

Original Article

The Relationship of COVID-19 with Severe Asthma Patients Treated with Biologics

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ABSTRACT

Objective: To evaluate the relationship of COVID-19 with severe asthma patients treated with biologics. **Method:** This prospective cohort study done at tertiary medical hospital where 150 patients with severe asthma included as sample. A standardised questionnaire was administered by phone or during outpatient visits and information about symptoms suggestive of COVID-19, hospital admission for COVID-19 and diagnostic testing through nasopharyngeal swab (PCR) or serology (SARS-CoV-2 IgG) was obtained. During study based they divided two types of treatment study group. Where patients who were treated with steroid belong to no biologics group, n=50 where those who are treated with biologics, n =100. belong to Anti-IL5 or anti-IL5R. **Results:** During the study, majority were belong to >50 years age group, 66.67% and 32% had diabetes followed by 23% had hypertension, 15% had Ischemic heart disease and 30% were obese. In non biologic group,

10 cases had PCR positive where in other biologics group PCR positive cases were low. In addition during biologics usage 42% treated with Omalizumab followed by 20.69% cases were treated with Anti-IL5, 50% treated with Mepolizumab, 17.24% treated with Reslizumab and 12.07% treated with Dupilumab. Besides that, higher number daily oral corticosteroid intake cases seen in non biologics group, 15% rather than biologics. Apart from that mean hospital stay duration or o2 therapy cases higher in non-biologics group. **Conclusion:** A tiny number of COVID-19 instances were discovered within this study among adult patients with severe asthma, none of which resulted in death or a very severe clinical course. Treatment with biologics for severe allergic or severe eosinophilic asthma was not linked to an increased risk of SARS-CoV-2 infection or more severe COVID-19 infection.

Keywords: Covid-19, severe asthma, biologics

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INTRODUCTION

Since the virus that causes corona virus disease 2019 (COVID 19) first showed up in Wuhan, China in December 2019, it has rapidly spread throughout the globe and was officially recognized as a pandemic by the World Health Organization (WHO) in March 2020.¹⁻² As of the 13th of November in the year 2020, there were around 53 million people who were infected with the virus, and the fatality rate was approximately 2.44 percent. The number of people who have contracted the infection is continuing to climb.³

The severity of COVID-19 in asthma patients is believed to be impacted by a variety of different factors, as indicated by recent study in this area.

Exacerbating variables may include severe asthma, the use of oral corticosteroids, and a type 2-low asthma phenotype; however, protective factors may include maintenance therapy with inhaled corticosteroids (ICS) and good asthma control.⁴ On the other hand, there is currently no information regarding the risk of COVID-19 in individuals who suffer from severe asthma and/or take biologics. Because eosinopenia is a biomarker for the severity of COVID-19, eosinophil depletion brought on by anti-IL5 and anti-IL5 receptor blocking monoclonal antibodies is a source of concern for patients as well as their treating physicians.⁵

The primary purpose of this research is to investigate the association with Covid-19 and severe asthma patients who are receiving treatment from biologics.

METHODOLOGY

This prospective cohort study was done at tertiary medical hospital where 150 patients with severe asthma included as a sample size.

After obtaining the approval for an amendment from the ethics committee, those 150 patients who are visited hospital

in pandemic time participated in this survey.

A standardised questionnaire was administered by phone or during outpatient visits and information about symptoms suggestive of COVID-19, hospital admission for COVID-19 and diagnostic testing through nasopharyngeal swab (PCR) or serology (SARS-CoV-2 IgG) was obtained. During study based to types of treatment study group was divided. Where patients who were treated with steroid belong to no biologics group, n=50 where those who are treated with biologics, belong to (Anti-IgE), n=42 and Anti-IL5 or anti-IL5R, n=58.

All collected data were coding and input in SPSS-25 for further analysis. Both descriptive and inferential statistics done. Descriptive statistics included frequency distribution, percent, mean, standard deviation; graph, tables, figures and inferential statistics.

RESULTS

In table-1 shows age distribution of the study group where majority were belong to >50 years age group, Group A (50%) and Group B (75%) Followed by Group A (30%) and Group B (15%) belong to 31-40 years group and Group A (20%) and Group B (10%) belong to 20-30 years age group. The following table is given below in detail:

Table-1: Age distribution of the patients

Age group	Group A	Group B
20-30 years	10 (20%)	10(10%)
31-40 years	15(30%)	15(15%)
>50 years	25(50%)	75(75%)

In figure-1 shows gender distribution of the study group where majority were male, Group A (69.44%), Group B(65.35%) . The following figure is given below in detail:

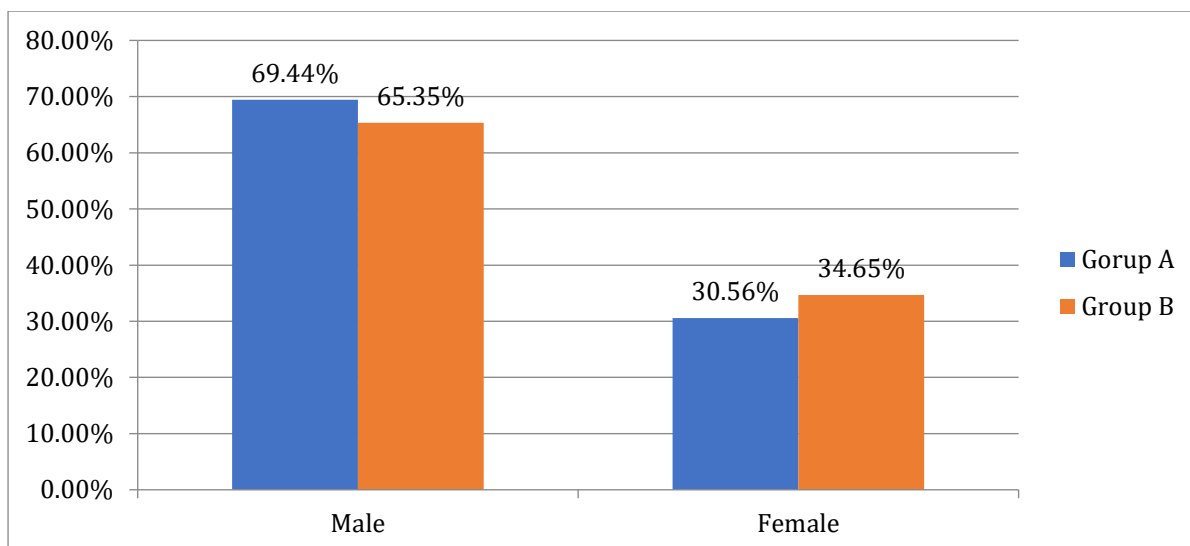


Figure-1: Gender distribution of the patients.

In table-2 shows co morbidities of the patients where Group A (32%) and Group B (34%) had diabetes followed by Group A (23%) and Group B (25%) had hypertension. The following table is given below in detail:

Table-2: Co-morbidities of the patients

Co-morbidities	Group A	Group B
Diabetes	32%	34%
Hypertension	23%	25%
Ischemic heart disease	15%	16%
Obesity	30%	25%

In figure-2 shows smoking status of the patients 35% cases had smoking history. The following figure is given below in detail:

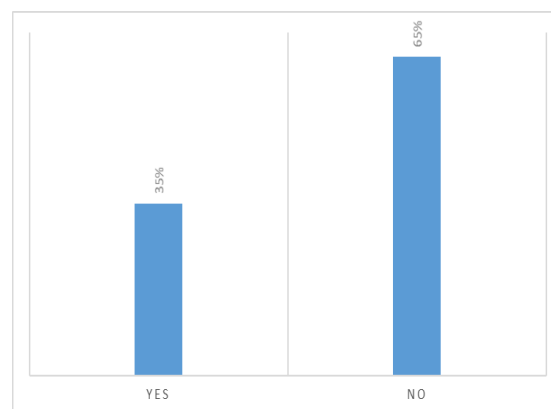


Figure-2: Smoking status of the patients.

In table-2 shows distribution of the patients according to coronavirus disease 2019 (COVID-19) diagnostic testing in non biologic group, 10 cases had PCR positive where in other biologics group PCR positive cases were low. The following table is given below in detail:

Table-2: Distribution of the patients according to corona virus disease 2019 (COVID-19) diagnostic testing

PCR test	Non biologic, n=50	(Anti-IgE), n=42	Anti-IL5 or anti-IL5R, n=58
Yes	10	3	5
No	40	39	53

In table-3 shows Covid-19 symptoms where symptomatic cases were 45% and

asymptomatic cases were 55%. The following table is given below in detail:

Table-3: COVID-19 symptoms

Symptomatic	Group A	Group B
Fever	40%	35%
Dyspnoea	15%	20%
rhinorrhoea	20%	10%
productive cough	11%	15%
headache	16%	15%
chest pain	8%	5%
Sudden olfactory and gustative dysfunction	5%	5%
Asymptomatic	55%	50%

In table-3 shows distribution of the patients according to biologics usage where 42% treated with Omalizumab followed by 20.69% cases were treated with Benralizumab, 50% treated with Mepolizumab, 17.24% treated with Reslizumab and 12.07% treated with Dupilumab. The following table is given below in detail:

Table-3: Distribution of the patients according to biologics usage

(Anti-IgE)	n=42
Omalizumab	42, 42%
Anti-IL5 or anti-IL5R	N=58
Benralizumab	12, 20.69%
Mepolizumab	29, 50%
Reslizumab	10, 17.24%
Dupilumab	7, 12.07%

In table-4 shows treatment status and outcome where higher number daily oral corticosteroid intake cases seen in non biologics group, 15% rather than biologics.

Apart from that mean hospital stay duration or O₂ therapy cases higher in non-biologics group. The following table is given below in detail:

Table-4: Treatment status and outcome

	Non biologic	(Anti-IgE)	Anti-IL5 or anti-IL5R
Daily oral corticosteroid	15%	6%	11%
O ₂ therapy	3%	0	2%
Mean Duration of hospital (days)	7	2	4

DISCUSSION

In our study majority were belong to >50 years age group, 66.67%. Followed by 20% belong to 31-40 years group and 13.33% belong to 20-30 years age group, which was supported by several studies where older adults seen to suffer from severe asthma.⁶⁻⁸

During the study, in biologics usage group 42% treated with Omalizumab followed by

20.69% cases were treated with Benralizumab, 50% treated with Mepolizumab, 17.24% treated with Reslizumab and 12.07% treated with Dupilumab. Which was supported by Adir et.al where 48% treated with Omalizumab followed by 14% cases were treated with Benralizumab, 26% treated with Mepolizumab, 6% treated with

Reslizumab and 6% treated with Dupilumab.⁹

In non biologic group, 10 cases had PCR positive where in other biologics group PCR positive cases were low. In addition, 45% and asymptomatic cases were 55%, where in symptomatic cases Dyspnoea (15%), rhinorrhoea (20%), productive cough (11%), headache (16%) and chest pain (18%), were the most frequently reported symptoms, 40% mentioned fever and only (5%) of the patients experienced sudden olfactory and gustative dysfunction, symptoms that are considered quite specific for COVID-19, which was supported by Tong et.al.¹⁰

Our study of 150 adult asthmatic patients shows that patients treated with biologics or SCS are not at a higher risk of SARS-CoV-2 infection. In addition, there was no significant risk of moderate to severe COVID-19 and mortality in severe asthmatic patients treated with biologics, when compared with those not receiving biologics. In contrast, SCS use was an independent risk factor for worst COVID-19 severity and all-cause mortality. Therefore, our findings underscore the risk

of recent or chronic SCS use in asthmatic patients infected with SARS-CoV-2. Where it was found that higher number daily oral corticosteroid intake cases seen in non biologics group, 15% rather than biologics. Apart from that mean hospital stay duration or o2 therapy cases higher in non-biologics group. Which was supported by study done by Hanon et.al where higher dosages of oral corticosteroid observed in non biologics group.¹¹

Recent use of oral corticosteroids (OCS) has been identified as a risk factor for COVID-19 related death,¹²⁻¹³ but in our this other complication didn't notice.

CONCLUSION

A tiny number of COVID-19 instances were discovered within this study among adult patients with severe asthma, none of which resulted in death or a very severe clinical course. Treatment with biologics for severe allergic or severe eosinophilic asthma was not linked to an increased risk of SARS-CoV-2 infection or more severe COVID-19 infection. These findings support the existing strategy of continuing biologic therapy in severe asthma during the COVID-19 pandemic.

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