Chronic Kidney Disease patients with Inheritable Kidney Disease have higher associated healthcare costs

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AIM

To identify characteristics and health service utilisation (HSU) amongst patients with chronic kidney disease (CKD) due to Autosomal Dominant Polycystic Kidney Disease (ADPKD), Inherited Kidney Disease (IKD) and all-CKD causes in Queensland.

BACKGROUND

Those with ADPKD and non-ADPKD IKD are an identifiable minority of CKD patients. Their HSU in Australia are not defined.

METHODS

Patients with ADPKD and IKD were identified from the CKD.QLD Registry (n=7,541) and a matched Queensland Health CKD cohort (n=22,129) based upon ICD-10 coding. Characteristics and HSU related to hospital presentations were analysed for 5 years retrospective from June 2016.

RESULTS

309 (1.04%) ADPKD and 277 (0.93%) IKD patients were identified from the combined cohort (n=29,670).

The median age at first admission of ADPKD, IKD and All-CKD patients were 53.7, 47.9 and 65.7years respectively with mean eGFR at CKD.QLD consent being 34.1, 36.5 and 40.8ml/min/1.73m^2. ADPKD and IKD compared to All-CKD had lower frequency of diabetes (17% vs 21% vs 48%) and cardiovascular disease (CVD; 34% vs 32% vs 46%). ADPKD and IKD were associated with higher incidence than All-CKD of dialysis within that 5year period (34% vs 24% vs 9%).

Median hospital admissions were higher in those with ADPKD or IKD compared to All-CKD (7 vs 8 vs 4) with similar average length of stay (3.2 vs 4.4 vs 3.6 days). Median 5 year healthcare costs were higher in those with ADPKD and IKD compared to All-CKD ($42,088 vs $45,929 vs $16,403).

Figure 1 – Study Cohort

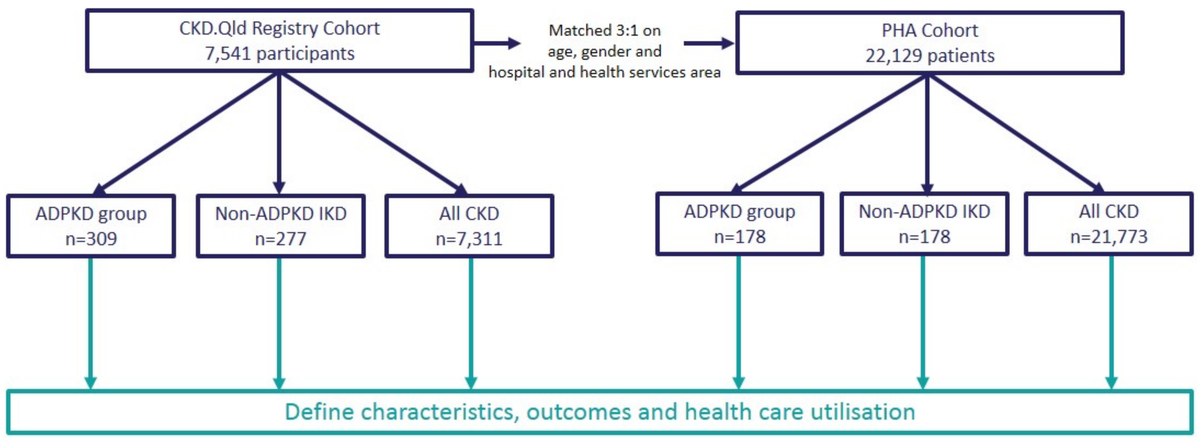

Table 2 – ADPKD & IKD ICD-10 Codes

ADPKD		
	Q61	Cystic kidney disease
	Z82.71	Family history of polycystic kidney
Other IKD		
	D57	Sickle-cell disorders
	E72.04	pyelonephritis and tubulo-interstitial nephritis in cystinosis
	E75.21	Fabry disease
	E85.0	Non-neuropathic heredofamilial amyloidosis
	E85.2	Heredofamilial amyloidosis, unspecified
	N02.2	Recurrent and persistent hematuria with diffuse membranous glomerulonephritis
	N07	Hereditary nephropathy, not elsewhere classified
	N25.1	Nephrogenic diabetes insipidus
	P96.0	Congenital renal failure
	Q60	Renal agenesis and other reduction defects of kidney
	Q62	Congenital obstructive defects of renal pelvis and congenital malformations of ureter
	Q63	Other congenital malformations of kidney
	Q64	Other congenital malformations of urinary system
	Q85.1	Tuberous sclerosis
	Q87.2	Congenital malformation syndromes predominantly involving limbs
	Q87.81	Alport Syndrome
	Q87.89	Other specified congenital malformation syndromes, not elsewhere classified
	Z84.1	Family history of disorders of kidney and ureter
	Z87.71	Personal history of (corrected) congenital malformations of genitourinary system

CONCLUSIONS

- Those with ADPKD and IKD are **younger** with **earlier stage CKD** and **lower prevalence of diabetes and CVD** compared to other CKD patients.
- Despite this, they are **more likely to require dialysis** within 5years and have **increased hospital costs**.

Table 1 – All Data and Variables

	CKD Registry cohort			PHA cohort		
	PKD	***Other Genetic***	***All CKD***	***PKD***	***Other Genetic***	***All CKD***
N	131	99	7,311	178	178	21,773
Gender Male, n (%)	68 (52%)	63 (64%)	3995 (55%)	94 (52%)	101 (57%)	11750 (54%)
Age, n (%)						
<40	20 (15%)	38 (38%)	732 (10%)	23 (13%)	35 (20%)	721 (3%)
40-49	27 (21%)	15 (15%)	699 (10%)	24 (13%)	22 (12%)	869 (4%)
50-59	36 (27%)	13 (13%)	1199 (16%)	44 (25%)	29 (16%)	1697 (8%)
60-69	24 (18%)	12 (12%)	1933 (26%)	53 (30%)	31 (17%)	3824 (18%)
70-79	18 (14%)	15 (15%)	1978 (27%)	23 (13%)	41 (23%)	6341 (29%)
>80	6 (5%)	6 (6%)	770 (11%)	11 (6%)	20 (11%)	8321 (38%)
Median	53.7	47.9	65.7	59.2	60.6	75.7
Indigenous						
N non-missing	88 (67%)	73 (74%)	5136 (70%)	174 (98%)	176 (99%)	21715 (100%)
n (%)	1 (1%)	3 (4%)	354 (7%)	4 (2%)	6 (3%)	1077 (5%)
eGFR at consent (ml/min/1.73m2)						
N non-missing	114 (87%)	91 (92%)	6183 (85%)	--	--	--
Median (IQR)	28 (34)	32 (25)	37 (27)	--	--	--
Mean (SD)	34.1 (24.2)	36.5 (23.6)	40.8 (21.7)	--	--	--
Diabetes						
N non-missing	92 (70%)	80 (81%)	5423 (74%)	--	--	--
n (%)	16 (17%)	17 (21%)	2592 (48%)	--	--	--
CVD						
N non-missing	71 (54%)	62 (63%)	4379 (60%)	--	--	--
n (%)	24 (34%)	20 (32%)	2029 (46%)	--	--	--
Hypertension						
N non-missing	68 (52%)	54 (55%)	4066 (56%)	--	--	--
n (%)	54 (79%)	43 (80%)	3291 (81%)	--	--	--
BMI						
N non-missing	76 (58%)	65 (66%)	4507 (62%)	--	--	--
Median (IQR)	29 (7)	28 (8)	30 (9)	--	--	--
Mean (SD)	29.8 (7.5)	29.2 (8.1)	31.2 (7.8)	--	--	--
Dialysis ≥1 dialysis admissions, n (%)	44 (34%)	24 (24%)	661 (9%)	91 (51%)	56 (31%)	1580 (7%)
Hospital admissions^						
≥1 admissions, n (%)	130 (100%)	99 (100%)	6407 (88%)	178 (100%)	178 (100%)	21746 (100%)
Median (IQR)	7 (6)	8 (9)	4 (7)	8 (9)	10 (15)	7 (8)
Mean (SD)	8.8 (9.1)	10.2 (9.1)	7.2 (9.9)	11.0 (9.2)	14.4 (12.4)	10.5 (15.2)
Average length of stay, days^ Mean (SD)	3.2 (2.7)	4.4 (6.6)	3.6 (3.8)	4.4 (3.6)	5.4 (5.9)	6.0 (8.2)
Cost of health care						
Non-zero cost, n (%)	127 (97%)	97 (98%)	6050 (83%)	NA	NA	NA
Median (IQR)	$42,088 (69384)	$45,929 (75587)	$16,403 (55150)	NA	NA	NA
Mean (SD)	$68,190 (95175)	$78,436 (87583)	$48,761 (86751)	NA	NA	NA

^ excludes dialysis

CKD Registry is a CKD surveillance program collecting information from consented participants

The PHA cohort is a group of de-identified patients whose data were made available for research purposes based on the Public Health Act in Queensland, Australia

NA not available at the time of writing