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Research Article

Medication Utilization Evaluation of Mepolizumab in Managing Eosinophilic Asthma in a Tertiary Hospital

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Abstract

Background: Mepolizumab is a biologic agent that represents a humanized monoclonal antibody that targets human interleukin-5 to prevent its interaction with the alpha-chain of the IL-5 receptor.

Several studies suggest the therapeutic benefit of Mepolizumab as an add-on maintenance therapy of severe asthma in patients with an eosinophilic phenotype. A retrospective drug utilization review of Mepolizumab was performed at King Fahad Medical City (KFMC) to determine if the agent used for an appropriate indication, correct dosing, proper monitoring, and also reviewing potential outcomes safety and efficacy.

Method: All patients on Mepolizumab reviewed through computerized outpatient prescription records (CORTEX) from the 3rd of January 2018 to the 1st of July 2019. The study included 39 patients on Mepolizumab 100mg subcutaneously every month. Adverse drug reactions were collected using a reporting software (Datix) the hospital uses. Data were collected using a modified excel data collection sheet.

Results: During the study period, 39 eligible patients, 76% were female, with a mean age of 50 years. According to the available data, Mepolizumab showed a reduction in absolute eosinophil count for 69% of patients and a reduction of oral/systemic dose of corticosteroid in 50% of the cases. Furthermore, there were improvements in Pulmonary Function Test (PFT) in 80% of the patients with an average change of 15%. The asthma control test (ACT) also improved for all cases, with an average of approximately 5 points. No adverse drug reactions or allergies reported during the study.

Conclusion: Mepolizumab showed an effect in managing severe eosinophilic asthma and has been utilized appropriately by the health care provider at King Fahad Medical City. The study showed efficacy in alliance with published evidence.

Keywords: *Asthma; Mepolizumab; King Fahad Medical City (KFMC)*

Introduction

Asthma is a chronic inflammatory disease involving the airways with varying pathophysiological mechanisms, clinical symptoms and outcomes [1]. It affects around 339 million people worldwide [2]. It is generally controlled by conventional therapies, including inhaled corticosteroids and long-acting $\beta_2$agonists. Eosinophilic asthma characterized by eosinophilic airway inflammation. Interleukin (IL)-5 is the main cytokine responsible. Several studies suggest the therapeutic benefit of Mepolizumab as an add-on maintenance therapy of se-

vere asthma in patients with an eosinophilic phenotype (Figure 1) [1,3]. A retrospective medication utilization evaluation was performed at King Fahad Medical City (KFMC). The primary objective of this MUE was to of Mepolizumab to determine if the agent used for an appropriate indication, correct dosing, proper monitoring, and also reviewing potential outcomes safety and efficacy.

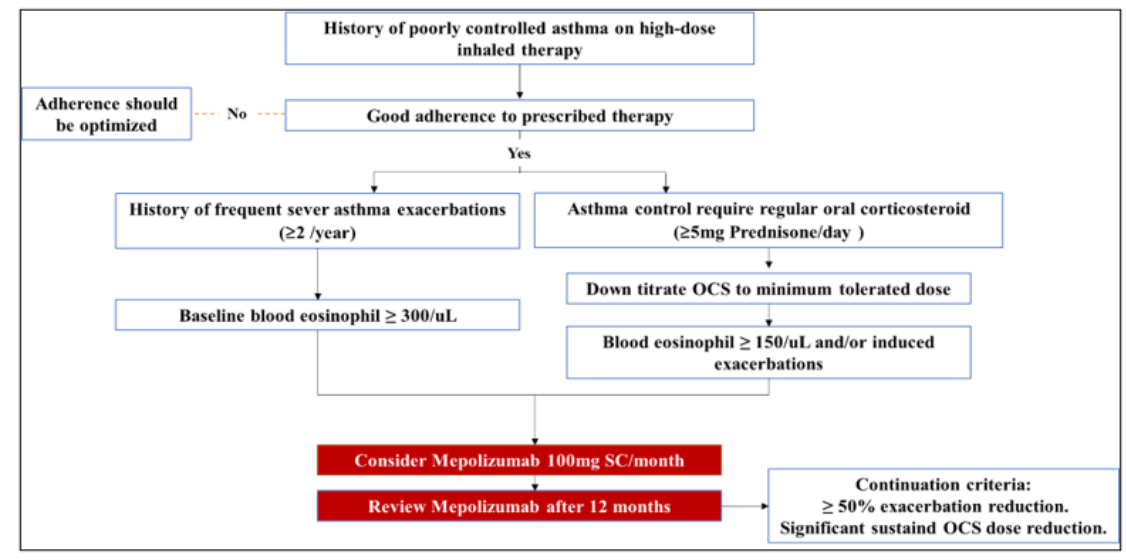

Figure 1

Method

All severely asthmatic patients and patients on Mepolizumab retrospectively reviewed through computerized outpatient prescription records (CORTEX) from the 3rd of January 2018 to the 1st of July 2019. Patients receiving at least one dose of mepolizumab were eligible for inclusion.

Data extracted from the CORTEX included patient demographics (age, weight, and baseline renal function), number of current asthma medication, indication, documented allergy, outpatient dosage strength, number of doses administered, appropriateness of treatment dose, assessment for appropriate monitoring of laboratory data, prescribing eligibility followed reason for medication discontinuation, documented adverse drug reaction and medication errors related to the medication. Doses evaluated as appropriate based on manufacturer recommended dosing and Specific reasons for medication discontinuation. Based on the hospital protocols, appropriate monitoring was defined as baseline eosinophil count and then at least once monthly.

Adverse drug reactions were collected using reporting software (Datix). A study done at King Fahad Medical City, Riyadh, Saudi Arabia, and data was collected using a modified excel data collection sheet.

Results

All patients on Mepolizumab were reviewed retrospectively from the 3rd of January, 2018 to the 1st of July, 2019. A patient diagnosed with severe asthma were eligible to be evaluated (See figure 2 and table 1).

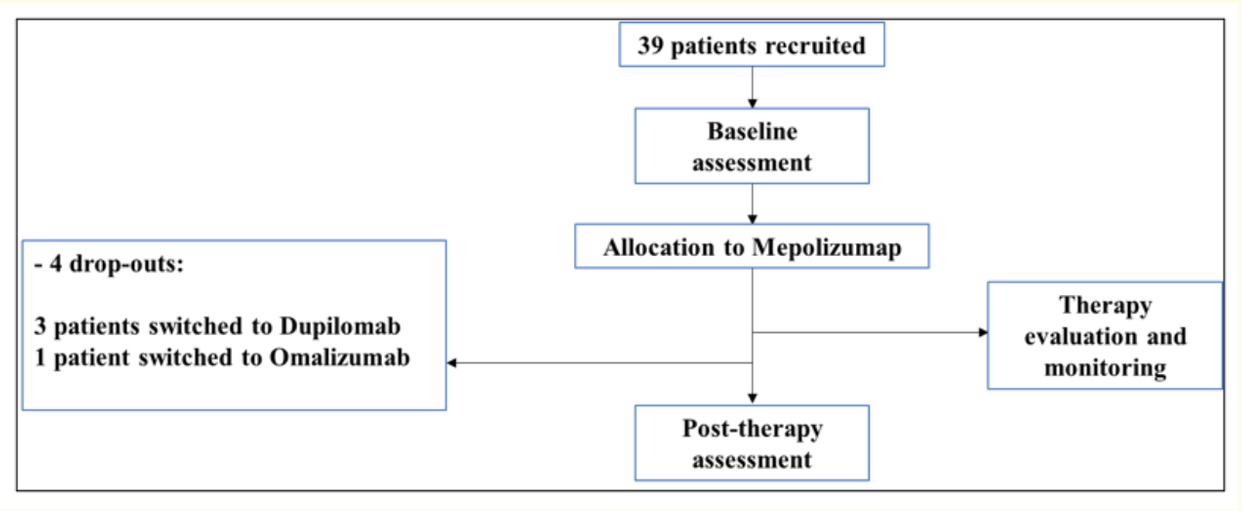

Figure 2

Demographics	
Median age (Years old)	50
Ave. weight	79
Ave. Scr (mmol)	62
Current asthma medication (median)	4
Number of document allergy	3
Number of drug interaction with Mepolizumab	0
Dose of Mepolizumab	100 mg subQ Every month

Table 1

A total of 39 patients evaluated, no adverse drug reaction was reported after mepolizumab initiation neither medication error. The average eosinophil count was 683/mm^3 before mepolizumab initiation. Eosinophil count reduced by 69% after mepolizumab initiation (Figure 3). The pulmonary function test improved in 80% of the patient by an average change of 15%. Patients monitored monthly. All patients adhered to drug therapy (Table 2).

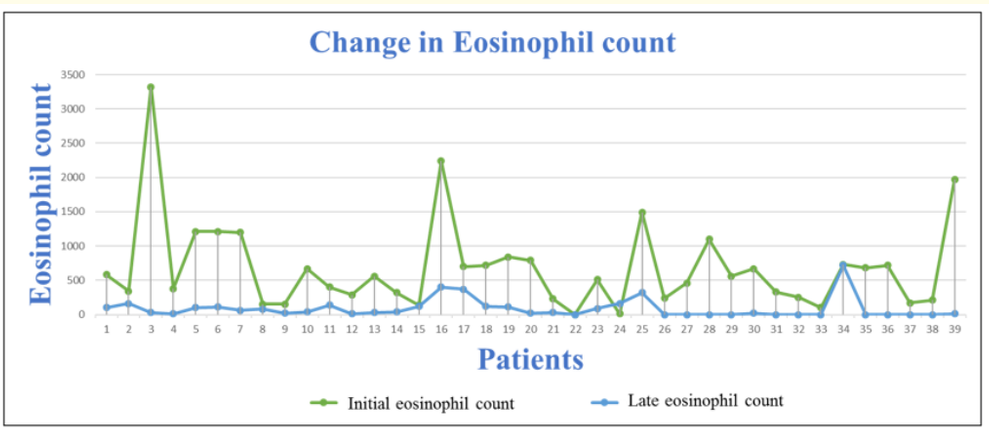

Figure 3

Result	
No. of ADR reported	0
No. of medication error reported	0
Aver. Initial absolute eosinophil count	683
Aver. Latest absolute eosinophil count	122
No. of patients on systemic steroid	14
Efficacy evaluation	
% Reduction in absolute eosinophil count	69
% Reduction in oral/systemic corticosteroid dose Y/N	50
PFT improved	80 %
The average change in PFT	15%
%ACT improved	100% (by an average of ~ 5 points)
% Therapy discontinued	10
Reasons for discontinuation	
Changed to dupilumab (number)	3
Changed to Omalizumab	1
% patient monitoring	100
Aver. frequency of monitoring	Every month

Table 2

There was a reduction in corticosteroid dose in 50% of patients after treatment initiation (Figure 4). An asthma control test monitored, and there is an improvement in 100% of cases by an average reduction of 5 points (Figure 5). Mepolizumab prescribing restricted for consultant pulmonologists, and the restriction followed.

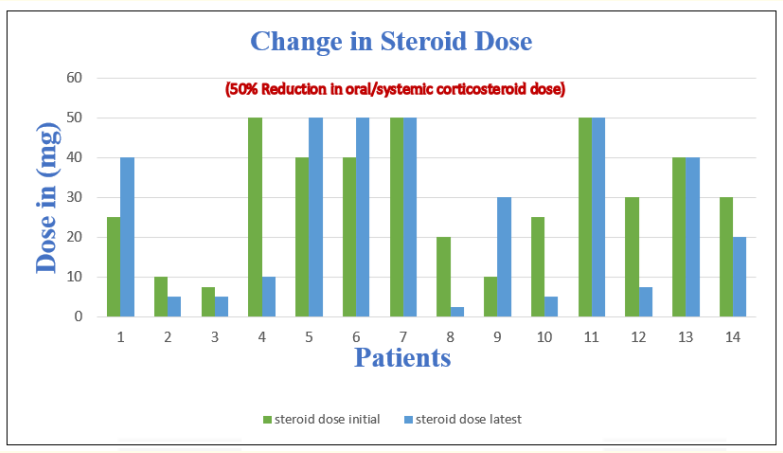

Figure 4

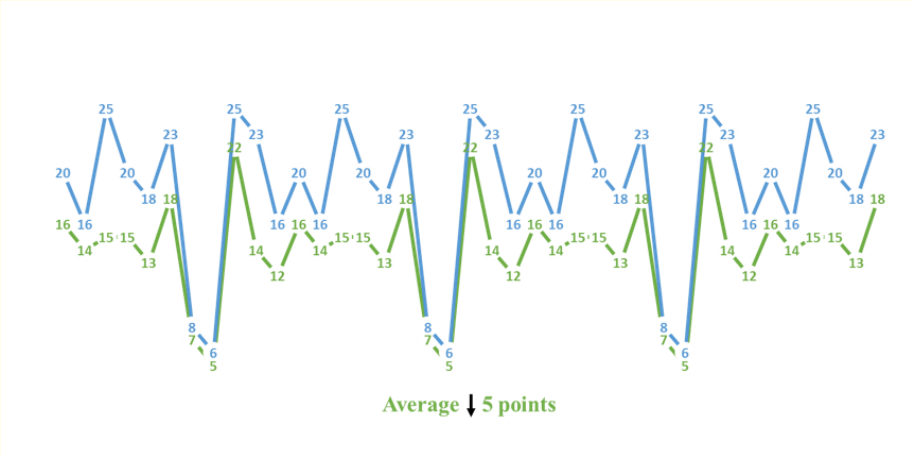

Figure 4

Discussion

With any expensive and new medication added to the hospital formulary, medication utilization evaluation is essential to evaluate mepolizumab use within clinical practice along with potential safety and effectiveness outcomes. Due to the high cost of Mepolizumab, and as it newly added to the hospital formulary, the medication must be assessed. The available evidence shows a reduction in severe asthma exacerbation by ~55% and improved quality of life, lung function, and symptoms [4]. Overall, Mepolizumab prescribed and dosed correctly in all patients. All patient has an eosinophil count more than 300/mm^3 which shows the medication started appropriately as per guidelines recommended. Oral corticosteroid requirement reduced by 50% that shows the glucocorticoid-sparing effect of Mepolizumab with also significant improvements in the Asthma Control Test by an average of 5 points as reported in published evidence [3,5]. There was four mepolizumab discontinuation due to clinical non-responsiveness despite a reduction in eosinophil counts. Adverse drug reaction not reported for Mepolizumab due to either the patients don't experience any ADR, or there is a lack of proper education to the patient by health care practitioner. Since practitioners often have less experience with Mepolizumab, it is vital to educate on appropriate use and possible ADR may the patient experience to enhance the safety and effectiveness of Mepolizumab. Finally, due to potential allergic reaction complications inherent with all biological therapy, patient counseling is imperative. This MUE is to evaluate the use of these medications within a tertiary hospital; however, it is not without limitations. Adverse drug reaction was underreported due to either limited access to the reporting system by the patient or lack of patient education. As a result of this MUE, medication ordering changes implemented to improve the safe and effective use of Mepolizumab. An order set to be applied to reinforce the FDA approved indications and dosing, along with ADR reporting in each reordering prescription. To increase patient education, Inservice education to pharmacists to educate patients on Mepolizumab. The continuous patient evaluation will show the impact of this MUE on clinical practice.

Conclusion

This medication utilization evaluation within a tertiary health care hospital focused on the utilization of mepolizumab therapy in severely asthmatic patients. Mepolizumab was appropriately used, utilizing FDA approved indications and dosing recommendations. Also, rates of ADR were less compared to clinical trials. However, quality improvement efforts implemented to improve the appropriate and safe use of this medication.

Bibliography

1. Global Initiative for Asthma. Global strategy for asthma management and prevention (2019).

2. Global asthma report (2020).

3. Strauss RA. "Treatment of Steroid-Dependent Asthmatics with Mepolizumab". InA35. ASTHMA CLINICAL STUDIES II, American Thoracic Society (2018): A1393.

4. Farne HA., *et al*. "Anti-IL5 therapies for asthma". *Cochrane Database of Systematic Reviews* 9 (2017): CD010834.

5. Bel EH., *et al*. "Oral glucocorticoid-sparing effect of Mepolizumab in eosinophilic asthma". *New England Journal of Medicine* 371.13 (2014): 1189-1197.

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