MINI-REVIEW

Use of biological drugs in the treatment of bronchial asthma: a review study by meta-analysis

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Received: May 10, 2024, **Accepted:** July 20, 2024, **Published:** July 23, 2024

Keywords: Asthma, biological drugs, conventional treatments

Bronchial asthma is a chronic respiratory disease characterized by airway inflammation and hyperresponsiveness. Despite the availability of conventional therapies, a subset of patients with severe asthma remains uncontrolled and experiences frequent exacerbations. In recent years, the emergence of biological drugs has revolutionized the management of severe asthma by targeting specific inflammatory pathways. This study aims to provide an overview of the use of biologic drugs in patients with bronchial asthma. Subsequently, it explores the efficacy of different biologic agents, including monoclonal antibodies targeting immunoglobulin E (IgE), interleukin-5 (IL-5), and IL-4/IL-13 pathways. Furthermore, this review examines the clinical evidence supporting the use of biologic drugs in treating of severe asthma. This study was done to provide: The biological drugs approved by the FDA in the treatment of bronchial Asthma**,** The efficacy of some biological drugs in the treatment of bronchial asthma and the safety profile of these drugs. This study is a review of articles done by meta-analysis within the last ten years from 2013 to 2023 concerning the use of biological drugs in the treatment of bronchial asthma.

Figure 1: Biological drugs that are approved by the FDA for the treatment of bronchial asthma

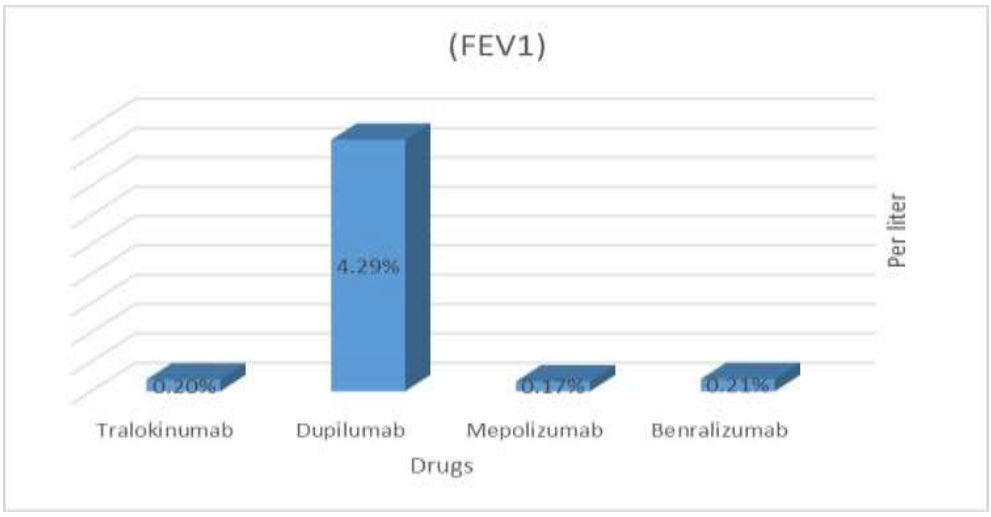


Figure 2: Improvement forced expiratory volume (FEV1)

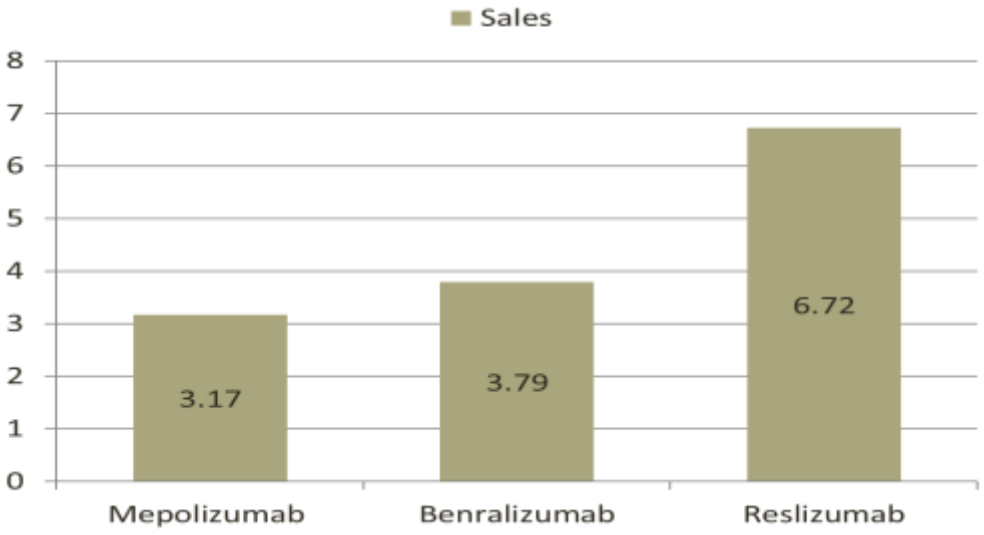


Figure 3: Improvement exacerbation rate reduction (ERR)

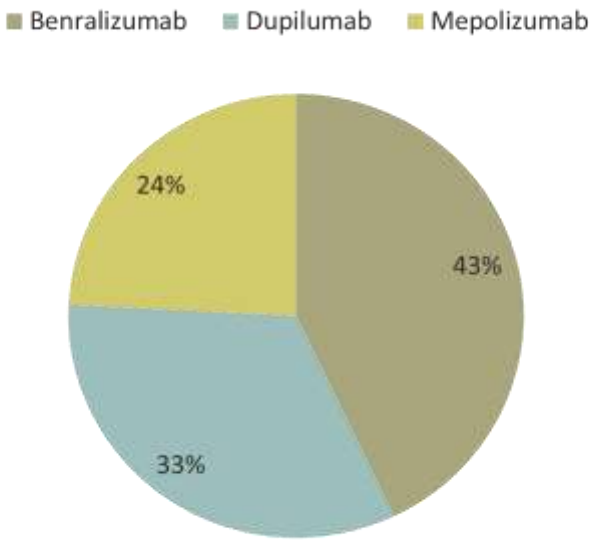


Figure 4: Most of biological drugs cause

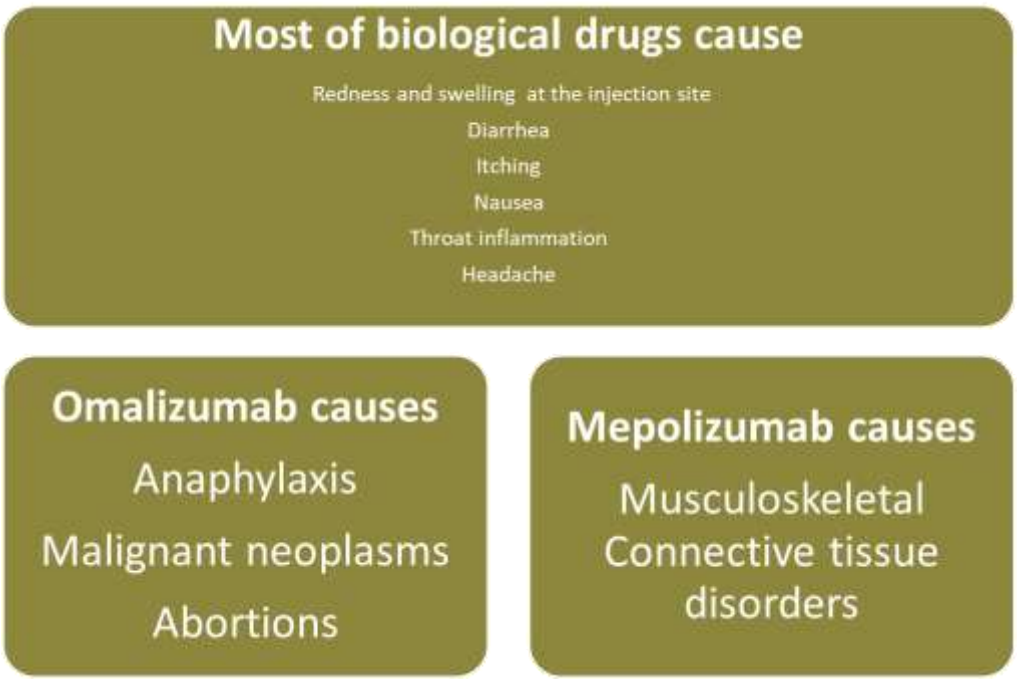


Figure 5: The safety profile of the biological drugs

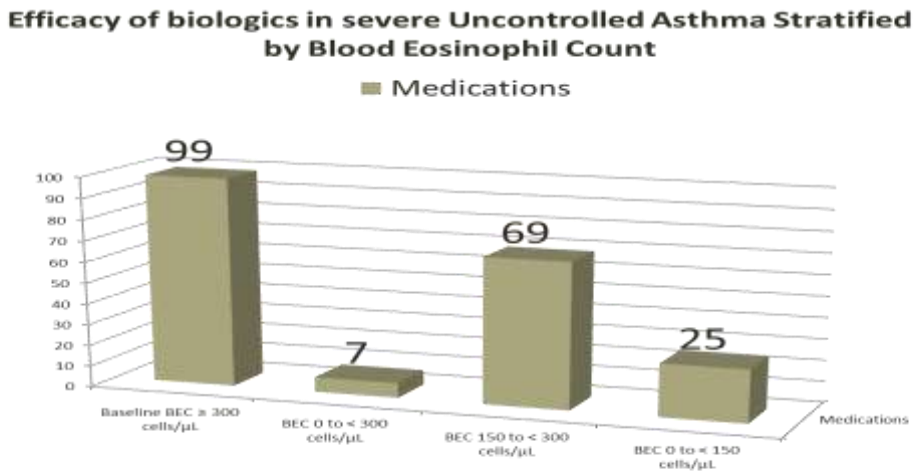
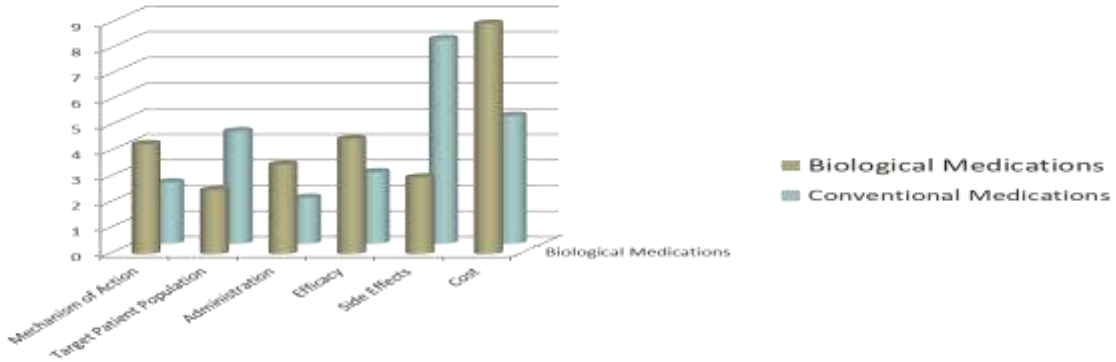


Figure 6: Comparison between biological and conventional medications



Biological drugs, such as omalizumab, Mepolizumab, Reslizumab, Benralizumab, Dupilumab, and Tezepelumab, Tralokinomab, have been approved by the FDA for the treatment of severe asthma in patients who do not respond well to conventional treatments. These biological drugs have shown efficacy in improving asthma control, reducing symptoms, and decreasing asthma exacerbations. Different studies have demonstrated the effectiveness of specific biological drugs in reducing asthma exacerbations, improving symptom control, and reducing the need for oral corticosteroids. The effectiveness of biologics may vary depending on the baseline blood eosinophil count (BEC) of patients. Higher BEC levels tend to show better response to biologics in reducing exacerbations. Benralizumab, in particular, has been found to inhibit eosinophil differentiation and infiltration in the airways, leading to improved asthma control and a reduction in exacerbations. Reslizumab has shown significant improvements in asthma control and quality of life compared to benralizumab. Tezepelumab has demonstrated a significant reduction in asthma exacerbations, regardless of the blood eosinophil count. Dupilumab has shown promise in the treatment of asthma, with improvements in lung function and asthma control. Biologic therapies have generally been found to be safe, with common side effects such as soreness at the injection site, headache, sore throat, and fatigue. However, there may be a small risk of anaphylaxis or certain infections with some biologics. The use of biologics in asthma treatment may incur higher costs compared to other control medications, and patients should discuss the cost and coverage with their doctor. Current pricing for biologics may need to be reduced significantly to meet measures of cost-effectiveness. These conclusions highlight the efficacy, safety, and varying effectiveness of different biological drugs in the management of severe asthma, providing valuable insights for healthcare professionals and patients making treatment decisions.

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Author contributions: Both authors have contributed equally.

Conflict of interest: The authors declare the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Ethical issues: Including plagiarism, informed consent, data fabrication or falsification, and double publication or submission were completely observed by the authors.

Article cite: Hashad NS and Mohammed ZF (2024) Use of biological drugs in the treatment of bronchial asthma: a review study by meta-analysis. Mediterr J Med Res. 4: 1-5. https://doi.org/10.5281/zenodo.12802789