

Research Article

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Role of Mepolizumab in COVID Patients with Severe Eosinophilic Asthma

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ABSTRACT

Aim: To evaluate the effect of Mepolizumab on COVID-19 patients with severe eosinophilic asthma and other comorbidities.

Methods: 11 patients on Mepolizumab to treat SEA and contracted COVID-19 were taken. The retrospective clinical, demographical, and biochemical data were collected and evaluated.

Results: Out of the 11 patients infected with COVID-19, 6 were males and 5 were females, with a mean age of 58. The most common risk factor was Hypertension (54%), Diabetes (36%), Obstructive sleep apnea (36%), and coronary artery disease (27%). Four out of 11 are above the age of 60, and half of the patients were overweight. Despite having multiple comorbidities, none of the patients required admission to the hospital.

Conclusions: Patients who were administered mepolizumab and were diagnosed with COVID-19 only experienced mild symptoms and did not suffer from any complications despite having multiple comorbidities. This suggests that there may be a positive effect of mepolizumab on the course of COVID-19 or that it could be associated with asthma. However, further, larger-scale studies are required to determine the role of mepolizumab in COVID-19 and to explore its potential as a protective effect against the disease.

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Introduction

Since the outbreak of COVID-19, it has been responsible for millions of deaths and continues to cause mortality and morbidity throughout the globe. The presence of comorbidities such as diabetes mellitus, cardiovascular disease, or hypertension is associated with more severe complications and a higher case fatality rate in COVID-19 [1-3]. However, asthma has not been identified as an important risk factor for COVID-19 [3-4].

COVID-19 patients with eosinophilia have a lower incidence of complications and is associated with a better prognosis [5]. Thus, the peripheral blood eosinophil count could be considered a possible biomarker for evaluation and prognosis [6]. The role of biologics has been established in Severe Eosinophilic Asthma

(SEA). Still, concern has been expressed as eosinopenia due to treatment may be a risk factor for worse disease outcomes [7,8].

Different reports noted that treatment with benralizumab, dupilumab, and omalizumab is not associated with a significant negative impact during active COVID-19 infection in severe asthma [9-11]. The expert recommendation is to continue biologic therapy unchanged in SEA [12,13]. The data on mepolizumab and its effect on COVID-19 is very limited; hence, we present a case series of 11 SEA patients on mepolizumab who encountered COVID-19 and their outcomes.

The emergence of the Delta variant of COVID-19 was detected, resulting in a declaration of public health emergency due to its rapid transmission. In order to combat the virus, hospitals implemented standard operating procedures, as recommended by the Indian Council of Medical Research (ICMR) and the World

Health Organization (WHO), for emergency measures against all COVID-19 variants [14].

The study’s primary goal is to evaluate the effect of Mepolizumab on COVID-19 patients with SEA, although some patients co-exist with other comorbidities. A total of 11 patients who were on mepolizumab to treat SEA and contacted COVID-19 were taken. Their clinical, demographical, and biochemical data were collected retrospectively.

Materials and Methods

A total of 11 patients who were being treated with mepolizumab for SEA and diagnosed with COVID-19 caused by the Delta strain were included in the study conducted between April 2020 and April 2021. contracted COVID-19 were included in the study. The group consisted of 6 males and 5 females. The patients were managed according to the guidelines issued by the ICMR for individuals with comorbidities and those at high risk of developing severe COVID-19 [15].

Results

The study included 6 males and 5 females, with mean age of (58.27±12.44). Four out of 11 were above the age of 60, and half of the patients were overweight. Hypertension was the most common risk factor (54.54%), followed by Type 2 diabetes (36.36%), Obstructive sleep apnea (36.36%), and coronary artery disease (27.27%) (as shown in Table 1).

Table 1: Multiple Comorbidities Infected with COVID-19 Patient did not Require Hospitalization on Mepolizumab

Number of Patients N(%)	11(100%)
Age, years (Mean, SD)	58.27±12.44
Age group	
Less than 40 (N)	0
40-50 (N)	4
51-60 (N)	3
61-70 (N)	1
71-80 (N)	3
Sex (N%)	Male 6(54.55%)
	Female 5(45.55)
Body mass index, kg/m2 (Mean, SD)	6.0±7.49
COVID-19 infection	
Patients with covid exposure COVID-19 (N%)	10(90.90%)
Low or No impact of COVID-19 (N%)	1(9.10%)
Comorbidities	
Coronary artery disease, (N%)	3(27.27%)
Type 2 diabetes, (N%)	4(36.36%)
Hypertension, (N%)	6(54.54%)
Chronic obstructive pulmonary disease, (N%)	1(9.10)
Obstructive sleep apnea, (N%)	4(36.36)
Uveitis (N%)	0
Interstitial lung disease (N%)	1
Connective Tissue Disorder (N%)	0
Hypothyroidism (N%)	2(18.18)

All the patients were infected with COVID-19, SEA, and even with multiple comorbidities (Table 2); they did not require admission to the hospital.

Table 2: Mepolizumab Works in Severe Eosinophilic Asthma along with Nasal Vocal Cords Polyp

Number of Patients	11(100%)
Number of patients with severe Eosinophilic asthma (N%)	8 (72.72%)
Number of patients with Severe Allergic Asthma on Biologicals (N%)	2 (18.18%)
Number of patients with Severe Refractory Eosinophilic Asthma (N%)	1 (9.10%)
Category	
Severe Eosinophilic Asthma with Vocal Cord POLYP (N%)	1 (12.5%)
Severe Eosinophilic Asthma with Nasal Cord Polyp (N%)	2 (25.0%)
Severe Allergic Asthma on biologicals with Vocal Cord Polyp (N%)	1 (50.0%)
Severe Allergic Asthma on biologicals with Nasal Cord Polyp (N%)	1 (50.0%)
Refractory Eosinophilic Asthma with Vocal Cord Polyp (N%)	-
Refractory Eosinophilic Asthma with Nasal Cord Polyp (N%)	-

Discussion

In our paper, we present a series of patients who had COVID-19 while receiving mepolizumab for treatment of SEA. Our patients had various risk factors, such as Type 2 diabetes, coronary artery disease, hypertension, and obstructive sleep apnea, which are associated with worse clinical outcomes in COVID-19. In accordance with WHO and ICMR guidelines, patients over the age of 58 years are susceptible to severe infection and mortality and are advisable for hospitalization. Further, all the patients in the study group also co-exist with different comorbidities. Thus, the patients needed continuous monitoring and specialized medical care. The fact that none of our patients required admission due to COVID-19 despite multiple comorbidities suggests asthma or the drugs used may have had a protective role in the course of COVID.

A study conducted in Chicago showed that the risk of death in asthmatic patients is similar to that of non-asthmatic individuals who have no other risk factors [16]. Patients who have Th2-asthma phenotype, which is characterized by high levels of peripheral eosinophils (more than 150 cells/ml), are less likely to be admitted to the hospital and also have a lower mortality rate [17].

The use of biologics in patients of SEA has been well established, but their effects on COVID-19 patients are limited. Biologics can modulate, decrease, or deplete circulating eosinophils and thus should be detrimental to COVID-19 patients. Still, their use has been associated with positive outcomes and decreased hospital admissions. In a review article of around 98 patients of SEA on biologics, only one mortality was seen, attributed to patient age and multiple comorbidities [18]. Some cases reported a milder course of COVID-19 in patients with severe asthma on biologic

drugs, indicating the possibility of some unknown mechanisms of asthma or drugs used in asthma that positively affect the course of COVID-19 [9-11,19]. A case series's fundamental goal must be to develop hypotheses that can be evaluated in studies with more methodological precision. A case series is a screening tool for probable hypotheses needing further investigation. Case series are designed to be descriptive; descriptive statistics can be employed primarily. Hence, various confounding factors are not considered for comparative statistical analysis and interpretation [20].

Our study concluded that patients undergoing treatment with mepolizumab and contracted COVID-19 had a mild form of the disease and did not experience any complications, even though they had multiple comorbidities and severe chronic diseases at the time of the infection. The patients did not develop a secondary infection, and it is possible that treatment with mepolizumab could have played a role in preventing the severity or mortality of COVID-19. This could be associated with the positive effect of mepolizumab on COVID-19 or its potential use in treating asthma. However, larger prospective studies are needed to determine the precise role of Mepolizumab in COVID-19 and to explore the potential protective effects of the disease.

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