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Newnham, AL and Friend, AJ orcid.org/0000-0001-9864-5605 (2019) Childhood kidney disease is associated with increased risk of end-stage renal failure in adulthood. Archives of Disease in Childhood: Education and Practice Edition, 104 (1). pp. 55-56. ISSN 1743-0585

https://doi.org/10.1136/archdischild-2018-315332

Childhood kidney disease is associated with increased risk of end-stage renal failure in adulthood

STUDY DESIGN

Design: Cohort study

STUDY QUESTION

Setting: Israel

Patients: 1.5 million young people (aged 16-25) examined prior to military service between 1967 and 1997.

Exposure: Any history of childhood kidney disease, including structural anomalies and pyelonephritis.

Outcomes: Development of end-stage renal failure in adulthood.

Follow-up period: 30 years from initial examination.

Patient follow-up: Inclusion on the Israeli end-stage renal failure disease registry.

MAIN RESULTS:

The study results are summarised in table 1 below.

History of childhood renal disease	**Unadjusted HR (95% CI)**	**Adjusted HR (95 CI)***	**Adjusted HR (95 CI)****
Nil	Reference	-	-
Congenital renal/urinary tract anomaly	6.07 (4.04-9.12)	5.47 (3.63-8.24)	5.19 (3.41-7.90)
Pyelonephritis	3.80 (2.94-4.76)	3.74 (2.94-4.76)	4.03 (3.16-5.14)
Glomerulonephritis	3.91(2.83-5.41)	3.84 (2.78-5.31)	3.85 (2.77-5.36)
Any renal disease	4.04 (3.49-4.93)	4.04 (3.40-4.81)	4.19 (3.52-4.99)

Table 1: Risks of adult end-stage renal disease based on history of childhood renal disease *adjusted for age and sex **adjusted for age, sex, father's place of birth, period of enrolment, body mass index and systolic blood pressure

CONCLUSION: A history of childhood renal disease, even if there is no evidence of renal impairment in adolescence, is associated with significantly increased risk of end-stage renal failure in adulthood.

ABSTRACTED FROM: Calderon-Margalit, R., Golan, E., Twig, G., Leiba, A., Tzur, D., Afek, A., Skorecki, K. and Vivante, A., 2018. History of Childhood Kidney Disease and Risk of Adult End-Stage Renal Disease. New England Journal of Medicine, 378(5), pp.428-438.

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How important is a history of kidney disease in childhood if at the age of 16 you have no proteinuria, a normal blood pressure (BP) and serum creatinine? This cohort study by Calderon-Margalit et al suggests it is more important than previously recognised, as you are still 4 times more likely to progress to end stage renal failure (ESRF) before the age of 40. This may leave some of us feeling uncomfortable about those we have transferred from our services; did we give explicit advice about follow up or did we falsely reassure that all would be ok?

This large historical database is limited by an information gap between renal function at age 16 and the age of development of ESRF, with no data provided about additional risk factors between these time points. It cannot help inform the decision regarding frequency of monitoring, what this should include, and the appropriate thresholds for treatment initiation. As evidence shows that early detection and proactive management of hypertension and proteinuria can slow the progression to ESRF in those with CKD[1]this would have been a useful endpoint to have been included.

The pragmatic approach at present would be annual surveillance of BP and urinalysis via primary care on transition from paediatric to adult services. However, many healthcare systems are not yet sophisticated enough to ensure this would occur, thus patient information and empowerment are essential. These patients will often have been too young to remember their initial presentation and robust transition processes are required to ensure the patient has the opportunity to discuss their past medical history and the potential consequences for their future health, including the role of annual surveillance.

In time, as our understanding of the genetics of renal disease and the use of renal registry data increases our understanding of disease sub-groups it could allow a rationalisation to this surveillance. However, the converse is more likely with an expanding number of children needing surveillance to include those born prematurely, with low birth weight or who suffer an acute kidney injury on the basis of the Brenner hyperfiltration hypothesis[2] where total nephron mass is important.

1. Fogo, A.B. Pediatr Nephrol (2007) 22: 2011.
2. Brenner BM et al.The hyperfiltration theory: a paradigm shift in nephrology, *Kidney Int*,1996,vol.49(pg.1774-1777)

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