Clinical burden of IgA nephropathy (IgAN) in the US: a retrospective electronic medical record (EMR) and claims analysis

Poster TH-PO616

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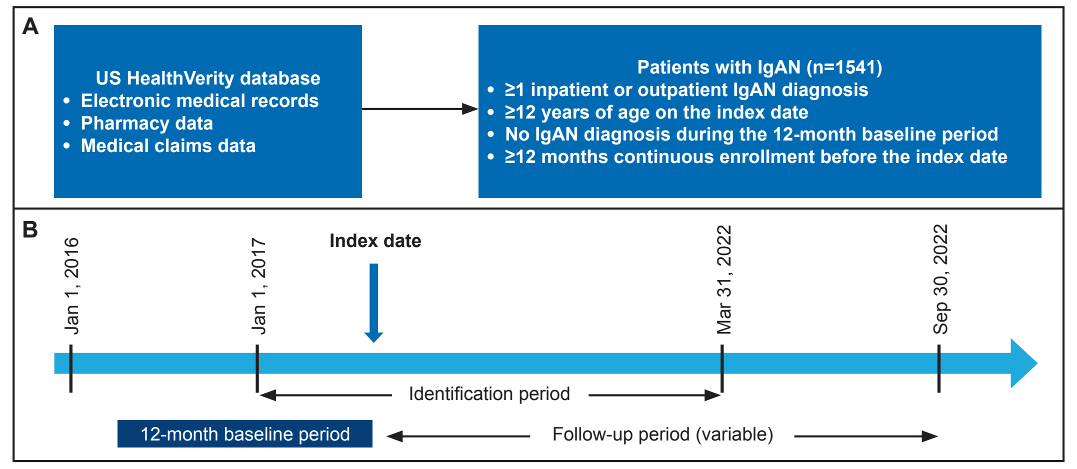
Introduction

- IgAN is the most common glomerulonephritis, with an estimated annual incidence of 1.29 per 100,000 persons in the US[1,2]
- IgAN is caused by the deposition of IgA-containing immune complexes in the glomeruli, which activates the complement system, leading to inflammation and glomerular damage[2,3]
- Patients with IgAN exhibit a highly variable risk of disease progression to kidney failure[4,5]
  - Rates of progression to kidney failure within 10 years of disease presentation vary and can be up to 50%
- There is currently no consensus on the optimal treatment for IgAN[6]
  - Supportive care for IgAN typically includes ACEi and ARBs
- There is a lack of real-world evidence regarding the burden of disease and unmet needs in patients with IgAN in US cohorts
- In this analysis, we present the demographics and clinical characteristics of a real-world cohort of US patients with IgAN and estimate the proportion of patients at high risk of disease progression despite treatment with supportive care

Methods

- This was a retrospective cohort study of patients with IgAN with EMRs and linked pharmacy and medical claims data in the US HealthVerity database between January 1, 2016 and September 30, 2022 (**Figure 1**)
  - Patients with IgAN were identified between January 1, 2017 and March 31, 2022
  - The index date was defined as the date of the first IgAN SNOMED diagnosis code
  - The baseline period was defined as the 12-month period before the index date
  - The follow-up period was variable
- Included patients were ≥12 years of age at the index date with ≥1 inpatient or outpatient diagnosis for IgAN, who had been in the database for ≥12 months continuously before the index date, and who had no record of an IgAN diagnosis during the baseline period
- Descriptive statistics were used to summarize demographic and clinical characteristics at the index date. Continuous variables were presented as mean ± SD, and categorical variables were presented as counts and percentages
- Patients at high risk of IgAN progression were defined as having proteinuria ≥1.0 g/g despite receiving supportive care
  - Supportive care was defined as ≥1 record of ACEi and/or ARBs, with or without SGLT2i, used within 12 months post-index date and for ≥90 days

Figure 1. Study design



A

US HealthVerity database
- Electronic medical records
- Pharmacy data
- Medical claims data

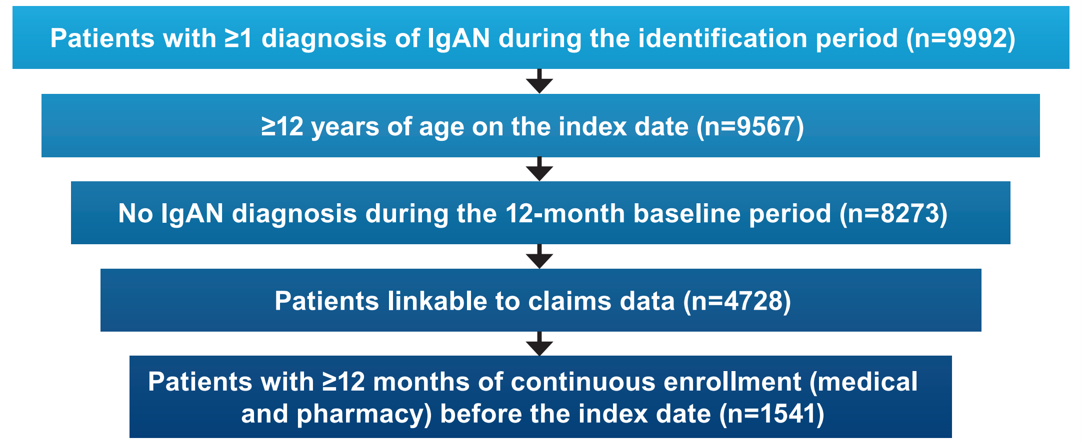
Patients with IgAN (n=1541)
- ≥1 inpatient or outpatient IgAN diagnosis
- ≥12 years of age on the index date
- No IgAN diagnosis during the 12-month baseline period
- ≥12 months continuous enrollment before the index date

A. Patients with IgAN were identified from the US HealthVerity database based on EMRs and linked pharmacy and medical claims data. **B.** Study timeline.
EMR, electronic medical record; IgAN, IgA nephropathy.

Results

- Among 9992 patients with ≥1 diagnosis of IgAN during the identification period, 1541 patients met the criteria for the study (**Figure 2**)

Figure 2. Selection of patients in the US HealthVerity database



Patients with ≥1 diagnosis of IgAN during the identification period (n=9992)

≥12 years of age on the index date (n=9567)

No IgAN diagnosis during the 12-month baseline period (n=8273)

Patients linkable to claims data (n=4728)

Patients with ≥12 months of continuous enrollment (medical and pharmacy) before the index date (n=1541)

IgAN, IgA nephropathy; US, United States.

Demographics and clinical characteristics

- Demographics and clinical characteristics of the 1541 patients included in the analysis, as well as those of the subgroups on supportive therapy with known progression status, are summarized in **Table 1**
  - The mean ± SD follow-up time from the index date for the overall population was 27.5 ± 18.4 months
- The mean ± SD age of patients was 43.8 ± 14.5 years and 53.0% of patients were male
- Of the 1077 patients with known CKD staging, 580 (53.9%) had stage 3–5 CKD
- Mean ± SD eGFR was 69.6 ± 33.7 mL/min/1.73 m² and mean ± SD proteinuria was 1.5 ± 1.6 g/g

Conclusions

- **Despite a relatively young mean age, comorbidities were common among this real-world cohort of patients with IgAN, identified using linked EMR and administrative claims data**
- **Approximately half of the included patients were receiving ACEi or ARBs (with or without SGLT2i) within 12 months of diagnosis**
- **Among patients with proteinuria, approximately half remained at high risk of progression at 6 months**
- **Patients at high risk of progression were predominantly female and had a high prevalence of hypertension**
- **IgAN exhibits a significant clinical burden in a relatively young population, highlighting the need for novel therapies**

- Overall, 28 patients (1.8%) had previously undergone a kidney transplant
- The most common comorbidities were hypertension (62.5%) and type 2 diabetes (13.8%)

Patients with supportive therapy

- Treatment patterns in patients with IgAN are summarized in **Table 2**
- Overall, 814 patients (52.8%) received ACEi or ARB therapy, and 24 patients (1.6%) received SGLT2i therapy within the patient-specific continuous enrollment period

Patients at risk of progression

- Of the 173 patients with proteinuria data available at 6 ± 3 months after treatment initiation, 75 patients (43.4%) were at high risk of disease progression (proteinuria ≥1.0 g/g) (**Table 3**)
- Of the 140 patients with proteinuria data available at 12 ± 3 months after treatment initiation, 43 patients (30.7%) were at high risk of disease progression (**Table 3**)
- Among the 75 patients at high risk of progression at 6 ± 3 months after treatment initiation, the mean ± SD age was 44.6 ± 12.0 years, and 44.0% of patients were male (**Table 1**)
  - Of the 70 patients with known CKD staging, 47 (67.1%) had stage 3–5 CKD
  - During baseline, mean ± SD eGFR was 60.4 ± 33.9 mL/min/1.73 m² and mean ± SD proteinuria was 2.4 ± 1.7 g/g
  - The most common comorbidities were hypertension (88.0%) and type 2 diabetes (14.7%)

Table 1. Demographics and clinical characteristics of patients with IgAN

		Patients with known progression status*	
Category	Patients with IgAN N=1541	High risk of progression n=75	Not high risk of progression n=98
Age at index date, years			
Mean (SD)	43.8 (14.5)	44.6 (12.0)	41.1 (13.0)
<18 years, n (%)	57 (3.7)	0	3 (3.1)
≥18 years, n (%)	1484 (96.3)	75 (100.0)	95 (96.9)
Sex, n (%)			
Female	724 (47.0)	42 (56.0)	46 (46.9)
Male	817 (53.0)	33 (44.0)	52 (53.1)
Payer type, n (%)			
Commercial	1146 (74.4)	57 (76.0)	82 (83.7)
Commercial (Medicaid)	23 (1.5)	0	3 (3.1)
Commercial (Medicare Advantage)	1 (0.1)	0	0
Medicaid	300 (19.5)	17 (22.7)	9 (9.2)
Medicaid (Medicare Advantage)	1 (0.1)	0	0
Medicare Advantage	57 (3.7)	1 (1.3)	3 (3.1)
Unknown	13 (0.8)	0	1 (1.0)
Comorbidities, n (%)			
Hypertension	963 (62.5)	66 (88.0)	67 (68.4)
Type 2 diabetes	212 (13.8)	11 (14.7)	14 (14.3)
Myocardial infarction	28 (1.8)	1 (1.3)	0
Congestive heart failure	68 (4.4)	3 (4.0)	3 (3.1)
Atrial fibrillation	38 (2.5)	1 (1.3)	1 (1.0)
CKD stage, n (%)			
Stage 1	275 (25.5)	15 (21.4)	27 (33.3)
Stage 2	222 (20.6)	8 (11.4)	16 (19.8)
Stage 3	188 (17.5)	17 (24.3)	16 (19.8)
Stage 3a	70 (6.5)	4 (5.7)	7 (8.6)
Stage 3b	73 (6.8)	12 (17.1)	8 (9.9)
Stage 4	127 (11.8)	9 (12.9)	7 (8.6)
Stage 5	122 (11.3)	5 (7.1)	0
Unknown	464 (30.1)	5 (6.7)	17 (17.3)
Unspecified†	33 (7.1)	1 (20.0)	2 (11.8)
Source of CKD staging,‡ n (%)			
eGFR	539 (50.0)	38 (54.3)	53 (65.4)
ICD-10	538 (50.0)	32 (45.7)	28 (34.6)
eGFR, mL/min/1.73 m²			
n (%)	764 (49.6)	59 (78.7)	69 (70.4)
Mean (SD)	69.6 (33.7)	60.4 (33.9)	74.4 (34.7)
Proteinuria, g/g			
n (%)	418 (27.1)	49 (65.3)	72 (73.5)
Mean (SD)	1.5 (1.6)	2.4 (1.7)	1.1 (1.2)
Hematuria, erythrocytes per HPF			
n (%)	45 (2.9)	2 (2.7)	2 (2.0)
Mean (SD)	2.4 (6.0)	0	3.5 (4.9)
Prior kidney transplant status, n (%)			
Present	28 (1.8)	75 (100.0)	97 (99.0)
Absent	1513 (98.2)	0	1 (1.0)
Extrarenal manifestations, n (%)			
Pulmonary hemorrhage	8 (0.5)	1 (1.3)	0
Ocular hemorrhage or retinal occlusion	10 (0.6)	0	1 (1.0)

Data are from the baseline period, unless otherwise stated.
*Patients were receiving supportive therapy; †Percentage calculated out of CKD unknown population;
‡Percentage calculated out of known value for CKD staging.
CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; HPF, high power field;
ICD, International Classification of Diseases; IgAN, IgA nephropathy; SD, standard deviation.

Table 2. Proportion of patients with IgAN treated with supportive therapy during the baseline period

	Patients with IgAN N=1541
Patients with supportive therapy, n (%)	
ACEi	453 (29.4)
ARB	407 (26.4)
ACEi or ARB*	814 (52.8)
SGLT2i	24 (1.6)

*With or without SGLT2i.
ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker; IgAN, IgA nephropathy;
SGLT2i, sodium-glucose cotransporter-2 inhibitor.

Table 3. Patients at high risk of disease progression despite treatment with supportive therapy

	Patients with IgAN on supportive therapy* n=814
Proteinuria data available 6 ± 3 months after treatment initiation,† n (%)	**173 (21.3)**
<1.0 g/g	98 (56.6)
≥1.0 g/g	75 (43.4)
≥1.5 g/g	58 (33.5)
Proteinuria data available 12 ± 3 months after treatment initiation,‡ n (%)	**140 (17.2)**
<1.0 g/g	97 (69.3)
≥1.0 g/g	43 (30.7)
≥1.5 g/g	29 (20.7)

*Treated with ACEi or ARB ± SGLT2i within 12 months post-index date; †The earliest date of treatment initiation ≤12 months post-index date within the continuous enrollment was utilized. The proteinuria value closest to the date of the first treatment plus 6 months was captured. The proteinuria value must have been within 3–9 months after the first treatment date and within the patient's continuous enrollment; ‡The earliest date of treatment initiation ≤12 months post-index date within the continuous enrollment was utilized. The proteinuria value closest to the date of the first treatment plus 12 months was captured. The proteinuria value must have been within 9–15 months after the first treatment date and within the patient's continuous enrollment.
ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker; IgAN, IgA nephropathy;
SGLT2i, sodium-glucose cotransporter-2 inhibitor.

Limitations

- As with all EMR-based studies, the diagnosis codes and data recorded in the database may be subject to human or technical error or data omission
- Patients may have multiple insurers, which may not be included in the database; thus, claims data may not convey all covered services, resulting in an underestimate of the treatment patterns
- The US HealthVerity database may be limited in scope as it only includes individuals who have interacted with the medical system or have insurance. As such, these data may not be representative of the entire population
- With this limited scope, the incidence calculations are only among those who have generated claims within this specific population and may not be representative of the true incidence in the general population

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Abbreviations

ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; EMR, electronic medical record; HPF, high power field; ICD, International Classification of Diseases; IgAN, IgA nephropathy; SD, standard deviation; SGLT2i, sodium-glucose cotransporter-2 inhibitor; SNOMED, Systematic Nomenclature of Medicine; US, United States.

Disclosures

BN, **CA**, **JN**, and **SO** are employees of Novartis Pharmaceuticals Corporation, East Hanover, New Jersey, USA. **EN**, **MB**, and **DG** are employees of Genesis Research LLC, Hoboken, New Jersey, USA.

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