Late-onset IgA vasculitis in adult patients exhibits distinct clinical characteristics and outcomes

S. Hong[1], S.M. Ahn[1], D.-H. Lim[1], B. Ghang[1], W.S. Yang[2], S.K. Lee[2], Y.-G. Kim[1], C.-K. Lee[1], B. Yoo[1]

[1]Division of Rheumatology and [2]Division of Nephrology, Department of Internal Medicine, University of Ulsan College of Medicine, Asan Medical Center, Seoul, Korea.

Seokchan Hong, MD, PhD
Soo Min Ahn, MD
Doo-Ho Lim, MD
Byeongzu Ghang, MD
Won Seok Yang, MD, PhD
Sang Koo Lee, MD, PhD
Yong-Gil Kim, MD, PhD
Chang-Keun Lee, MD, PhD
Bin Yoo, MD, PhD

Please address correspondence to:
Bin Yoo, MD, PhD,
Division of Rheumatology,
University of Ulsan College of Medicine,
Asan Medical Center,
88 Olympic-ro 43-gil,
Songpa-gu,
Seoul 05505, Korea.
E-mail:byoo@amc.seoul.kr

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ABSTRACT

Objective. *The aim of this study was to determine whether adult IgA vasculitis patients who developed the disease at an older age differ from early-onset patients in terms of clinical features and outcomes.*

Methods. *All consecutive adult patients who were diagnosed with IgA vasculitis between January 1997 and December 2014 were reviewed retrospectively. Patients who developed the disease at an older age (≥60 years; late-onset) were compared with those with an earlier onset of disease (<60 years; early-onset). Renal insufficiency was defined as an estimated glomerular filtration rate <60 ml/minute.*

Results. *In total, 100 adult patients were diagnosed with IgA vasculitis (mean age, 45.61 ± 17.24 years), of whom 31 (31%) had late-onset disease. Compared to early-onset patients, late-onset patients were less likely to have a preceding upper respiratory tract infection (0/31, 0.0% vs. 14/69, 20.3%; p=0.004), and more likely to have renal involvement at presentation (27/31, 87.1% vs. 43/69, 62.3%; p=0.017). At the last follow-up visit, late-onset patients were more likely to have chronic renal insufficiency, including end-stage renal disease (18/28, 64.3% vs. 7/62, 11.3%; p=0.000). Multivariate Cox analysis revealed that late-onset was a significant risk factor for renal insufficiency at follow-up (hazard ratio, 16.980, 95% confidence intervals, 4.380–65.830; p=0.000).*

Conclusion. *Patients with late-onset IgA vasculitis in adults exhibit distinct clinical features characterised by greater renal involvement and worse renal outcomes. Thus, watchful follow-up might be needed for adult IgA vasculitis patients, in particular those with late-onset disease.*

Introduction

IgA vasculitis (formerly called Henoch–Schönlein purpura) is an immune complex-mediated small-vessel vasculitis that is characterised by the involvement of the skin, joints, gastrointestinal (GI) tract, and kidneys (1). IgA vasculitis was usually considered to be a benign disease as its course is generally self-limited and resolves spontaneously. Thus, aggressive therapy, including with corticosteroids, is generally not required for IgA vasculitis (2, 3).

Although IgA vasculitis occurs much more frequently in children, usually before the age of 8 years, it can also develop in adults (4-8). Compared to children, adults have more severe disease and worse outcomes: several long-term follow-up cohort studies showed that up to 30% of adults with IgA vasculitis develop chronic renal insufficiency (9-11). However, little is known about whether an older age onset at IgA vasculitis among adult patients associates with different clinical characteristics and outcomes compared to when onset is earlier. Interestingly, a recent study of the Slovenian population showed that the incidence of adults with IgA vasculitis is highest in adults over the age of 60 years, which suggests that this disease has a bimodal distribution in the overall population in terms of age at onset (12). Given that late-onset disease in various autoimmune inflammatory diseases, including systemic lupus erythematosus (SLE), associates with distinct clinical features and outcomes compared to early-onset disease, comparison of the clinical characteristics of late- and early-onset IgA vasculitis in adults is warranted.

Therefore, the present retrospective cohort study was performed to compare patients with late- and early-onset IgA

vasculitis in terms of their clinical features and outcomes. The ability of various clinical factors, including late onset (≥60 years), to predict a poor prognosis in IgA vasculitis during follow-up was also assessed.

Patients and methods

The medical records of all consecutive patients who were older than 20 years and were diagnosed with IgA vasculitis in our tertiary referral hospital in Seoul, Korea between January 1997 and December 2014 were reviewed retrospectively. All patients fulfilled the European League against Rheumatism/Paediatric Rheumatology International Trials Organisation/Paediatric Rheumatology European Society (EULAR/PRINTO/PRES) criteria for IgA vasculitis (13). Patients (n=4) who lacked purpuric skin lesions, which is a mandatory feature for EULAR/PRINTO/PRES-based diagnosis of IgA vasculitis, but had other typical clinical features of IgA vasculitis, including pathological evidence in the kidney, were also included in the study cohort. The clinical characteristics at presentation were recorded. These included age, gender, laboratory data including serum erythrocyte sedimentation rate and C-reactive protein and IgA levels. The presence of known triggering factors such as upper respiratory tract infection (URI), drug use, vaccination, and insect bite, malignancy (pre-existing, diagnosed at the same time as IgA vasculitis, and diagnosed during follow-up within 1 year after diagnosis of IgA vasculitis), and renal insufficiency were also evaluated. Organ (skin, joint, GI, and kidney) involvement was addressed. Nephrotic-range proteinuria was defined as proteinuria >3.0 g/day. Haematuria was defined as the presence of ≥10 red blood cells per high-power field in urine analysis. Renal insufficiency was defined as an estimated glomerular filtration rate (eGFR) <60 ml/minute. eGFR was calculated by using the chronic kidney disease epidemiology collaboration (CKD-EPI) equation (14). The patients were divided into early-onset (age <60) and late-onset (age ≥60) groups according to age of disease onset.

In patients for whom follow-up data was available, disease outcome at the last follow-up, namely, recurrence, chronic renal insufficiency, including end-stage renal disease (ESRD), and death, was assessed. Clinical recurrence was defined as the re-appearance of the symptoms and signs of IgA vasculitis. ESRD was defined as the need for renal replacement therapy due to chronic renal insufficiency.

The two groups were compared in terms of continuous and categorical variables by using the Student's t-test and Fisher's exact test, respectively. The Mann–Whitney U-test was used when the continuous variable was expressed as median with interquartile (IQR) range. To determine which factors were predictive of the development of chronic renal insufficiency, univariate analyses were performed using Fisher's exact test. After identifying potential risk factors by univariate analysis, those with *p*-values <0.20 were included into multivariable Cox-regression analysis with a stepwise selection method. The results were expressed as hazard ratio (HR) with 95% confidence intervals (CI). During follow-up, the cumulative probabilities of developing renal insufficiency or ESRD were determined by using the Kaplan-Meier method. The two groups were compared in terms of these curves by using the log-rank test. *P*-values <0.05 were considered to indicate statistical significance. All statistical analyses were performed by using SPSS software (v. 21.0; SPSS Inc., Chicago, Illinois, USA).

Results

Characteristics of the whole study cohort

In total, 100 adult patients with IgA vasculitis were identified. The clinical characteristics of these patients at presentation are shown in Table I. Their mean age was 45.6±17.2 years, equal numbers of men and women were involved, and 31 and 69 had late- and early-onset disease, respectively, according to their age of disease onset. The majority (75%) of patients lacked preceding factors for the disease. Eight patients had a malignancy either before or after the diagnosis of IgA vasculitis.

Table I. Clinical characteristics of the whole adult IgA vasculitis cohort at presentation.

Characteristic, n (%) or mean ± SD	Total (n=100)
Age, years	45.61 ± 17.24
Older age (≥60 years)	31 (31.0%)
Gender, Male/Female	50/50
Preceding factors	
URI	14
Drugs	11
Vaccination	1
Inset bite	2
Unknown	75
Malignancy*	8
Fever	14
Skin involvement	
Upper extremities	32
Lower extremities	96
Gastrointestinal involvement	
Abdominal pain	67
Diarrhoea	41
Melena/haematochezia	26
Joint involvement	
Arthralgia	43
Arthritis	28
Kidney involvement	70
Haematuria¥	67
Proteinuria (>1 g/day)	48
Nephrotic proteinuria (>3 g/day)	21
Renal insufficiency†	21
ESR, mm/h	32.02 ± 24.00
CRP, mg/dL	4.11 ± 5.44
Creatinine, mg/dL	1.21 ± 1.15
IgA, mg/dL	346.87 ± 164.90
Hypertension	24
Diabetes	7
Treatment	66
Corticosteroid	66
Azathioprine	14
Cyclophosphamide	14

*Malignancy included pre-existing malignancy at presentation, malignancy diagnosed at the same time as IgA vasculitis, and malignancy that developed during follow-up within 1 year after diagnosis of IgA vasculitis.
¥Haematuria was defined as ≥10 red blood cells per high-power field in urine analysis.
†Renal insufficiency was defined as an estimated glomerular filtration rate <60 mL/minute.
CRP: C-reactive protein; ESR: erythrocyte sedimentation rate; URI: upper respiratory tract infection.

Three of these were diagnosed with cancer and IgA vasculitis at the same time. GI involvement was documented in 67 patients: it presented most commonly as abdominal pain (67%), followed by diarrhoea (41%) and melena/haematochezia (26%). At the time of diagnosis, 70 (70%) patients showed kidney involvement, that is, haematu-

ria (67%) and proteinuria (48%), and 21 (21%) exhibited renal insufficiency. In total, 66 patients were treated with moderate to high doses of corticosteroids. Concomitant immunosuppressants (azathioprine, 14 patients; cyclophosphamide, 14 patients) were administered in some cases.

Comparison of the late- and early-onset IgA vasculitis groups in terms of characteristics at presentation

The early- (n=69) and late-onset (n=31) groups were similar in terms of gender distribution (p=0.666), but only the early-onset group had the triggering factor of URI at diagnosis (14/69, 20.3% *vs*. 0/31, 0.0%; p=0.004) (Table II). By contrast, the late-onset patients were more likely than the early-onset patients to lack a known preceding factor (27/31, 87.1% *vs*. 48/69, 69.6%), although this did not reach statistical significance (p=0.081). Interestingly, the late-onset group was more likely to have a malignancy at the time of diagnosis or later than the early-onset group (6/31, 19.4% *vs*. 2/69, 2.9%; p=0.010). The two groups did not differ in terms of frequency of skin, GI, or joint involvement. However, patients with late-onset disease were more likely to have renal involvement at presentation. Specifically, the late-onset group was more likely to have haematuria (26/31, 83.9% *vs*. 41/69, 59.4%; p=0.021), proteinuria (20/31, 64.5% *vs*. 28/69, 40.6%; p=0.032), and renal insufficiency (14/31, 45.2% *vs*. 7/69, 10.1%; p=0.000), but not nephrotic-range proteinuria (p=0.196). The patients with late-onset disease were also more likely to have hypertension (15/31, 48.4% *vs*. 9/69, 13.0%; p=0.000) and diabetes (5/31, 16.1% *vs*. 2/69, 2.9%; p=0.028) at presentation. The two groups did not differ in terms of need for corticosteroids and/or immunosuppressive drugs, including azathioprine or cyclophosphamide.

Data in the follow-up period were available for about 90% of both groups (62/69 early-onset and 28/31 late-onset patients) (Table III). The median follow-up durations of the early- and late-onset groups were 35.6 (IQR, 10.0–85.3) and 24.7 (IQR, 2.8–58.1)

Table II. Comparison of patients with early- and late-onset IgA vasculitis in terms of characteristics at presentation.

Characteristic, n (%) or mean ± SD	Early-onset (n=69)	Late-onset (n=31)	p-value
Age, years	36.64 ± 12.73	65.58 ± 4.10	**0.000**
Gender, Male/Female	33/36	17/14	0.666
Preceding factors			
URI	14 (20.3)	0 (0.0)	**0.004**
Drugs	9 (13.0)	2 (6.5)	0.495
Vaccination	0 (0.0)	1 (3.2)	0.310
Inset bite	1 (1.4)	1 (3.2)	0.526
Unknown	48 (69.6)	27 (87.1)	0.081
Malignancy*	2 (2.9)	6 (19.4)	**0.010**
Fever	12 (17.4)	2 (6.5)	0.215
Skin involvement			
Upper extremities	24 (34.8)	8 (25.8)	0.488
Lower extremities	66 (95.7)	30 (96.8)	1.000
Gastrointestinal involvement			
Abdominal pain	44 (63.8)	23 (74.2)	0.363
Diarrhea	27 (39.1)	14 (45.2)	0.662
Melena/haematochezia	15 (21.7)	11 (35.5)	0.217
Joint involvement			
Arthralgia	33 (47.8)	10 (32.3)	0.191
Arthritis	21 (30.4)	7 (22.6)	0.478
Kidney involvement	43 (62.3)	27 (87.1)	**0.017**
Haematuria¥	41 (59.4)	26 (83.9)	**0.021**
Proteinuria (>1 g/day)	28 (40.6)	20 (64.5)	**0.032**
Nephrotic proteinuria (>3 g/day)	12 (17.4)	9 (29.0)	0.196
Renal insufficiency†	7 (10.1)	14 (45.2)	**0.000**
ESR, mm/h	31.15 ± 26.66	33.83 ± 17.52	0.573
CRP, mg/dL	3.41 ± 5.33	5.52 ± 5.47	0.098
Creatinine, mg/dL	0.92 ± 0.66	1.87 ± 1.66	**0.000**
IgA, mg/dL	344.09 ± 122.37	353.10 ± 237.89	0.837
Hypertension	9 (13.0)	15 (48.4)	**0.000**
Diabetes	2 (2.9)	5 (16.1)	**0.028**
Treatment	44 (63.8)	22 (71.0)	0.649
Corticosteroid	44 (63.8)	22 (71.0)	0.649
Azathioprine	11 (15.9)	3 (9.7)	0.540
Cyclophosphamide	7 (10.1)	7 (22.6)	0.122

*Malignancy included pre-existing malignancy at presentation, malignancy diagnosed at the same time as IgA vasculitis, and malignancy that developed during follow-up within 1 year after diagnosis of IgA vasculitis.

¥Haematuria was defined as ≥10 red blood cells per high-power field in urine analysis.

†Renal insufficiency was defined as an estimated glomerular filtration rate <60 mL/minute.

p-values were obtained by comparing the early- and late-onset groups by Student's t-test or chi-squared test, as appropriate.

CRP: C-reactive protein; ESR: erythrocyte sedimentation rate; URI: upper respiratory tract infection.

Table III. Comparison of patients with early- and late-onset IgA vasculitis in outcome at the last follow-up.

	Early-onset (n=62)	Late-onset (n=28)	p-value
Follow-up duration, months*	35.6 (10.0–85.3)	24.7 (2.8–58.1)	0.067
Recurrence, n (%)	14 (22.6)	3 (10.7)	0.254
Chronic renal insufficiency, n (%)¥	7 (11.3)	18 (64.3)	**0.000**
Death, n (%)†	0 (0.0)	5 (17.9)	**0.002**

*Median (interquartile range).

¥Renal insufficiency was defined as an estimated glomerular filtration rate <60 mL/minute.

†Causes of death: infection (pneumonia) (n=2), gastrointestinal bleeding (n=2), and cancer (n=1).

p-values were generated by comparing the early- and late-onset groups by Mann-Whitney U test or chi-squared test, as appropriate.

Table IV. Factors related to chronic renal insufficiency in patients with adult IgA vasculitis, as measured by univariate analysis.

Characteristic, n (%)	Patients without chronic renal insufficiency* (n=65)	Patients with chronic renal insufficiency* (n=25)	*p*-value
Late onset	10 (15.4)	18 (72.0)	**0.000**
Gender, Male/Female	30/35	15/10	0.347
Preceding factors			
URI	13 (20.0)	0 (0.0)	**0.016**
Drugs	8 (12.3)	3 (12.0)	1.000
Vaccination	0 (0.0)	1 (4.0)	0.278
Inset bite	1 (1.5)	1 (4.0)	0.481
Unknown	46 (70.8)	20 (80.0)	0.436
Malignancy¥	4 (6.2)	3 (12.0)	0.392
Kidney involvement at presentation			
Haematuria†	40 (61.5)	24 (96.0)	**0.001**
Proteinuria (>1 g/day)	27 (41.5)	18 (72.0)	**0.018**
Nephrotic proteinuria (>3 g/day)	14 (21.5)	6 (24.0)	0.784
Renal insufficiency	5 (7.7)	15 (60.0)	**0.000**
Elevated ESR at presentation¶	43/58 (74.1)	23/24 (95.8)	**0.031**
Elevated CRP at presentation**	39/55 (70.9)	18/22 (81.8)	0.399
Elevated IgA at presentation$	7/42 (16.7)	9/19 (47.4)	**0.025**
Hypertension at presentation	13 (20.0)	9 (36.0)	0.169
Diabetes at presentation	3 (4.6)	4 (16.0)	0.090
Treatment			
Corticosteroid	46 (70.8)	16 (64.0)	0.614
Azathioprine	9 (13.8)	5 (20.0)	0.522
Cyclophosphamide	8 (12.3)	6 (24.0)	0.200

*Renal insufficiency was defined as an estimated glomerular filtration rate <60 mL/minute.
¥Malignancy included pre-existing malignancy at presentation, malignancy diagnosed at the same time as IgA vasculitis, and malignancy that developed during follow-up within 1 year after diagnosis of IgA vasculitis.
†Haematuria was defined as ≥10 red blood cells per high-power field in urine analysis; ¶Defined as ESR >9 mm/h in male, >20 mm/h in female; **Defined as CRP >0.6 mg/dl; $Defined as IgA >400 mg/dl.
CRP: C-reactive protein; ESR: erythrocyte sedimentation rate; URI: upper respiratory tract infection.

Table V. Clinical factors that predict the development of chronic renal insufficiency, as measured by multivariate analysis.

	HR	95% CI	*p*-value
Elevated ESR at presentation*	0.749	0.085–6.569	0.794
Hypertension at presentation	0.642	0.249-1.652	0.358
Haematuria at presentation¥	9.617	1.171–78.997	**0.035**
Late-onset disease (≥60 years)	16.980	4.380–65.830	**0.000**

*Defined as ESR >9 mm/h in male, >20 mm/h in female.
¥Haematuria was defined as ≥10 red blood cells per high-power field in urine analysis.
CI: confidence interval; HR: hazard ratio.

months, respectively. The early- and late-onset groups did not differ in disease recurrence rates (14/62, 22.6% *vs*. 3/28, 10.7%; *p*=0.254), but the late-onset group was significantly more likely to have chronic renal insufficiency, including ESRD (n=1), at the last follow-up visit (18/28, 64.3% *vs*. 7/62, 11.3%; *p*=0.000). During follow-up, five patients died. All had late-onset IgA vasculitis (*p*=0.002 *vs*. early-onset disease). The causes of death were as follows: infection (2/5, 40.0%), GI bleeding (2/5, 40.0%), and cancer (1/5, 20.0%).

Variables related to renal outcome in adult IgA vasculitis

The baseline parameters were analysed to assess which variables were significantly related to poor renal outcome (that is, chronic renal insufficiency, including ESRD, at the last follow-up visit) in patients with IgA vasculitis (Table IV). In univariate analysis, late-onset, preceding URI, haematuria, proteinuria (>1.0 g/day), renal insufficiency at initial presentation, elevated ESR values, and elevated IgA levels were found to be associated with the development of chronic renal insufficiency. Further, we performed multivariate analysis using Cox proportional hazards models to determine which baseline clinical factors, including late-onset disease, are independent significant risk factors for poor renal outcome in IgA vasculitis (Table V). Elevated ESR levels and hypertension at initial presentation did not associate significantly with poor renal outcome (HR 0.749, 95% CI=0.085-6.569; *p*=0.794 and HR 0.642, 95% CI=0.249-1.652; *p*=0.358, respectively). Potential confounding factors such as diabetes and acute renal insufficiency at presentation were excluded during the stepwise selection process. However, haematuria at presentation was significantly associated with chronic renal insufficiency/ESRD at the last follow-up visit (HR 9.617, 95% CI=1.171–78.997; *p*=0.035). Notably, late-onset disease was significantly associated with an increased risk of development of chronic renal insufficiency in adult patients with IgA vasculitis (HR 16.980, 95% CI=4.380–65.830; *p*=0.000). Finally, Kaplan–Meier analysis showed that late-onset patients had a significantly higher probability of having chronic renal insufficiency at follow-up than early-onset patients (*p*=0.000; Fig. 1).

Discussion

The present study showed that there were marked differences between adult patients with early- and late-onset IgA vasculitis in terms of clinical characteristics and outcomes. Late-onset disease was associated more frequently with renal involvement, diabetes, and hypertension at presentation and with malignancy that was present at presentation or developed later. Patients with late-onset disease were also more likely to have chronic renal insufficiency at follow-up and to have death than patients with early-onset disease. Late-

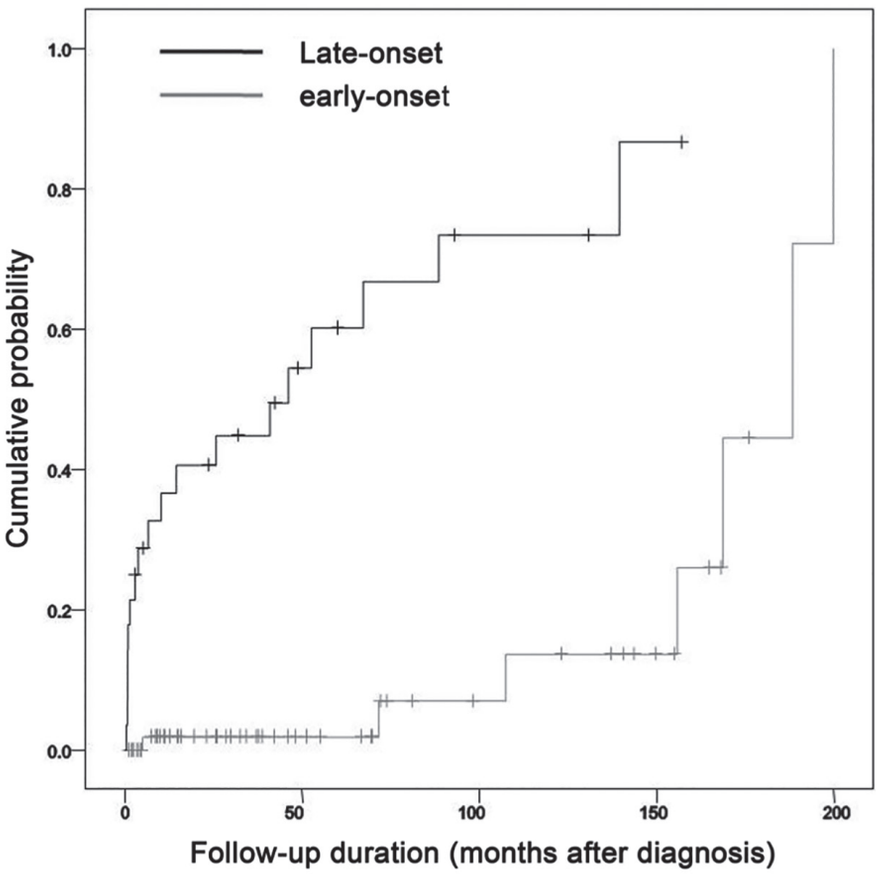

Fig. 1. Comparison of early- and late-onset adult IgA vasculitis patients in the cumulative probability of the development of chronic renal insufficiency (p=0.000).

onset disease was a significant independent prognostic factor for chronic renal insufficiency at follow-up.

While the exact aetiology of IgA vasculitis remains unknown, it is clear that it often follows certain triggering events. Infection in the upper respiratory tract is a particularly common cause of IgA vasculitis (2, 3). In this context, it is interesting that IgA, which is primarily responsible for protection from mucosal infection, plays a pivotal role in the pathogenesis of IgA vasculitis (15). How IgA responses in mucosal tissue could drive the development of systemic vasculitis and whether certain factors affect disease presentation and clinical outcome warrant further investigation. Intriguingly, we found that a possible aetiology of URI was identified only in the early-onset patients, but not in the late-onset patients (Table II). Moreover, further analysis of the 14 early-onset patients with a preceding URI revealed that all 13 who were followed up resolved the disease without any renal sequelae. This suggests that certain aetiological factors associate with different outcome. This may explain why IgA vasculitis in adulthood associates with more severe outcomes than disease in children since the previous URI is less common in adult IgA vasculitis (4-7). In this regard, it suggests that cancer, which was much more common in late-onset patients, was partly responsible for the worse outcome in this patient group, although the causative role of cancer in IgA vasculitis remains largely unknown.

In agreement with previous studies (9-11), our present study showed that adult patients with IgA vasculitis frequently presented with renal involvement. At initial presentation, 21.0% (21/100) of total subjects and 45.2% (14/31) of late-onset patients had renal function impairment, indicating that renal involvement was severe in substantial portions of patients at the time of diagnosis, in particular in patients with old age onset. Interestingly, in our present study, haematuria at presentation was found to be a significant risk for development of chronic renal insufficiency, which was consistent with a previous study (16). Further, late-onset of disease was significantly associated with poor renal outcome in adult IgA vasculitis. Certainly, confounding risk factors for poor renal outcome including hypertension and diabetes were more commonly found in patients with old age. However, we found that late-onset was the most important independent risk factor for the development of chronic renal insufficiency at the last follow-up after adjusting for other prognostic factors (HR=16.980, p=0.000; Table V). Furthermore, five late-onset patients died during follow-up compared to none of the early-onset patients. Of these deaths, two were caused by severe GI bleeding that related to vasculitis involvement. These observations suggest that late-onset adult patients are particularly likely to have severe organ involvement, eventually affecting the outcomes of IgA vasculitis.

The proper treatment for IgA vasculitis has not been established, particularly for subjects with severe renal involvement. A previous study showed that cyclophosphamide treatment does not have beneficial effects on the outcomes of adult IgA vasculitis (17). Similarly, in our study, patients who were and were not treated with cyclophosphamide did not differ in terms of development of chronic renal insufficiency at follow-up (data not shown). Notably, the cause of death in two of the five late-onset patients who died was infection such as pneumonia, possibly associated with immunosuppressive therapy. This suggests that the benefit that is provided by immunosuppressants must be weighed up against their possible deleterious effects, particular in older patients.

It was reported that renal pathology, including glomerular sclerosis and interstitial fibrosis, is of prognostic value in IgA vasculitis (10, 11). Thus, a major limitation of the present study was that renal biopsies were only performed in a few patients (7/100 patients, 7.0%), which prevented meaningful analy-

sis of renal pathology data. There is, however, a lack of consensus regarding which histological criteria are most useful for predicting the prognosis of patients with IgA vasculitis. Therefore, further studies assessing whether renal biopsy should be performed in patients with late-onset IgA vasculitis to identify patient subsets who may, or may not, benefit from therapy because older patients are more likely to have chronic renal insufficiency and possibly higher rates of adverse events in immunosuppressive therapy.

It can be challenging to diagnose IgA vasculitis in adults, particularly when biopsy is not feasible. Although, several classification criteria have been proposed for IgA vasculitis, these were originally developed for pediatric patients (18, 19). Recently, EULAR/PRINTO/PRES suggested new criteria for the classification of IgA vasculitis, but this criteria was not validated in adults (13). In addition, recent studies have shown that these classification criteria have low concordance between them, indicating needs for further efforts to define this complex disease (20, 21). Therefore, one of the major concerns in the present study was the possibility of misdiagnosis for IgA vasculitis in adult patients. Considering relatively poor prognosis, attempts for more definite diagnosis of IgA vasculitis are required for adult patients.

The severity as well as the susceptibility of the disease could be conferred by genetic predisposition. Previous studies have shown an association between certain genetic polymorphisms including IL-1 and IL-8 with the development of renal manifestations and renal sequelae in IgA vasculitis (22-24). Certainly, further studies are required to address the association between certain genetic factors and worse prognosis, in particular, in adult patients with old age onset.

To date, several studies on various autoimmune diseases have compared the early- and late-onset groups in terms of clinical features (25-27). It is well known that patients who develop autoimmune disease at an older age have distinct phenotypes, including baseline clinical characteristics and outcomes, compared to early-onset patients. For example, patients with late-onset SLE were more likely to have neurological, but less renal involvement and fewer anti-DNA antibodies (27). These findings suggest that the underlying pathogenesis of diseases differs depending on whether the disease develops early or late in life. Indeed, although the definition of the late-onset disease is arbitrary and different definitions have been used in different studies, a recent study showed that the incidence of adults with IgA vasculitis is highest in patients over the age of 60 years, indicating bimodal distribution of adults IgA vasculitis in terms of age at onset (12). Similarly, the fact that early- and late-onset IgA vasculitis differed in terms of clinical characteristics and outcomes suggests that IgA vasculitis may consist of different disease subtypes.

In conclusion, the current study showed that a substantial portion of patients who were diagnosed with IgA vasculitis were older (≥60 years). These patients were significantly more likely to have renal involvement, both at presentation and at the last follow-up, compared to early-onset patients. These findings suggest that careful follow-up with more intensive treatment might be needed for adult patients with late-onset IgA vasculitis.

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