The patient journey for immunoglobulin A nephropathy: diagnostic delay and change in kidney function from first clinical sign

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Introduction: Immunoglobulin A nephropathy (IgAN) commonly presents with hematuria and/or proteinuria; a biopsy is required to confirm diagnosis. This study described time from first clinical sign to biopsy confirmed diagnosis of IgAN and change in kidney function during this period.

Methods: Adult patients receiving care between Jan 2004 and Feb 2021 with a kidney biopsy confirmed diagnosis of IgAN were included in this retrospective analysis of electronic health record data provided by Geisinger. The first clinical sign was defined as the first positive hematuria and/or proteinuria result prior to diagnosis. Patients were required to have ≥6 months of data availability before their first clinical sign and no evidence of end-stage kidney disease or kidney transplant prior to diagnosis. Time from first clinical sign to diagnosis and change in estimated glomerular filtration rate (eGFR) during this period were assessed overall and by quartiles of time to diagnosis.

Results: Among 227 patients with biopsy confirmed diagnosis of IgAN in the data, 117 patients (mean age 46.7 ± 19.4 years, 43.6% female) met the criteria for this study. Median time from first clinical sign to diagnosis was 5.0 months (interquartile range: 0.9, 29.3). Quartiles of time to diagnosis were as follows, in months: 1st (0.5, 3.7); 2nd (3.7, 14.7); 3rd (14.7, 51.4); 4th (51.4, 184.7). Mean monthly decrease in eGFR during time to diagnosis was 1.8 mL/min/1.73m^2, and mean total decline was 19.7 mL/min/1.73m^2. Patients in the first quartile of time to diagnosis had the largest mean monthly decline in eGFR of 4.8 mL/min/1.73m^2. Patients in the highest quartile of time to diagnosis had the largest total decrease in eGFR: mean monthly decline of 0.4 mL/min/1.73m^2, mean total decline of 36.0 mL/min/1.73m^2 (Supplementary Table 1).

Conclusion: A substantial proportion of patients with kidney biopsy confirmed IgAN experienced delay from first clinical sign to diagnosis. During this time, kidney function decreased, particularly among patients in the upper quartile of time to diagnosis. It is not known whether earlier detection of IgAN may help preserve kidney function and improve patient outcomes in IgAN, but these data suggest efforts to test such a hypothesis are warranted.

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Supplementary Table 1. Raw and monthly change in eGFR (mL/min/1.73m^2) by time to biopsy confirmed diagnosis

	Overall N = 85[1,2,3]	**Patients in Q1 (0.5, 3.7)[4] N = 22**	**Patients in Q2 (3.7, 14.7)[4] N = 21**	**Patients in Q3 (14.7, 51.4)[4] N = 21**	**Patients in Q4 (51.4, 184.7)[4] N = 21**
Raw change in eGFR					
Mean ± SD	–19.68 ± 29.50	–10.76 ± 19.11	–8.31 ± 19.15	–24.01 ± 37.47	–36.04 ± 31.26
Median (IQR)	–13.68 (–31.40, –0.38)	–2.13 (–15.89, –0.08)	–7.13 (–12.13, –0.38)	–19.76 (–42.38, –1.53)	–29.77 (–44.53, –22.58)
Monthly change in eGFR					
Mean ± SD	–1.79 ± 4.29	–4.78 ± 6.79	–1.18 ± 2.22	–0.61 ± 3.23	–0.44 ± 0.42
Median (IQR)	–0.47 (–2.04, –0.08)	–0.91 (–8.88, –0.04)	–0.76 (–2.14, –0.09)	–0.79 (–1.32, –0.08)	–0.35 (–0.61, –0.17)

Abbreviations: eGFR, estimated glomerular filtration rate; IQR, interquartile range; Q, quartile; SD, standard deviation.

Notes:

1. This analysis excludes patients who did not have at least two eGFR values > 30 days apart.
2. The first eGFR value was the first lab value that occurred within three months before the first clinical sign up until the diagnostic date.
3. The second eGFR value was the last lab value that occurred after the first clinical sign and before the diagnostic date.
4. Quartile values of time to biopsy confirmed diagnosis in months.