

Efficacy of Budesonide Nasal Administration in the Management of Chronic Rhinosinusitis: Meta-Analysis of Randomized Clinical Trials

Omais Al Hussain, MD*

ABSTRACT

Background: Chronic rhinosinusitis (CRS) is a common and debilitating condition characterized by persistent nasal inflammation, leading to significant impairments in quality of life. Due to its anti-inflammatory properties, budesonide, a nasally administered corticosteroid, has emerged as a promising therapeutic option. This meta-analysis aims to critically evaluate the efficacy of budesonide in the management of CRS.

Methods: This meta-analysis adhered to PRISMA guidelines, including randomized controlled trials (RCTs) involving adult patients with CRS treated with budesonide via various nasal routes. Primary outcomes were assessed using the Sino-Nasal Outcome Test (SNOT-22) or equivalent quality-of-life measures. A comprehensive literature search was conducted across multiple databases up to September 2024, using specified keywords to identify English-language articles. Two independent researchers screened the articles for inclusion, extracted data on study characteristics and participant demographics, and performed a quality assessment using the Cochrane Risk of Bias Tool. Statistical analysis was conducted using R software version 4.2.2, calculating standardized mean differences (SMD) with 95% confidence intervals (CI). Heterogeneity was assessed via the Cochrane Q test and I^2 statistic, applying random-effects models as needed.

Results: The search yielded 224 citations, of which 7 RCTs met the inclusion criteria, encompassing a total of 286 participants. Budesonide nasal administration resulted in a significant improvement in SNOT-22 scores (SMD -1.12, 95% CI: -1.90 to -0.34, $p = 0.013$), indicating substantial clinical benefits. High heterogeneity ($I^2 = 76.2\%$) was observed among studies, suggesting considerable variability in treatment responses.

Conclusion: Budesonide nasal administration is an effective intervention for alleviating symptoms of CRS, with specific delivery methods leading to enhanced therapeutic outcomes. Future research should focus on understanding the factors influencing variability in treatment responses to further refine therapeutic strategies.

Keywords: Budesonide, Chronic Rhinosinusitis, Nasal Administration, Meta-Analysis

Bahrain Med Bull 2025; 47 (2): 2896 - 2903

* Otolaryngology, Head & Neck Surgery Department, College of Medicine
Imam Mohammad Ibn Saud Islamic University (IMSIU), Riyadh, Saudi Arabia.
E-mail: OHALHUSSAIN@imamu.edu.sa