Can Omalizumab Be Effective in Chronic Eosinophilic Pneumonia?

To the Editor:

We have recently read with interest the article by Kaya et al.1 in CHEST (August 2012) reporting on a patient suffering from chronic eosinophilic pneumonia (CEP) who responded successfully to omalizumab. Five years ago, we attended a 43-year-old nonsmoking man who complained of cough, fever, dyspnea, and wheezing. On the basis of his clinical presentation, peripheral blood and BAL eosinophilia, and the presence of bilateral peripheral infiltrates on the chest radiograph, the diagnosis of CEP was made. As in the Kaya et al.1 case, oral corticosteroids (OCs) were started with an initial successful response. After 3 months of therapy, the dose of OCs was progressively tapered. When the dose reached 10 mg prednisolone, a relapse occurred that forced us to increase the dose of OCs. The patient improved, and bronchospasm and chest infiltrates disappeared.

During the process of OC tapering, a new relapse occurred, bronchospasm being the most relevant clinical symptom that forced us to increase again the dose of OCs. A skin prick test was performed that was positive for mite dust. Total blood IgE level was 253 IU/mL. Omalizumab treatment was started at the dose calculated according to the patient’s weight and IgE concentration. The patient progressively improved, and after 18 months of treatment (6 months to check clinical response followed by 12 months of stabilization), according to our decreasing-dose protocol of omalizumab,2 the dose of omalizumab was progressively tapered by 50% every 6 months. The patient’s tolerance was excellent, and omalizumab treatment could be safely quit 12 months later. The patient has remained free of symptoms of CEP for >2 years, requiring only two short courses of OCs for his asthma.

The IgE-dependent inflammatory phenomena have been studied in depth and are clearly recognized in atopic subjects, and the anti-IgE blocking effect of omalizumab has been clearly shown. Additional benefits can be provided by the findings of Kalesnikoff et al.3 who observed that by binding to its high-affinity receptor, FcεRI, IgE was able to induce intracellular signaling pathways, resulting in the production of cytokines and the enhancement of mast-cell survival on its own, without cross-linking by allergens. In addition, IgE can directly bind and activate receptors present on eosinophils, neutrophils, and monocytes. As a result, the rationale for the use of omalizumab in diseases other than allergy is based on its blocking effect on IgE, which inhibits part of the T helper cell type 2 immune response, thus, reducing recruitment and activation of effector cells of the inflammatory process, including eosinophils. Because IgE effector cells (ie, mast cells and basophils) are a source of proinflammatory molecules, anti-IgE therapy may have anti-inflammatory properties that reduce circulating and tissue eosinophils; indeed, this role has been suggested in other diseases, such as eosinophil-associated GI disorders.4 More recently, Noga et al.5 demonstrated an increase in eosinophil apoptosis and a decrease in granulocyte-macrophage colony-stimulating factor. All this information can help to explain the benefits of omalizumab in CEP.

In their report, Kaya et al.1 communicate that their patient remains free of symptoms 15 months after omalizumab treatment began, but they do not state future treatment options. We believe some of these patients can benefit from a decreasing dose protocol.2

Christian Domingo, MD
Xavier Pomares, MD
Barcelona, Spain

Affiliations: From the Servei de Pneumologia, Corporació Parc Taulí, Departament de Medicina, Universitat Autònoma de Barcelona.

Funding/Support: The authors’ research was partially supported by Beca FUCAP 2008.

Financial/nonfinancial disclosures: The authors have reported to CHEST that no potential conflicts of interest exist with any companies/organizations whose products or services may be discussed in this article.

Correspondence to: Christian Domingo, MD, Servei de Pneumologia, Corporació Parc Taulí, Parc Taulí I, 08208 Sabadell, Barcelona, Spain; e-mail: cdomingo@tauli.cat

© 2013 American College of Chest Physicians. Reproduction of this article is prohibited without written permission from the American College of Chest Physicians. See online for more details.

DOI: 10.1378/chest.12-2035

ACKNOWLEDGMENTS

Role of sponsors: The sponsor had no role in the design of the study, the collection and analysis of the data, or in the preparation of the manuscript.

REFERENCES


Response

To the Editor:

We read the correspondence by Drs Domingo and Pomares about our case report1 with interest. The case described by the authors, and probably some other unpublished cases, support the potential benefits of omalizumab in chronic eosinophilic pneumonia and other hypereosinophilic states.

The mechanism of the effect of omalizumab on hypereosinophilia is unclear; however, the defective expression of CD23 on B cells, as in our case, might be an explanation.1 The low-affinity receptor for IgE, FcεRII, also known as CD23, is expressed on
the B cells, monocytes, eosinophils, and Langerhans cells and plays an important role in the regulation of IgE production by B cells.\(^2\)

This molecule is a transmembrane glycoprotein (type 2) of approximately 45 kDa and can be cleaved to yield a range of freely soluble CD23 (sCD23) fragments by the metalloprotease ADAM10. The best characterized ligands of CD23 are IgE and CD21, respectively. It was shown that antigen-IgE complexes are captured and internalized by CD23, which facilitate the antigen processing and presentation with major histocompatibility complex class II proteins.\(^1\) In addition, CD23 serves as a negative regulator of IgE production, which has been demonstrated through experimental animal studies in vivo. Increased production of IgE and defective antigen presentation were found in mice deficient in CD23.\(^3\)

Accordingly, our case has defective expression of CD23 on B cells. Because of technical and financial reasons, we could analyze neither mutation of this molecule nor its soluble fragment in serum. We suggest that future studies investigating the role of CD23 (both its soluble fragments and expression on inflammatory cells, including B cells and eosinophils) and its mutation may provide some information about allergic and hypereosinophilic disorders and the mechanism of action of omalizumab on them.

The optimal duration of omalizumab treatment in allergic diseases is not known. It has been reported that lowering the recommended omalizumab dose may likely result in a clinical deterioration.\(^4\) On the other hand, however, after the discontinuation of the drug some effect of the therapy may continue up to 3 years.\(^6\) In our chronic eosinophilic pneumonia case, we plan to taper and discontinue omalizumab after completing at least 3 years of therapy.

**Affiliations:** From the Turkish Armed Forces Rehabilitation Center (Dr Kaya); and the Department of Pulmonary Medicine (Drs Gümüş, Uçar, Aydoğan, Tozkoparan, and Bilgic), and the Department of Allergy and Clinical Immunology (Dr Muşabak), Gulhane Military Medical Academy, Dr Kaya is currently affiliated with the Department of Pulmonary Medicine, Gulhane Military Medical Academy (Ankara, Turkey) and George Washington University (Washington, DC).

**Financial/Nonfinancial disclosures:** The authors have reported to CHEST that no potential conflicts of interest exist with any companies/organizations whose products or services may be discussed in this article.

**Correspondence to:** Hatice Kaya, MD, TSK Rehabilitasyon Merkezi, 06540, Bilkent, Ankara, Turkey; e-mail: drhaticekaya@yahoo.com

© 2013 American College of Chest Physicians. Reproduction of this article is prohibited without written permission from the American College of Chest Physicians. See online for more details.

**DOI:** 10.1378/chest.12-2249

**REFERENCES**


**Weekend Effect for Pulmonary Embolism and Other Acute Cardiovascular Diseases**

**To the Editor:**

In an issue of CHEST (September 2012), Nanchal et al\(^1\) presented interesting data about the existence of a “weekend effect” for pulmonary embolism. Patients admitted to the hospital on a weekend, in fact, had a 19% increased risk of death. These results represent further confirmation of previous reports from Canada (cited by the authors) and from the Emilia-Romagna region of Italy by our group\(^2\) that both found a 17% increased risk of death.

We have extensively explored the possible presence of a different mortality rate between weekdays and weekends and confirmed an even greater increased risk of death for other acute cardiovascular diseases as well (ie, acute heart failure [OR, 1.33]\(^3\) and aortic aneurysm rupture or dissection [OR, 1.31]\(^4\)). Medical and nursing understaffing, shortage of diagnostic or procedural services, and presence of inexperienced residents have been suggested as possible causes. However, the data collected in Italy (and in the Emilia-Romagna region in particular) do not support such interpretations, since that health system and the hospital service organization in Italy are not comparable with that of countries like the United States or the United Kingdom.\(^4\)

Temporal aspects of onset of acute cardiovascular and cerebrovascular diseases might play a role as well, and patterns of circadian and seasonal times of onset of certain diseases are known. It is possible that acute diseases do not present with equal severity relative to time, that is, day of the week or hour of the day. A single-center study on acute coronary syndromes (ACSs) explored this possibility and showed that, although there were fewer ACS admissions than expected on nights and weekends, the proportion of patients with ACS presenting with ST-elevation myocardial infarctions was 64% higher on weekends.\(^5\) A higher severity might be linked with higher risk of mortality, and several parameters of severity collected by Nanchal et al\(^6\) (eg, need for mechanical ventilation, thrombolytic therapy use, or use of vasopressors) are in agreement with this. Further studies are needed to explore this intriguing relationship between time of presentation and clinical outcome of acute cardiovascular diseases.

Roberto Manfredini, MD

Raffaella Salmi, MD

Massimo Gallerani, MD

Ferrara, Italy

**Affiliations:** From the Department of Medical Sciences and Vascular Diseases Center (Dr Manfredini), University of Ferrara; and the 2nd Internal Medicine Unit (Dr Salmi), and 1st Internal Medicine Unit (Dr Gallerani), Azienda Ospedaliera-Universitaria of Ferrara.