

Benralizumab and risk of elevation in serum cholesterol

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Introduction

Benralizumab, a monoclonal antibody, which is used in the treatment of asthma, has a long-term safety and tolerability. There is no previously documented correlation between benralizumab and lipid profile disturbance. Our case raises concern and the need to follow the lipid panel in patients receiving benralizumab routinely since there is a risk for elevation in serum cholesterol.

Case presentation

A 27-year-old lady was diagnosed to have asthma 4 years prior to presentation, where the patient was resistant to steroids and bronchodilators, and was started on omalizumab without improvement. The patient was switched to benralizumab regimen (30 mg SC every 4 weeks for the first 3 doses, then 30 mg every 8 weeks) with marked improvement of symptoms, where steroids were tapered and stopped successfully. The patient underwent a strict diet, sports, and rehabilitation regimen resulting in weight loss from 90 kgs to 61 kgs and became symptom-free and resumed normal daily activities. Routine laboratory evaluation showed marked elevation of serum total cholesterol/LDL (shown in Table 1). Thorough work up and follow up didn't elucidate any cause for the elevated LDL except for the introduction of benralizumab 11 months ago. There was no family history of hypercholesterolemia.

Results and discussion

Biologic agents including monoclonal antibodies gained the approval of U.S. Food and Drug Administration (FDA) for the management of many allergic and immunologic disorders including hypereosinophilic syndrome, chronic urticaria, sinusitis with nasal polyps, and moderate to severe asthma. Benralizumab is a humanized afucosylated monoclonal antibody that is directed against the alpha subunit of the IL-5 receptor (IL-5Rα), which is primarily expressed by human eosinophils and basophils. The most reported adverse events

were nasopharyngitis [1,2], worsening asthma [1,2], headache [1], bronchitis [2], viral upper respiratory tract infection [1], and rarely pericarditis and gastritis [1]. Criner, et al. [3] reported that adverse events and serious adverse events were balanced across the treatment groups, and all-cause mortality was less than 4% across all treatment groups. Moreover, these safety data are consistent with those reported in the phase 3 trials of benralizumab for severe, uncontrolled eosinophilic asthma [3]. Another meta-analysis comparing efficacy of mepolizumab, benralizumab, and dupilumab in eosinophilic asthma didn't show any other special side effect of this class of medication [4]. Furthermore, the BORA trial documented that benralizumab use was associated with long-term safety and tolerability [5,6]. Finally, regarding the safety and tolerability of biologics, there were no serious adverse effects reported across the studies. It is likely that minor adverse effects did occur and remained unreported, making it difficult to appreciate the safety profile of these drugs [7]. In their review, Sitek, et al. [8] provided a comprehensive summary of risks and adverse effects reported for the current FDA-approved biologics used in management of allergic and immunologic disorders, including omalizumab, benralizumab, dupilumab, mepolizumab, reslizumab, tezepelumab, and tralokinumab. This review focused on the risk of hypersensitivity reactions, pregnancy-specific considerations, risk of infection, and risk of malignancy. Where relevant, they highlighted drug-specific issues, such as the potential development of eosinophilia in patients receiving dupilumab and included recommendations provided by expert consensus groups and/or pharmaceutical companies regarding mitigation of the potential risks associated with use of these biologics [8]. In our case, this is the first possible correlation between benralizumab and hypercholesterolemia. The patient was started on atorvastatin 40 mg.

Conclusion

In conclusion, benralizumab and consequently monoclonal antibodies may play a role in elevation of serum cholesterol, and routine follow up is recommended to avoid future adverse events.

Conflicts of interest

The author declares no conflict of interest.

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	October 2022	October 2023
Total cholesterol mg/dl	157	281
LDL mg/dl	86	218
HDL mg/dl	58	50
Triglyceride mmol/L	0.70	0.75
Liver enzymes, Renal Function tests, electrolytes, uric acid, Thyroid function test, and hemoglobin were normal and stable were normal.		

Table 1. Comparison of lipid profile parameters before and after initiation of benralizumab therapy, showing a marked elevation in total cholesterol and LDL levels over a 12-month period

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