



Original Article

Elevated serum immunoglobulin E level as a marker for progression of immunoglobulin A nephropathy



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Background: Immunoglobulin E (IgE) has traditionally been associated with anaphylaxis and atopic disease. Previous studies reported that serum IgE levels are elevated in nephrotic syndrome and suggested IgE levels as a prognostic indicator in glomerular diseases. The aim of this study was to explore the association between serum IgE levels and renal outcome in patients with immunoglobulin A nephropathy (IgAN).

Methods: We included 117 patients with biopsy-proven IgAN. Renal progression was defined if a patient meets one of these criteria: (1) a negative value of delta estimated glomerular filtration rate (mL/min/1.73 m²/mo) or (2) a rise in serum creatinine to an absolute level of ≥ 1.3 mg/dL (male) or 1.2 mg/dL (female). We defined delta changes in serum creatinine, estimated glomerular filtration rate, and proteinuria as a difference of values during the follow-up period.

Results: A total of 117 patients with IgAN were included. The serum IgE level was significantly high in the renal progressive group compared with the nonprogressive group. Sex and history of gross hematuria were significantly different between the high-IgE group and the low-IgE group. Regression analysis showed that a male sex, initial proteinuria, and change of proteinuria were significantly associated with serum IgE levels.

Conclusion: The serum IgE level is potentially associated with disease progression and pathogenesis of IgAN.

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Introduction

Immunoglobulin A nephropathy (IgAN), characterized by IgA deposition in glomerular mesangium, is the most common primary glomerulonephritis (GN) worldwide [1] and the leading cause of GN in some countries, such as Korea [2]. Recent studies have shown that 35–50% of these patients exhibit disease progression to end-stage kidney disease within

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30 years despite treatments [3]. According to the Kidney Disease: Improving Global Outcomes guideline of 2012, proteinuria, blood pressure, and kidney biopsy findings at presentation are associated with the risk of end-stage renal disease and the doubling of serum creatinine (SCr) levels [4]. Among these, proteinuria of >1 g/d is a powerful independent predictor of accelerated decline of renal function [5,6]. Although the pathologic analysis of renal biopsies is the standard for the diagnosis of IgAN, the measurement of novel biomarkers in serum might be regarded as an alternative tool, providing meaningful information for the diagnosis and prognosis of this glomerular disease [7–11].

Immunoglobulin E (IgE) has traditionally been associated with anaphylaxis and atopic diseases. IgE production is characteristic of not only allergy but also infection by parasitic worms. The highest levels of IgE are often associated with atopic dermatitis, followed by atopic asthma, perennial allergic rhinitis, and seasonal allergic rhinitis. Measurement of total IgE levels in patients with allergic bronchopulmonary aspergillosis can be used to monitor disease activity and response to therapy. Total serum IgE level has been found to be of clinical relevance in nephrotic syndrome, where elevated levels of serum IgE were regarded as a predictor of the disease [12–14]. However, the clinical significance has rarely been studied in IgAN. The aim of this study was to explore the association between the serum IgE level in IgAN patients and their renal outcome.

Methods

Study population and study design

This is an observational retrospective study of a cohort of IgAN patients undergoing kidney biopsies, between 1995 and 2012 (Fig. 1). All patients in this study were diagnosed at Kyung Hee Medical Center and Kyung Hee University Hospital at

Table 1. Patient characteristics

Parameters	
Number of patients	117
Sex (male)	67 (57.3)
Age (y)	33.4
BMI (kg/m ²)	23.1 ± 3.6
Smoking	20 (17.1)
HTN	23 (19.7)
Serum IgE (IU/mL)	304 ± 607
Serum IgA (mg/dL)	334 ± 157
Period of follow-up (mo)	39 ± 33
Hb (g/dL)	13.3 ± 2.0
Albumin (g/dL)	3.8 ± 0.7
Total cholesterol (mg/dL)	186 ± 64
Initial serum Cr (mg/dL)	1.3 ± 1.0
Initial eGFR (mL/min/1.73 m ²)	84.8 ± 37.4
Initial UPCR (g/gCr)	1.8 ± 2.7
Final serum Cr (mg/dL)	1.8 ± 3.2
Final eGFR (mL/min/1.73 m ²)	90.5 ± 42.0
Final proteinuria (g/gCr)	0.8 ± 1.2
Gross hematuria	27 (23.1)
Renal progression	17 (14.5)
Pathologic stage	
Stage I	29 (24.8)
Stage II	62 (53.0)
Stage III	19 (16.2)
Stage IV	6 (5.1)
Stage V	1 (0.9)

Data are presented as *n* (%) or mean ± SD.

BMI, body mass index; Cr, creatinine; eGFR, estimated glomerular filtration rate; Hb, hemoglobin; HTN, hypertension; IgA, immunoglobulin A; IgE, immunoglobulin E; UPCR, urine protein-to-creatinine ratio.

Gangdong. A total of 117 patients, 67 (57.3%) men and 50 (42.7%) women, with IgAN were included (Table 1). The median age at the time of renal biopsy was 33 years (range, 12–68 years). We collected the data of patients' demographics and serum IgE levels via routine laboratory examination.

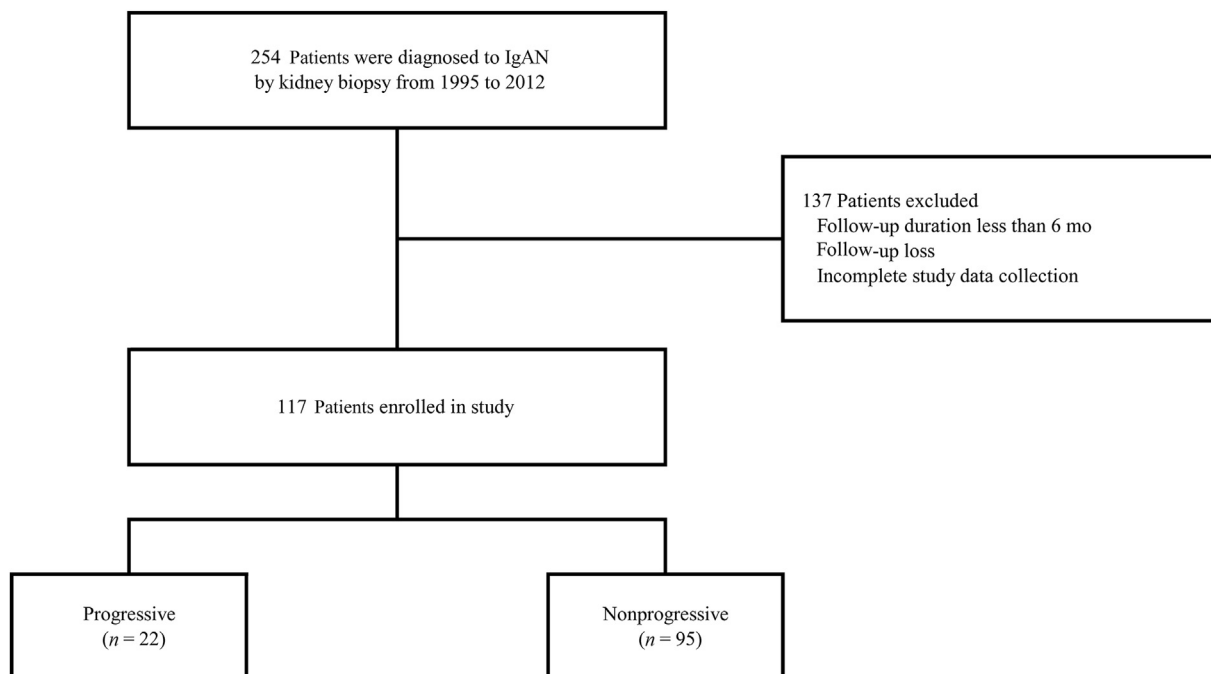


Figure 1. Study design and renal outcomes. IgAN, immunoglobulin A nephropathy.

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