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Case Report

Omalizumab Experience in Asthma Patients with Bronchiectasis

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Abstract

Asthma is one of the most common lung diseases in the world and characterised by chronic airway obstruction. Omalizumab is a recombinant human monoclonal antibody being used as a fifth line treatment of asthma. Several studies in the literature have shown that omalizumab treatment maintains symptom control and decreases steroid requirement. A few studies have shown that bronchiectasia may disrupt asthma control. We aimed to investigate the efficacy of omalizumab in asthma patients with bronchiectasis.

Introduction

Asthma is one of the most common lung diseases in the world and characterised by chronic airway obstruction. It is a heterogeneous disease with complex pathophysiology and various etiological factors. According to GINA guidelines, severity of asthma is evaluated by treatment degree required for symptom control [1]. Omalizumab is a recombinant human monoclonal antibody being used as a fifth line treatment of asthma. Several studies in the literature have shown that omalizumab treatment maintains symptom control and decreases steroid requirement.

Asthma can coexist with several clinical entities that may contribute to worsening in prognosis. Bronchiectasis is defined as permanent airway dilatation. Both asthma and bronchiectasis are included in obstructive lung diseases. Several studies have shown that asthma or atopy may play a role in the etiology of bronchiectasis, but studies evaluating coexistence of asthma and bronchiectasis are quite rare. A few studies have shown that bronchiectasis may disrupt asthma control [2-3]. The aim of this study is to investigate the efficacy of omalizumab in asthma patients with bronchiectasis.

Method

Patients being followed up for asthma in Akdeniz University

Faculty of Medicine Chest Disease Outpatient Clinic were screened. Patients having omalizumab treatment in concordance with GINA guidelines for persistent allergic asthma were reviewed and patients who also have bronchiectasis were evaluated. Omalizumab treatment was adjusted for body weight and total IgE level. Omalizumab efficacy was evaluated by spirometry and levels of asthma symptom control. The diagnosis of bronchiectasis was confirmed by high resolution computed tomography (HRCT). Demographic features, total IgE levels, peripheral blood eosinophilia, skin prick testing and medications were noted.

Results

A total 4,235 patients with asthma were evaluated in our outpatient clinic from January 2014 to May 2017. Omalizumab treatment was given to 48 patients for severe persistent allergic asthma. Omalizumab treatment and asthma diagnosis were in concordance with GINA guidelines. In 3 patients having omalizumab treatment, bronchiectasis diagnosis was confirmed with lung computerized tomography. One patient having omalizumab treatment with asthma and bronchiectasis was excluded from the study because of insufficient time for follow up, so 2 patients were included in the study. There was no smoking history in either patient. Asthma duration was 25 and 30 years, respectively. Before omalizumab treatment, patients were on inhaled steroid, long acting β 2 agonist, leukot-

riene receptor antagonist and long acting muscarinic antagonist treatment. One of the patients was receiving long-term oxygen treatment for respiratory failure. Asthma was not under control in these patients based on recent GINA guidelines. Total IgE levels of the patients were 432 IU/ml and 759 IU/ml respectively. House dust mite allergy was observed in one patient, while house dust mite and mould allergies were observed in the other patient. Duration of omalizumab treatment was 12 and 15 months respectively. Basic clinical and demographic features of the patients are shown in Table 1.

	Case 1	Case 2
Age/gender	48/female	56/female
Asthma duration (years)	30	25
Omalizumab use (months)	15	12
Complaint	Dyspnea	Dyspnea
Smoking history	No	No
Physical examination	Rhonci, Rales	Rales
FEV ₁ /FVC	73.66	50.14
FEV ₁ (L) (%)	0.56 (%23.2),	0.67 (%30.8),
Chest radiography	Nodule, cyst	Normal
CT findings	Cystic bronchiectasis	Tubular bronchiectasia
Affected lobe	Bilateral lower lobes	Bilateral diffuse involvement
Total IgE (IU/ml)	432	759
Peripheral blood eosinophilia (mm ³)	90	760
Skin prick test	House dust mite, mould	House dust mite
Asthma symptom control	Uncontrolled	Uncontrolled
Medications	Inhaled steroid, LABA, LAMA, LTRA	Inhaled steroid, LABA, LAMA, LTRA

LABA: long acting β_2 agonist; LTRA:leukotriene receptor antagonist; LAMA: long acting muscarinic antagonist

Table 1. Basic clinical and demographic features of the patients.

Clinical features before and after omalizumab treatment are shown in Table 2.

Case		Before treatment	After treatment
Case 1	FEV ₁ (L, %)	0.57 (23.9)	0.57 (24.1)
	FVC (L, %)	0.86 (30.5)	0.77 (27.7)
	FEV/FVC	65.71	72.07
	Exacerbations/year	4	0
	GINA control level	Uncontrolled	Partly controlled
Case 2	FEV ₁ (L, %)	0.67 (30.8)	1.41 (67)
	FVC (L, %)	1.25 (48.5)	2.15 (86.2)
	FEV ₁ /FVC	50.14	65
	Exacerbations/year	5	2
	GINA control level	Uncontrolled	Well controlled

Table 2. Clinical features before and after omalizumab treatment.

Discussion

Asthma treatment is made step by step according to the GINA guidelines. Omalizumab has been suggested as a first line treatment for persistent allergic asthma in recent years. Asthma is a heterogeneous disease and in cases with coexisting with bronchiectasis, prognosis can worsen and exacerbations may be seen more often [4]. In patients with severe asthma, chest HRCT should be performed where there is atypical presentation, abundant mucus production, rapid decline in respiratory function, or reduced carbon monoxide transfer factor coefficient [3]. If the patient has uncontrolled asthma, HRCT should be considered to look for concurrent bronchiectasis [3-4]. There are insufficient studies evaluating omalizumab efficacy in conditions causing difficulty in asthma control such as Obstructive Sleep Apnea Syndrome (OSAS), Chronic Obstructive Pulmonary Disease (COPD) and bronchiectasis. There is a few studies in the literature about asthma COPD overlap syndrome (ACOS) and these studies have shown that omalizumab treatment decreased attack frequency and improved asthma control.

In the present study, significant improvement in asthma control level and exacerbations was observed after omalizumab treatment. This case report is the first study showing omalizumab efficacy in patients with asthma and bronchiectasis.

We reported our experience in asthma patients having sensitivity to at least one perennial allergen. Reversibility tests were positive in our patients. Asthma control levels were significantly improved after omalizumab treatment in both patients. Efficacy of omalizumab on respiratory function varies in the literature. In a randomised controlled trial of patients with asthma, FEV1 levels were significantly improved with omal-

izumab[5], whereas in another study [6] omalizumab treatment did not improve respiratory function, but had beneficial effects on asthma control in patients with ACOS.

Conclusion

This study is the first to evaluate omalizumab efficacy in patients with asthma and bronchiectasis. Our study can be a step for future studies to be performed on higher numbers of patients. Our study showed that enough time omalizumab treatment can have benefits on clinical and physiological parameters of patients. Therefore our data should be supported with studies on higher number patient groups.

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