

The National Unified Renal Translational Research Enterprise (NURTuRE): A unique cohort of persons with chronic kidney disease and national biorepository

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Introduction: Chronic kidney disease (CKD) is a common but heterogenous condition that is associated with multiple adverse outcomes. Substantial progress has been made in understanding mechanisms of progression and the pathogenesis of associated complications, but few new therapies have emerged over the past two decades and CKD remains a global health challenge. The NURTuRE-CKD cohort has been established to provide the first UK centralised renal bio-clinical resource with linked data to facilitate future research. Funding and governance is achieved via a unique collaborative partnership between Kidney Research UK, industry and academic investigators. The aims of the project are to improve risk prediction and promote a better understanding of the mechanisms driving adverse outcomes in CKD.

Methods: Recruitment was conducted at 15 nephrology centres in England, Scotland and Wales between July 2017 and August 2019. Eligible patients had an estimated glomerular filtration rate (GFR) between 15 and 59 ml/min/1.73m² or >60 ml/min/1.73m² with urine albumin to creatinine ratio (ACR)>30mg/mmol and had been assessed at least once in a nephrology clinic. Patients with idiopathic nephrotic syndrome were excluded. Participants underwent detailed assessment of their medical and drug history, answered a series of questionnaires related to quality of life and provided blood and urine samples. Biosamples were handled according to a strict standard operating procedure that required samples to be frozen within two hours of collection. Prior to freezing, samples were aliquoted to generate up to 132 aliquots per participant. Renal biopsies will be digitally scanned to create a histology archive and surplus tissue is available for further analysis. Follow-up visits and sample collection will be conducted at 12-18 months after recruitment. Routine laboratory data and clinical outcomes (onset of end-stage kidney disease, renal replacement therapy or death) will be collected by the UK Renal Registry for up to 15 years. Results presented here represent pooled data from individual hospital laboratories.

Results: Recruitment of 3004 participants was completed in August 2019. A summary of baseline data is presented in the Table. Completeness of data was excellent (>95%). The cohort is broadly representative of patients followed up in nephrology clinics in the UK. Almost half of the participants are 65 years or older and there is a predominance of males. The most common specific renal diagnosis is diabetic nephropathy (11.4%) but the largest diagnostic category is "CKD of unknown cause" (32%). Multi-morbidity is very common with more than 75% having two or more comorbidities.

Conclusion: NURTuRE-CKD has established a unique bioclinical resource to accelerate research on risk factors and mechanisms leading to adverse outcomes associated with CKD. The development of a national

renal biorepository is in keeping with the aims of the UK Renal Research Strategy. Biosamples and data will be made available to the research community via an independent access committee. Initial planned analyses will focus on a large panel of blood and urine biomarkers (n=35) as well as exome sequencing.