

LETTER



WILEY

Improvement of atopic dermatitis and IgA nephropathy in a patient treated by dupilumab

Dear Editor,

Atopic dermatitis is a chronic multifactorial inflammatory skin disease with a prevalence of 1% to 3% in adults and 15% to 20% in the world's pediatric population, that poses a significant burden on patients' quality of life.¹ In recent years, there has been increasing evidence of multiple comorbidities associated with atopic dermatitis including not only atopic conditions such as hay fever or asthma, but also ocular complications, cardiovascular and autoimmune diseases.²

Dupilumab is the first approved fully human monoclonal antibody for the treatment of moderate to severe atopic dermatitis. It blocks IL-4 receptor- α subunit, thereby inhibiting the signaling of both IL-4 and IL-13.³

We describe a case of a 31-year-old male patient who has suffered from severe atopic dermatitis since early childhood. At the age of 27, he presented to the nephrologist with a 3-year history of progressive microscopic hematuria, proteinuria and arterial hypertension. Kidney biopsy revealed the diagnosis of IgA nephropathy (IgAN)—the most common cause of primary (idiopathic) glomerulonephritis in the developed world.⁴

At the time of the diagnosis, his serum creatinine level (SCr) was 141 $\mu\text{mol/L}$, glomerular filtration rate (GFR) 1.31 ml/s/1.73 m^2 , microscopic hematuria 641 erythrocytes/ μL , and urinary protein/creatinine ratio (U-PCR) was 143 mg/mmol . The level of serum IgE was 12 500 IU/ml. Treatment with systemic corticosteroids (prednisone 40 mg) was initiated by the nephrologist.

Renal functions and microscopic hematuria were stabilized (SCr 104 $\mu\text{mol/L}$, GFR 1.36 ml/s/1.73 m^2 , 28 erythrocytes/ μL) but after tapering the steroids to the dose of 10 mg of prednisone, proteinuria increased (U-PCR 48 mg/mmol) and the atopic dermatitis worsened (EASI score 27.6). In the past, he had been treated for 2 years with methotrexate 15 mg/week for atopic dermatitis with only partial

effect; cyclosporine A was not suggested due the diagnosis of IgA nephropathy. We initiated treatment with dupilumab on the classical dose of 600 mg s.c. on baseline and then, 300 mg s.c. every 2 weeks. Eight weeks after dupilumab initiation, the patient achieved EASI75, his proteinuria normalized (U-PCR 8), SCr level decreased to 98 $\mu\text{mol/L}$, GFR was 1.51 ml/s/1.73 m^2 , IgE level dropped to 4570 IU/ml. (Table 1) The patient has currently been treated with dupilumab for 9 months. He is a EASI90 responder, his renal laboratory parameters remain improved, IgE level currently decreased to 3490 IU/ml and he is on a minimum dose of corticosteroids (prednisone 2.5 mg daily) which will be stopped in the next weeks.

Patients with atopic dermatitis have increased risk of various comorbidities, including glomerulonephritis.⁵ Serum levels of IgE often positively correlate with the severity of atopic dermatitis.⁶ Lee et al⁷ demonstrated that IgAN pathogenesis and progression was also potentially associated with serum IgE levels. Dupilumab therapy progressively and significantly reduces total IgE serum concentrations, something that we have also seen in our patient.^{8,9} This could be the explanation as to why renal functions improved after dupilumab therapy. IgE typically binds not only to mast cells and basophils but also to low-affinity receptors on inflammatory cells and platelets, with the release of inflammatory mediators and chemotactic factors, which have been thought to cause glomerulonephritis.¹⁰ Another explanation can be the suppression of systemic inflammation. Despite our patient being on corticosteroids for 2 years, the effect on atopic dermatitis and proteinuria was rather doubtful. Two months after initiation of dupilumab, he was a EASI75 responder, his IgE levels decreased by 63%, and proteinuria recovered.

More patients with IgAN and atopic dermatitis treated by dupilumab should be analyzed to conclude if lowering IgE level through dupilumab can have a positive effect on the course of IgAN

TABLE 1 Improvement of renal functions and total level of IgE in serum in a patient with IgA nephropathy treated with dupilumab for atopic dermatitis

	Creatinine ($\mu\text{mol/L}$)	GFR (1.48 ml/s/1.73 m^2)	Protein/creatinine ratio (g/mol)	EASI score	IgE in serum (IU/ml)
Before dupilumab therapy	141	1.31	53	27.6	12 500
After 8 weeks of dupilumab therapy	98	1.51	8	1.4	4570
After 9 months of dupilumab therapy	89	1.45	6	0.6	3490

but at least it seems that dupilumab therapy is safe for the patients with IgAN.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

All authors contributed equally to this study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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