STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2	Circulating IgA anti-α3(IV)NC1 antibodies were examined by ELISA using recombinant human α3(IV)NC1 as solid phase antigens in 107 patients with anti-GBM disease and 115 controls. Clinical, pathological and follow-up data of patients were retrospectively analyzed
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2	Circulating IgA anti-α3(IV)NC1 antibodies occurred in about one fourth of anti-GBM patients in our center and were specific to anti-GBM disease.
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3	Anti-glomerular basement membrane (GBM) disease is a rare but severe autoantibody-mediated immune disorder. Typically, it is mediated by immunoglobulin G (IgG) autoantibodies against the non-collagenous domain of the α3(IV) collagen chain (α3(IV)NC1). In some cases, IgA mediated anti-GBM disease have been reported. Whether IgA anti-GBM antibodies affect the clinical-

				pathologic characteristics and outcome of typical anti-GBM disease deserve further study.
Objectives	3	State specific objectives, including any prespecified hypotheses	3	Whether IgA antibodies against GBM, particularly α3(IV)NC1, are associated with the disease or kidney injuries are still unknown. Therefore, we investigated the prevalence of IgA antibodies against all five α chains of type IV collagen in a large cohort of anti-GBM disease.
Methods				
Study design	4	Present key elements of study design early in the paper	3	Circulating IgA anti-α3(IV)NC1 antibodies were examined by ELISA using recombinant human α3(IV)NC1 as solid phase antigens in 107 patients with anti-GBM disease and 115 controls. Clinical, pathological and follow-up data of patients were retrospectively analyzed.
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3-4	One hundred and seven patients with anti-GBM disease from August 2002 to June 2020 at Peking University First Hospital were included. Demographic and clinical data were collected at the time of diagnosis. Original kidney biopsy reports were reviewed for pathological analysis. Clinical data,

				histopathological findings, treatments and prognosis were collected from medical records at the time of diagnosis and during follow-up.
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	4	Disease control groups included 20 patients with crescentic IgA nephropathy (cIgAN), 20 with ANCA-associated vasculitis (AAV), 15 with thrombotic microangiopathy (TMA), 20 with membranous nephropathy (MN), and 20 with diabetic kidney disease (DKD). Sera from 20 healthy donors were used as normal controls. Sera or plasmapheresis effluents from all the patients were collected at the time of diagnosis or on the day of kidney biopsy. All samples were stored at -80℃ until detection. This research complied with the ethical principles stated in the Declaration of Helsinki and approved by the ethic committee of Peking University First Hospital.
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case		
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4	The diagnosis was made by the detection of anti-GBM

				antibodies in circulation and/or typical linear deposition of IgG along GBM in kidney biopsy, excluding other causes of linear fluorescence including diabetes mellitus and paraproteinemia. The primary endpoint (renal survival) was set as end-stage kidney disease (ESKD) defined as dialysis dependence for >3months.
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*5*	All assays were run in duplicate, and when standard errors >10% were found, samples were re-analyzed. Sera from twenty healthy donors were measured and the cutoff values were set at 2 standard deviations (SD) above the mean.
Bias	9	Describe any efforts to address potential sources of bias	4	Patients who had not progressed to ESKD before death were treated as censored data when analyzing renal survival.
Study size	10	Explain how the study size was arrived at	3	One hundred and seven patients with anti-GBM disease from August 2002 to June 2020 at Peking University First Hospital were included.

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Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5	Quantitative variables were presented as mean and standard deviation (mean±SD) when they were normally distributed and as median (interquartile range) when they were not normally distributed.
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5	SPSS (version 22.0, IBM, Chicago, IL) was used for statistical analysis. Quantitative variables were presented as mean and standard deviation (mean±SD) when they were normally distributed and as median (interquartile range) when they were not normally distributed. Qualitative variables were exhibited as frequency and percentage [n (%)]. Differences of continuous variables were assessed using t test for data that were normally distributed or Mann–Whitney U test for data that were not normally distributed. Categorical variables were compared with $\chi 2$ or Fisher's exact test. Survival analyses were conducted using Kaplan-Meier curves. Univariate survival analysis was processed by log-rank test. Spearman correlation analysis was used for correlation analysis. All statistical analyses were two-tailed and a value of $P < 0.05$ was

				considered significant. GraphPad Prism 8 was used to draw charts.
		(*b*) Describe any methods used to examine subgroups and interactions		
		(*c*) Explain how missing data were addressed		
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy		
		(*e*) Describe any sensitivity analyses		
Results				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	3-4，6	One hundred and seven patients with anti-GBM disease from August 2002 to June 2020 at Peking University First Hospital were included. Among the 107 patients with anti-GBM disease enrolled in this study, 59 had kidney biopsies. Kidney pathologic characteristics of the biopsied anti-GBM patients with or without IgA anti-α3(IV)NC1 antibodies were further compared
		(b) Give reasons for non-participation at each stage		
		(c) Consider use of a flow diagram		
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6	There were no significant differences between the two groups with or without IgA anti-α3(IV)NC1 antibodies in gender, age, smoking, prodromal infection and hemoptysis.

		(b) Indicate number of participants with missing data for each variable of interest	6	Among the 107 patients with anti-GBM disease enrolled in this study, 59 had kidney biopsies.
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	7	Follow-up duration between the two groups were comparable (Median, 27.8 versus 32.2 months, P = 0.857]
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	*7*	Circulating IgA anti-α3(IV)NC1 antibodies occurred in about 18.7% of patients with classical anti-GBM disease and were specific to α3(IV)NC1. Follow-up duration between the two groups were comparable (Median, 27.8 versus 32.2 months, *P* = 0.857]. Patients with circulating IgA anti-α3(IV)NC1 antibodies showed a higher levels of serum IgG anti-α3(IV)NC1 antibodies than those without. Patients with or without IgA anti-α3(IV)NC1 antibodies had comparable survival rates
		Case-control study—Report numbers in each exposure category, or summary measures of exposure		
		Cross-sectional study—Report numbers of outcome events or summary measures		
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included		
		(*b*) Report category boundaries when continuous variables were categorized		
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		

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Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses		
Discussion				
Key results	18	Summarise key results with reference to study objectives	11	Circulating IgA anti-α3(IV)NC1 antibodies occurred in about 18.7% of patients with classical anti-GBM disease and were specific to α3(IV)NC1. Patients with circulating IgA anti-α3(IV)NC1 antibodies showed a higher levels of serum IgG anti-α3(IV)NC1 antibodies than those without.
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10	However, given the small sample of this rare entity, no direct conclusions can be drawn and further investigations are needed in future to elucidate the clinical significance of these IgA antibodies.
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11	Further investigations might be needed to elucidate the immune modulation effects of circulating IgA anti-GBM antibodies and their value as potential biomarkers.
Generalisability	21	Discuss the generalisability (external validity) of the study results		
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	11	This work was supported by the National Natural Science Foundation of China (82090020 to MHZ, 82070732 to ZC, 82270763 to XYJ, and 82200789 to CRS), the

	Beijing Municipal Science and Technology Commission Foundation (Z221100007922041 to ZC), the CAMS Innovation Fund for Medical Sciences (2019-I2M-5-046).

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.