoms that are not a result of immunoglobulin E-dependent events.¹⁻²

Budesonide, flunisolide, fluticasone propionate, mometasone and triamcinolone are currently available generically. Beclomethasone (QNASL[®]) and ciclesonide (Zetonna[®]), were approved in 2012 and are the only two intranasal corticosteroid products formulated as a “dry” nasal aerosol; all other products in within the class are formulated as aqueous suspensions.³⁻¹⁴ Fluticasone furoate (Veramyst[®]), mometasone and triamcinolone are approved for use in children two years of age and older.¹⁰⁻¹⁴

According to the current clinical guidelines on the management of rhinitis, treatment should consist of patient education, allergen avoidance activities and pharmacological therapies. Patients should be educated on how to avoid known triggers, such as aeroallergens, dust mites, molds and irritants whenever possible. In addition to environmental control measures, pharmacological therapies may be used to control symptoms. Intranasal corticosteroids should be considered first-line therapy in patients with moderate to severe allergic rhinitis.¹⁵⁻¹⁷ While differences in potencies, lipid solubility and systemic bioavailability exist between the older and newer intranasal corticosteroid products, no single agent has consistently has been demonstrated to be more effective than another.¹⁷ Moreover, no one intranasal corticosteroid product is recommended over another as initial treatment in patients with perennial or seasonal allergic rhinitis.¹⁵⁻¹⁷

Table 1. Current Medications Available in the Therapeutic Class³⁻¹⁴

Generic (Trade Name)	Food and Drug Administration-Approved Indications	Dosage Form/Strength	Generic Availability
Beclomethasone (Beconase AQ [®] , QNASL [®])	Treatment of seasonal and perennial allergic rhinitis, nonallergic rhinitis†, and nasal polyps†	Aerosol for nasal inhalation: 40 µg/actuation 80 µg/actuation (120 actuations) Suspension for nasal inhalation: 42 µg/inhalation (180	-

Generic (Trade Name)	Food and Drug Administration-Approved Indications	Dosage Form/Strength	Generic Availability
		metered doses)	
Budesonide (Rhinocort Aqua®*)	Treatment of seasonal and perennial allergic rhinitis	Suspension for nasal inhalation: 32 µg/inhalation (120 metered doses)	✓
Ciclesonide (Omnaris®)	Treatment of seasonal and perennial allergic rhinitis	Aerosol for nasal inhalation: 37 µg/actuation (60 actuations) Suspension for nasal inhalation: 50 µg/inhalation (120 metered doses)	-
Flunisolide	Treatment of seasonal and perennial allergic rhinitis	Solution for nasal inhalation: 0.025% (200 metered doses) Suspension for nasal inhalation: 29 µg/inhalation (200 metered doses)	✓
Fluticasone furoate (Veramyst®)	Treatment of seasonal and perennial allergic rhinitis	Suspension for nasal inhalation: 27.5 µg/inhalation (120 metered doses)	-
Fluticasone propionate	Treatment of seasonal and perennial allergic rhinitis and nonallergic rhinitis	Suspension for nasal inhalation: 50 µg/inhalation (120 metered sprays)	✓
Mometasone (Nasonex®*)	Treatment of seasonal and perennial allergic rhinitis, nasal polyps and prophylaxis of seasonal allergic rhinitis	Suspension for nasal inhalation: 50 µg/inhalation (120 metered doses)	✓
Triamcinolone	Treatment of seasonal and perennial allergic rhinitis	Suspension for nasal inhalation: 55 µg/inhalation (120 metered doses)	✓

*Generic available in one dosage form or strength.

†Beconase AQ only.

Evidence-based Medicine

- Clinical trials have demonstrated the safety and efficacy of the intranasal corticosteroids for their respective Food and Drug Administration-approved indications.¹⁸⁻⁹⁰
- Daily administration of intranasal corticosteroids is associated with statistically significant improvements in allergy-related total nasal symptom scores (TNSS), health related quality of life scores and minimal adverse events. Furthermore, numerous head-to-head clinical trials comparing the available intranasal corticosteroids have generally demonstrated no significant clinical differences

among the currently available intranasal corticosteroids with regard to efficacy.^{48,62,64-85} Some studies have reported differences in sensory perceptions and patient preference with one agent compared to another.^{49,57,64,65,79,80,82,85} Patients administering the agents noted differences in odor, aftertaste, and severity of irritation, though these differences were not associated with differences in efficacy between the agents.

- Head-to-head trials evaluating the efficacy and safety of beclomethasone, fluticasone propionate and flunisolide demonstrate that these agents are comparable to other agents within the class.^{58,60-62,64,65,68-71,77,82-84} However, additional results of these studies reinforce that all of the intranasal corticosteroids should be considered equally efficacious.
- To date, the newly approved intranasal corticosteroid aerosol formulations have been demonstrated to be significantly more effective compared to placebo. In a six-week study of patients with perennial allergic rhinitis, aerosolized beclomethasone significantly improved reflective TNSS compared to placebo (-2.46 vs -1.63; $P < 0.001$). Furthermore, beclomethasone was associated with a statistically significant improvement in quality of life compared to placebo ($P = 0.001$).¹⁸ The aerosolized ciclesonide formulation has also been shown to significantly improve symptoms of allergic rhinitis compared to placebo. In a study by Ratner et al, ciclesonide administered at a daily dose of 80 µg or 160 µg reduced reflective TNSS by 15.1 and 16.0%, respectively, compared to 3.7% in the placebo group ($P < 0.001$ for both). In addition, significant improvements were observed with both doses of ciclesonide compared to placebo with regard to ocular symptoms scores and quality of life ($P < 0.001$ for both).²⁵ Similar improvements in outcomes were reported in additional studies of up to 26 weeks duration.²⁶⁻²⁹

Key Points within the Medication Class

- According to Current Clinical Guidelines:¹⁵⁻¹⁷
 - According to the current clinical guidelines on the management of rhinitis, treatment should consist of patient education, allergen avoidance activities and pharmacological therapies.
 - Patients should be educated on how to avoid known triggers, such as aeroallergens, dust mites, molds and irritants whenever possible. In addition to environmental control measures, pharmacological therapies may be used to control symptoms. Intranasal corticosteroids should be considered first-line therapy in patients with moderate to severe allergic rhinitis.
 - While differences in potencies, lipid solubility and systemic bioavailability exist between the older and newer intranasal corticosteroid products, no single agent has consistently has been demonstrated to be more effective than another.
 - Moreover, no one intranasal corticosteroid product is recommended over another as initial treatment in patients with perennial or seasonal allergic rhinitis.
- Other Key Facts:
 - The role of the intranasal corticosteroids in the treatment of allergic rhinitis has been well established.
 - Budesonide, flunisolide, fluticasone propionate, mometasone and triamcinolone are currently available generically.
 - Two “dry” nasal aerosol products, beclomethasone (QNASL[®]) and ciclesonide (Zetonna[®]), were approved in 2012. All other agents within the class are aqueous suspensions.

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