



## Evaluating the Effectiveness of Ohtuvayre Regimen Over Albuterol in COPD Management

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### ABSTRACT

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One of the main causes of morbidity and poor health worldwide is Chronic Obstructive Pulmonary Disease (COPD) (World Health Organisation, 2024.). Over the last two decades, inhalation treatments had not advanced very much. Still, the U.S. Food and Drug Administration (FDA)'s recent approval of Ohtuvayre (ensifentrine) has brought a first-in-class inhalation medication combining bronchodilator and anti-inflammatory properties via dual inhibition of phosphodiesterase enzymes PDE3 and PDE4. Many trials have confirmed the usage of the new medicine by showing considerable increases in forced expiratory volume in one second (FEV1), therefore improving lung function. The Fatima et al. (2025) study indicates that patients reported to have greater quality of life (QoL), which was evaluated using the St. George's Respiratory Questionnaire-C, and less dyspnea, measured by the Transition Dyspnea Index. While this drug is also proven not to cause notable rise in adverse events compared to placebo, other studies also revealed that it offers a good safety profile. These results, indeed, indicate Ohtuvayre as a possible transforming COPD treatment. These days, providers have a better solution for controlling symptoms and improving patient outcomes. Patients who have been poorly controlled by current bronchodilators and inhaled corticosteroids would especially benefit from this medicine. That said, this study investigates elements including the mechanism of action, clinical efficacy, safety profile, and relative benefits of Ohtuvayre over current COPD medications.

### KEYWORDS:

Chronic Obstructive Pulmonary Disease (COPD), Ohtuvayre, Bronchodilation, Antiinflammatory Therapy, Ensifentrine, FDA-Approved COPD Treatment, Safety Profile, Lung Function Improvement, Forced Expiratory Volume in One Second (FEV1), Novel COPD Medications

### 1. INTRODUCTION

COPD is a progressive respiratory condition that manifests with persistent airflow limitation and chronic inflammatory responses in the airways and lungs. Studies such as Khan et al. (2023) have highlighted numerous treatments for COPD. However, a high prevalent of patients still suffer from debilitating symptoms and frequent exacerbations. Nevertheless, there has been a significant milestone in the development of a more efficient drug; Ohtuvayre. This medication best work for patients who have been inadequately controlled by existing therapies. In the past, therapies have included bronchodilators and inhaled corticosteroids, which often provided incomplete symptom relief, posing risks such as steroid-related

complications. Ensifentrine, on the other hand, as studies highlight have demonstrated significant improvements in lung function, dyspnea reduction, and QoL.

### 2. MECHANISM OF ACTION

Ensifentrine comes with a unique mechanism that differentiates it from traditional COPD treatments. Fatima et al. (2025) study states that ohtuvayre's active ingredient, ensifentrine, is a selective dual inhibitor of PDE3 and PDE4 enzymes. This means that unlike traditional therapies which target either bronchodilation or inflammation, ensifentrine works by inhibiting PDE3 enzymes leading to increased cyclic adenosine monophosphate (cAMP) levels in airway smooth muscle cells, thereby, resulting in bronchodilation. Concurrently, another study states that the drug work by inhibiting PDE4 enzymes, resulting in elevation of cAMP within inflammatory cells, thus, exerting anti-inflammatory effects (Anzueto et al., 2023). Through this dual action, the

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medication is able to address the central components in COPD pathophysiology. Fatima et al.

(2025) study highlights the capacity of ensifentrine in improving FEV1 and dyspnea scores.

Furthermore, ohtuvayre is administered through inhalation via nebulization which ensures effective drug deposition. This, in turn, makes the drug accessible for severely affected individuals including those with severe airflow limitations.

### **3. CLINICAL EFFICACY**

Findings from a study such as the Fatima et al. (2025) meta-analysis found that ohtuvayre's efficacy was consistent across different COPD severity levels, making it a versatile option for patients challenged by symptom control. The FDA's approval of ohtuvayre is well supported by data from the Phase 3 ENHANCE trials, which evaluated its efficacy as a maintenance treatment for COPD. In essence, these studies, demonstrated ohtuvayre to cause significant improvements in lung function, as measured by FEV1, both as a monotherapy and when added to existing maintenance treatments. Patients in other studies have also reported reductions in daily symptoms, including breathlessness and chronic cough, as well as enhanced quality of life (Wright et al., 2024).

### **4. SAFETY PROFILE AND SIDE EFFECTS**

Ohtuvayre is stated to be well-tolerated in clinical trials. The Wright et al. (2024) study reports no significant increase in treatment-emergent adverse events compared to placebo. The Fatima et al. study also highlighted that serious adverse reactions are rare, with most side effects being mild to moderate in severity. Some common adverse reactions include back pain, urinary tract infection, hypertension, and diarrhea. To take note, there has been warnings and precautions linked to ohtuvayre. These have included the risk of paradoxical bronchospasm as well as an increase in psychiatric adverse reactions (Marino et al., 2025). Healthcare providers are encouraged to screen and monitor patients with a history of mental health conditions closely. This way, address the adverse effects. An important point to note is that, unlike inhaled corticosteroids, ohtuvayre does not place a heightened risk of pneumonia to patients, making it a better alternative for patients prone to infections. More so, its non-steroidal mechanism reduces the risk of osteoporosis and other steroid-related complications in highly prone patients.

### **5. COMPARING ADVANTAGES OVER EXISTING COPD MEDICATIONS**

Existing COPD remedies have included bronchodilators, like long-acting beta-agonists (LABAs) and long-acting muscarinic antagonists (LAMAs). These are often combined with inhaled corticosteroids (ICS) to manage inflammation in COPD. Studies have highlighted that these medications offer limited efficacy as they fail to fully address the inflammatory processes in all COPD phenotypes (Skolnik

et al., 2023). They also have heightened risks linked to prolonged steroid use, including pneumonia and osteoporosis. On the other hand, one notes the high efficacy in ohtuvayre treatment compared to the latter. Firstly, the new drug includes a nonsteroidal anti-inflammatory mechanism, which is an advantage, especially in individuals who are at risk for steroid-related adverse effects. More so, its dual action offers complete symptom relief and simplifies treatment regimens by minimizing the need for multiple inhalers. This, in turn, improves patient adherence and outcomes. Most significantly, ohtuvayre is administered via a standard jet nebulizer, ensuring effective drug deposition. This, also makes it accessible for severely affected patients including those with severe airflow limitations.

### **6. INSIGHTS FROM VARIOUS STUDIES**

This review paper utilized the findings of a few studies such as the systematic and metaanalysis by Fatima et al. (2025) study and others. These studies evaluated the efficacy and safety of ensifentrine in COPD management, revealing that the particular drug was found to significantly improve lung function and reduce symptom burden in COPD patients. Additionally, studies highlighted that ensifentrine is highly safe, and states of its low incidence of serious adverse events (Wright et al., 2024).

### **7. NURSING IMPLICATIONS AND EDUCATION**

Nursing practitioners have a crucial role to play in ensuring that they deliver ensifentrine medication safely and effectively. This means that they must assess patients baseline respiratory function, comorbid health issues, and ensure that patients do not have a history of psychiatric disorders before medication administration. As noted, regular monitoring of lung function, including signs of paradoxical bronchospasm as well as symptoms is of essence to improve clinical outcomes. The findings of this review also call for nurses to educate patients about potential side effects in relation to ensifentrine, particularly hypertension, UTIs, and psychiatric reactions. In turn, this should ensure timely reporting of any concerning symptoms. More so, they should advise patients on the significance of reporting any signs such as worsening loss of breath or new psychiatric symptoms. Additionally, they should teach about adherence to nebulization instructions and emphasize routine follow-ups. This way, optimize treatment efficacy and minimize complications. Last but not least, lifestyle modifications such as smoking cessation must be emphasized to enhance patients' overall wellbeing.

### **8. CONCLUSION**

From this review, one can conclude that the approval of Ohtuvayre by the FDA showcases a significant advancement in COPD therapy. This is given its capacity to address both bronchoconstriction and inflammation without the use of steroids. In essence, its dual action provides

patients with complete symptom control and the potential to improve patient health outcomes and QoL. That said, ohtuvayre is a promising option for patients looking for a welltolerated maintenance COPD treatment. However, there is still a need for ongoing monitoring and research on this new drug to determine its long-term efficacy and safety in a broader patient population.

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