

Role of mepolizumab in severe allergic asthma with vocal cord polyp

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ABSTRACT

Interleukin (IL)-5 plays an important role in development, recruitment, and survival of eosinophils, thereby causing debilitating signs and symptoms associated with severe eosinophilic asthma. Mepolizumab is a humanized monoclonal antibody (mAb) against IL-5 which selectively inhibits eosinophilic inflammation and reduces the amount of eosinophils. This reduction is seen in both sputum and blood, resulting in a reduction in exacerbations and in time the need for using systemic steroids. The role of mepolizumab and its effect is still not fully known as there are less real-life studies available. We herewith present a case of severe eosinophilic asthma with vocal polyp managed by mepolizumab.

KEY WORDS: Mepolizumab, severe eosinophilic asthma, vocal cord polyp

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BACKGROUND

Asthma is a chronic inflammatory condition involving the airways with varying pathophysiological mechanisms, clinical symptoms, and outcomes. However, about 5–10% of asthma patients exhibit a more severe disease process with poor asthma control, frequent severe exacerbations, and accelerated loss of lung function, despite intensive treatment.^[1,2] Patients with severe asthma experience frequent exacerbations and may require daily maintenance oral corticosteroids when maximal inhaled therapy proves insufficient to reduce exacerbation risk or to control day-to-day symptoms and is associated with substantial morbidity, mortality, and health-care costs.^[3] Severe eosinophilic asthma is a subgroup, as indicated by eosinophil counts of at least 150 cells/ μ L in blood, or more than 2% in sputum, or both.^[2,4]

Interleukin (IL)-5 is a cytokine responsible for development, recruitment, and survival of eosinophils, hence causing the symptoms in severe eosinophilic asthma (SEA). Mepolizumab is a humanized monoclonal antibody (mAb) against IL-5 which selectively inhibits eosinophilic inflammation^[5,6] and reduces the amount of eosinophils in both sputum and blood, resulting in a reduction in exacerbations and in the need for treatment with systemic steroids.^[5-10] The role of mepolizumab and its effect is still not fully known as there are less real-life studies available. In this paper, we present a case of SEA with vocal polyp managed by mepolizumab.

CASE PRESENTATION

A male in his mid-70s presented to the clinic with progressive cough and hoarseness of voice since one and a half years.

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The cough was dry, progressive not associated with diurnal variation. There is no history of fever or weight loss. He is a known case of diabetes mellitus, hypertension, and a chronic smoker. He has a mass on vocal cord for which he has also received a course of radiotherapy in suspicion of malignancy of vocal cords. He was on high-dose oral corticosteroids and bronchodilators. On examination, his vitals were stable, there was a hoarseness of voice with a bilateral wheeze on chest examination. A laryngoscopy was advised to rule out malignancy, which showed a benign polyp on vocal cord. His serum IgE and Angiotensin Converting Enzyme (ACE) were high along with PFT showing obstructive pattern. Hence, a diagnosis of severe allergic asthma was made and was started on Mepolizumab 100 mg subcutaneously once every 4 weeks. Over the period of 4 months, his ACT score improved significantly and FEV1 became normal [Table 1]. The cough and hoarseness of voice also improved and wheezing has stopped. He did not have an acute exacerbation since the beginning of his treatment and had zero ER visits. The vocal cord polyp which was causing the hoarseness has also reduced in size.

INVESTIGATIONS

On examination his vitals were stable, there was a hoarseness of voice with a bilateral wheeze on chest examination.

A laryngoscopy was advised to rule out malignancy, which showed a benign polyp on vocal cord. His serum IgE and ACE were high along with PFT showing obstructive pattern.

- AEC: 1.09, IgE: 4471 before treatment FEV1 1.85.

DIFFERENTIAL DIAGNOSIS

1. Benign vocal cord polyp with airway obstruction.
2. ILD: HRCT B/L peripheral reticulations.
3. Asthma COPD overlap syndrome (ACOS).

OUTCOME AND FOLLOW-UP

Outcome depicted in Table 1.

TREATMENT

Before Mepolizumab. Tab methylprednisolone 40 mg daily. Nebulization with ipratropium and levo salbutamol

twice a day. Nebulization with budesonide 0.5 mg twice a day. Tab montelukast once a day. Tab acetylcysteine and acebrophylline twice a day. Salmeterol (25mcg) + Fluticasone Propionate (250mcg) twice a day. Tiotropium inhaler once a day. Levosalbutamol (50mcg) + Ipratropium (20mcg) inhaler SOS at least twice a week. ER visit once a month.

After mepolizumab: current medication. Inj. mepolizumab 100 mcg once a month. Tab vitamin D3 once a week. Tab calcium 500 mcg once a day. No ER visit. No steroids. No inhaler.

DISCUSSION

SEA is a distinct phenotype of asthma that is associated with sputum eosinophilia, thickening of the basement membrane zone and often by corticosteroid responsiveness.^[11] It is associated with more severe exacerbation with poor control, loss of lung function and frequent visits to ER. Despite the use of high dose of corticosteroids and long-acting beta agonists, it is responsible for significant morbidity and mortality adding to the financial burden of asthma.^[12] The advent of biologics has changed the fate of patients suffering from SEA.

In SIRUS^[13] (steroid reduction with mepolizumab study) and MENSA^[14] (mepolizumab as adjunctive therapy in patients with severe asthma) trials the daily dose of oral corticosteroid therapy, along with the symptoms and the need for ER visits decreased significantly. There was a significant improvement in quality of life and slight increase in FEV1 with progressive decrease in eosinophil levels was noted from week 4 to maximal reduction at week 12.

SEA with nasal polyps (NP) is associated with higher blood eosinophilic count which may be explained by local generation of IL-5 in the airways.^[15] Higher blood eosinophil counts are a predictive biomarker of better response to mepolizumab in SEA;^[14,16] hence, it has greater benefit in reducing severe exacerbations in patients with SEA plus NP compared to SEA without NP. Mepolizumab, as a systemic therapy, helps with improvement in NP size and health quality of life in patients with of SEA with NP.^[17] In our case, the decrease in size of vocal cord polyp along with improvement of SEA is directly associated with the use of mepolizumab.

In conclusion, the effect of mepolizumab on SEA and associated with nasal polyposis has been well documented; its effect on vocal cord polyps is still unclear and needs further investigation.

Learning points/Take-home messages

- Mepolizumab has a beneficial role in SEA.
- Mepolizumab helps in significant reversal of airway function and reduction in dose of oral steroids in SEA.
- Use of mepolizumab is not restricted to SEA with upper

Table 1: Pre and post treatment values after the use of mepolizumab

	Pretreatment	Six-week posttreatment
Absolute eosinophils count (>150 cells/cumm)	1810	200
IgE/IgE-specific allergen	4471	Normal
Symptom control ACT scoring	15	21
FVC ratio (prebronchodilator)	1.90	2.43
FEV1	1.42	1.86

airway polyps but can also be used for other airway polyposes.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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