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# Prevalence and clinical characteristics of kidney transplants in complement 3 glomerulopathy patients: results from a real-world, multi-country survey

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## CONCLUSIONS

- This study found that despite treatment, patients with C3G continued to experience high CKD stages and experienced numerous symptoms. Nephrologists reported over 40% of their patients were eligible for a kidney transplant.
- While kidney transplants substantially improved CKD stage, proteinuria and symptomology, 60% of patients had a recurrence of C3G disease, suggesting that for a large proportion a kidney transplant will not be curative.
- There is a need for new treatments to slow disease progression and to reduce the need for transplantation, as well as to minimize the recurrence of disease post-transplantation.

Poster Presented at the World Congress of Nephrology (WCN), April 13–16, 2024.

## INTRODUCTION

- Complement 3 glomerulopathy (C3G) is a rare kidney disease, with an estimated worldwide incidence of 1-2 million people/year<sup>1</sup>.
- It is characterized by the dysregulation of the alternative pathway of the complement system, resulting in C3 deposition in the glomeruli<sup>2</sup>.
- C3G patients present with numerous clinical manifestations, including proteinuria, hematuria and hypertension<sup>3</sup>.
- These clinical manifestations are associated with a poor prognosis, with an estimated 50% of patients progressing to kidney failure within 10 years of diagnosis. Kidney transplant is an option for patients whose native kidneys fail<sup>3</sup>.

## METHODS

- Data were drawn from the Adelphi C3G Disease Specific Programme™ (DSP), a cross-sectional survey of C3G-treating nephrologists which also included the capture of retrospective data.
- Data were collected in France, Germany, Italy, Spain, the United Kingdom (EU5), China, Japan and the United States (US) from August 2022 – April 2023.
- Nephrologists who agreed to take part in this DSP completed forms for between 1-9 consecutive C3G patients, reporting on demographic and clinical information including transplant history and eligibility.
- The DSP methodology has been previously published and was conducted according to relevant regulations<sup>4</sup>.
- Descriptive analyses were performed on all data.

## OBJECTIVE

- This analysis assessed the prevalence and clinical characteristics of kidney transplants in C3G patients in the real-world setting across the US, EU5 (France, Germany, Italy, Spain and UK), China and Japan.

## LIMITATIONS

- Patients included in the DSP sample were the next eligible patients who consulted the participating physician and therefore, may not truly represent the overall population of patients with C3G in their country/region.

## RESULTS

### Patient characteristics

- In total, 111 nephrologists provided data for 385 patients (US n=100, EU5 n=189, China n=60, Japan n=36) – **Table 1**.
- 83% of patients were receiving pharmacological treatment at time of survey, with a further 9% having received treatment in the past, and 8% were treatment naive.

**Table 1. Characteristics of C3G patients**

	All Regions (n=385)	US (n=100)	EU5 (n=189)	China (n=60)	Japan (n=36)
Age at time of survey, median (IQR)	42.0 (30.0-55.0)	41.0 (29.0-54.8)	40.0 (28.0-57.0)	39.0 (33.2-50.8)	51.5 (40.5-57.8)
Male patients, n (%)	227 (59.0)	56 (56.0)	113 (60.0)	34 (56.7)	24 (66.7)
BMI, median (IQR)	24.1 (21.5-26.3)	25.5 (24.0-28.2)	23.7 (21.4-26.4)	22.9 (21.7-25.2)	20.4 (19.1-22.8)
Time since diagnosis, median years (IQR)	1.5 (0.6-3.4)	1.1 (0.6-2.3)	1.7 (0.7-3.7)	1.8 (0.8-3.5)	2.7 (1.1-5.4)
Currently receiving treatment, n (%)	321 (83.4)	79 (79.0)	161 (85.2)	53 (88.3)	28 (77.8)

**Abbreviations:** US: United States; EU5: France, Germany, Italy, Spain and the United Kingdom; IQR: Interquartile range; BMI: Body mass index

### Kidney transplantation

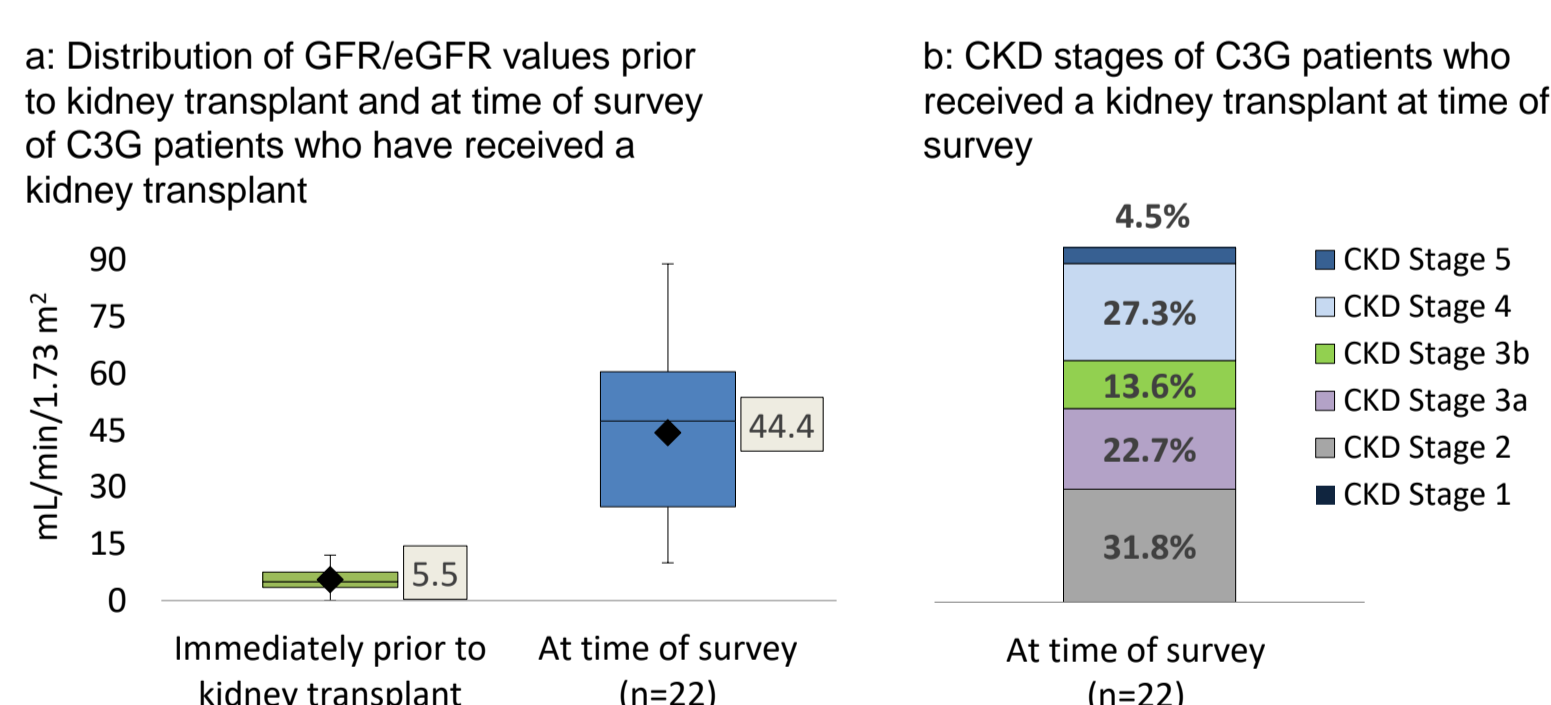
- Of all patients in the sample, 6.5% (n=25) have previously had a kidney transplant. Among these, one patient had undergone two transplants, and another had undergone four transplants – **Table 2**.
- The proportion of patients receiving a kidney transplant was much higher in the EU5 than other regions: 11.1% in the EU5 vs 2.0%, 3.3% and 0.0% in US, China, and Japan, respectively.
- Of the patients who have received a kidney transplant, 65.2% experienced a recurrence of their C3G post-transplant. The median (IQR) time since first C3G recurrence was 0.8 (0.3-2.2) years.
- For patients who have received only one kidney transplant (n=23), the median (IQR) time since transplant to survey was 1.7 (0.7-2.9) years.
- Nephrologists reported 41.6% (n=160) of patients were eligible for a kidney transplant, and of these, 30.0% (n=48) were on a waiting list to receive one.
- Of those not eligible (n=225), 81.8% were not at the stage to require a transplant and 12.0% had other health problems that prevented them from being suitable. For 3.6% of patients, the physician considered them unsuitable due to their risk of C3G recurrence.

**Table 2: Prevalence and eligibility of kidney transplant**

	All Regions		US		EU5		China		Japan	
	N	n (%)	N	n (%)	N	n (%)	N	n (%)	N	n (%)
Undergone a kidney transplant	385	25 (6.5)	100	2 (2.0)	189	21 (11.1)	60	2 (3.3)	45	0 (0.0)
Patients who received one kidney transplant	25	23 (92.0)	2	2 (100.0)	21	19 (90.5)	2	2 (100.0)	0	0 (0.0)
Patients who received two or more kidney transplants	25	2 (8.0)	2	0 (0.0)	21	2 (9.5)	2	0 (0.0)	0	0 (0.0)
C3G recurrence following a kidney transplant	23*	15 (65.2)	0	0 (0.0)	20*	14 (70.0)	1*	1 (100.0)	0	0 (0.0)
Eligible for a kidney transplant	385	160 (41.6)	100	38 (38.0)	189	89 (47.1)	60	15 (25.0)	36	18 (50.0)
Currently receiving treatment	321	137 (42.7)	79	30 (38.0)	161	78 (48.4)	53	15 (28.3)	28	14 (50.0)
Currently on a waiting list for a kidney transplant	160	48 (30.0)	38	14 (36.8)	89	25 (28.1)	15	8 (53.3)	18	1 (5.5)
Time since first kidney transplant, years (excluding "Don't know")	21*	1.7 (0.7-2.9)	2	1.5 (0.5-2.6)	18*	1.9 (0.9-3.1)	1	0.4 (0.4-0.4)	0	0.0 (0.0-0.0)
Time since first C3G recurrence, years (excluding "Don't know")	13*	0.8 (0.3-2.2)	0	0.0 (0.0-0.0)	12*	0.9 (0.4-2.5)	1	0.3 (0.3-0.3)	0	0.0 (0.0-0.0)

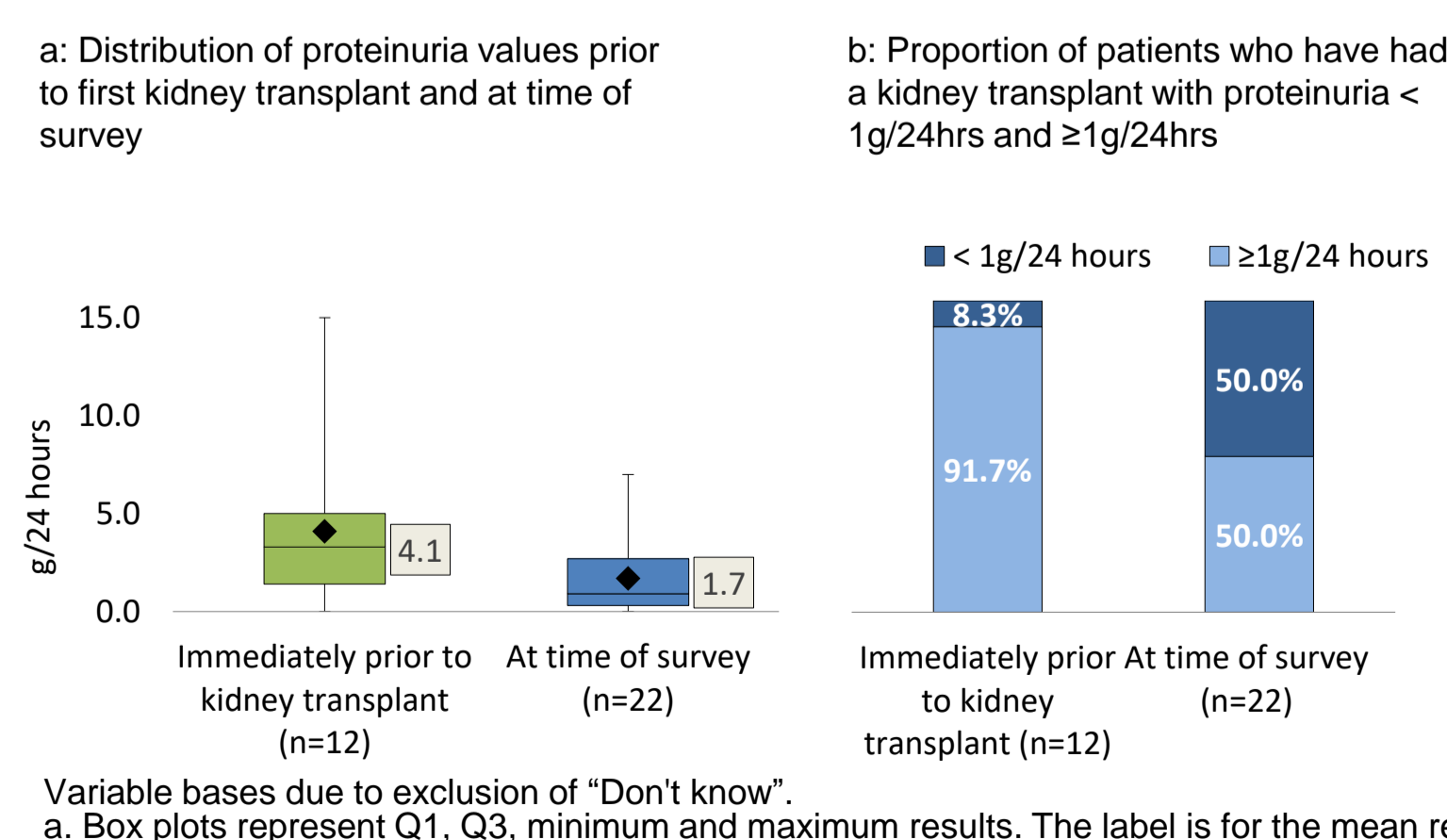
**Abbreviations:** US: United States; EU5: France, Germany, Italy, Spain and the United Kingdom; IQR: Interquartile range; KT: Kidney transplant. \* variable base due to exclusion of "Don't know"

**Figure 1. Distribution of GFR/eGFR and chronic kidney disease (CKD) stages among C3G patients who have received a kidney transplant**



**a.** Box plots represent Q1, Q3, minimum and maximum results. The label is for the mean response.  
**b.** CKD Stage 1: eGFR/GFR  $\geq 90$ ; CKD Stage 2: eGFR/GFR 60-89.99; CKD Stage 3a: eGFR/GFR 45-59.99; CKD Stage 3b: eGFR/GFR 30-44.99; CKD Stage 4: eGFR/GFR: 15-29.99; CKD Stage 5: eGFR/GFR  $< 15$  mL/min/1.73 m<sup>2</sup>. Variable bases due to exclusion of "Don't know".

**Figure 2. Distribution of proteinuria among C3G patients who have received a kidney transplant**



Variable bases due to exclusion of "Don't know".  
**a.** Box plots represent Q1, Q3, minimum and maximum results. The label is for the mean response.

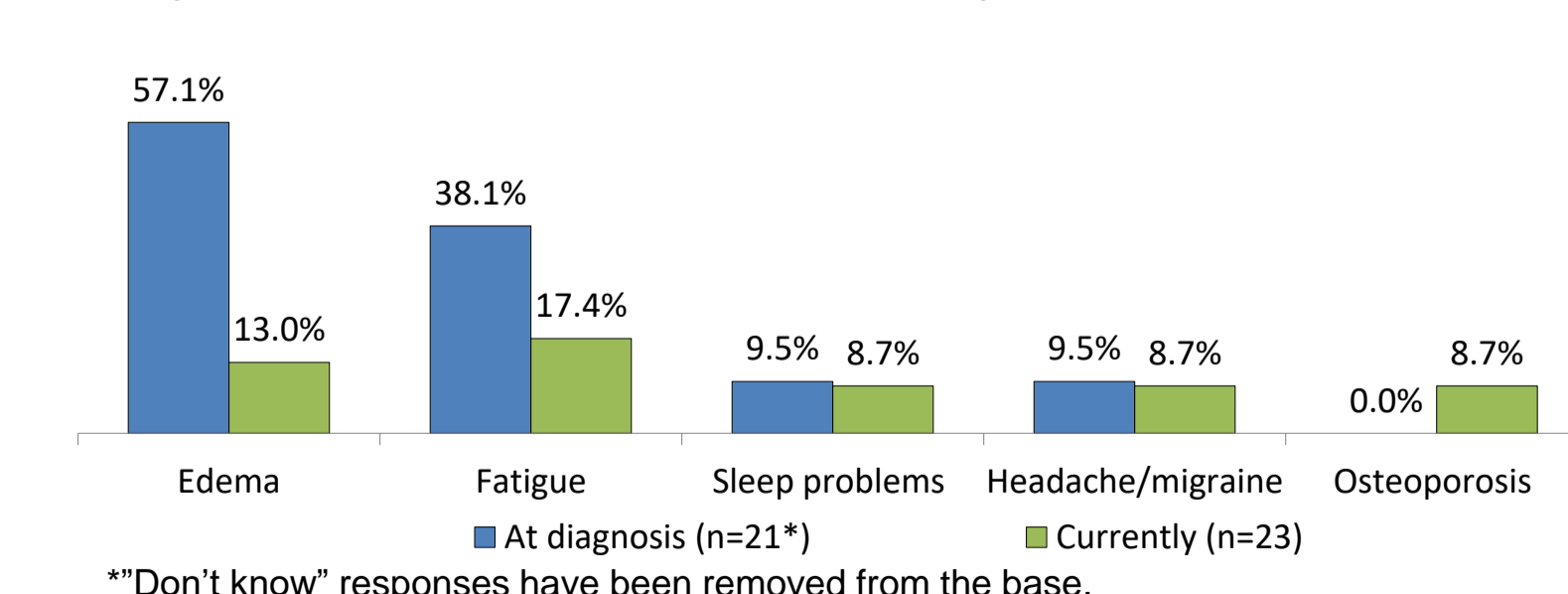
### GFR/eGFR and proteinuria among C3G patients who have received a kidney transplant

- From the time immediately prior to kidney transplant to the time of survey completion, nephrologists reported a mean improvement in GFR/eGFR of 38.9 mL/min/1.73 m<sup>2</sup> – **Figure 1a**.
- Almost all patients saw an improvement in their CKD stage post-transplant. Prior to transplant, all patients were in CKD stage 5, compared to just 4.5% post-transplant – **Figure 1b**
- From immediately prior to kidney transplant to the time of survey completion, nephrologists reported a mean improvement in proteinuria of 2.4 g/24 hour – **Figure 2a**.
- Proteinuria levels improved following a kidney transplant, with only 8.3% of patients having proteinuria  $< 1$ g/24 hour at time of transplant, compared to 50.0% at time of survey – **Figure 2b**.

### Symptoms related to kidney disease

- Symptoms related to kidney disease were reported among 61.9% of patients at the time of diagnosis and among 43.5% at the time of survey, and included fatigue, edema, headaches/migraines, sleep problems and osteoporosis – **Figure 3**.

**Figure 3. Symptoms related to kidney disease at diagnosis and time of survey, for patients who received a kidney transplant**



## Acknowledgments

Editorial assistance under the guidance of the authors was provided by Alice Simons of Adelphi Real World

## Disclosures

The authors had full editorial control of the poster and provided their final approval of all content. Data collections for the DSP were undertaken by Adelphi Real World as part of an independent survey and data is owned by Adelphi. Novartis is one of multiple subscribers to the DSP and supported this analysis. This study was funded by Novartis Pharma AG and several authors are employees/shareholders of Novartis Pharma AG.

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