Dupilumab increases aspirin tolerance in NSAID-exacerbated respiratory disease

Sven Schneider[1], Katharina Poglitsch[2], Christina Morgenstern[3], Tamara Quint[2], Katharina Gangl[1], Christoph Sinz[2], Tina Bartosik[1], Nicholas James Campion[1], David Tianxiang Liu[1], Lukas David Landegger[1], Aldine Tu[1], Victoria Stanek[1], Marianne Rocha-Hasler[1], Christine Bangert[2] and Julia Eckl-Dorna[1]

[1]Dept of Otorhinolaryngology, General Hospital and Medical University of Vienna, Vienna, Austria. [2]Dept of Dermatology, General Hospital and Medical University of Vienna, Vienna, Austria. [3]Science Impuls, Seeboden, Austria.

Corresponding author: Christine Bangert (christine.bangert@meduniwien.ac.at)

Cite this article as: Schneider S, Poglitsch K, Morgenstern C, *et al*. Dupilumab increases aspirin tolerance in NSAID-exacerbated respiratory disease. *Eur Respir J* 2023; 61: 2201335 [DOI: 10.1183/13993003.01335-2022].

Abstract

Background Nonsteroidal anti-inflammatory drug (NSAID)-exacerbated respiratory disease (N-ERD) comprises the triad of chronic rhinosinusitis with nasal polyps, asthma and intolerance to NSAIDs. Dupilumab treatment, targeting the interleukin-4 (IL-4) receptor α, significantly reduces polyp burden as well as asthma symptoms. Here we aimed to investigate the effect of dupilumab on aspirin intolerance, burden of disease and nasal cytokine profiles in patients with N-ERD.

Methods In this open-label trial, adult patients with confirmed N-ERD were treated with dupilumab for 6 months. Clinical parameters (*e.g.* total polyp scores, quality of life questionnaires, smell test, spirometry), oral aspirin provocation testing and blood, nasal and urine sampling were monitored at regular intervals for up to 6 months after starting dupilumab therapy.

Results Of the 31 patients included in the study, 30 completed both aspirin provocation tests. After 6 months of treatment with dupilumab, 23% of patients (n=7 of 30) developed complete aspirin tolerance and an additional 33% of patients (n=10 of 30) tolerated higher doses. Polyp burden was significantly reduced (total polyp score: −2.68±1.84, p<0.001), while pulmonary symptoms (asthma control test: +2.34±3.67, p<0.001) and olfactory performance improved (University of Pennsylvania Smell Identification Test: +11.16±9.54, p<0.001) in all patients after therapy. Patients with increased aspirin tolerance showed a significant decrease in urinary leukotriene E4 levels and their improvement in clinical parameters was associated with a reduction of eotaxin-1, C-C motif chemokine ligand 17, IL-5, IL-17A and IL-6.

Conclusion In this study, 57% of N-ERD patients tolerated higher doses of aspirin under dupilumab therapy.

This article has an editorial commentary: https://doi.org/10.1183/13993003.02467-2022

Received: 7 July 2022
Accepted: 14 Nov 2022