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CHRONIC KIDNEY DISEASE IN MALAYSIA

PREVALENCE AND ASSOCIATED FACTORS

Thamil Arasu Saminathan[1], Muhammad Fadhli[1], Tania Gayle[1], Halizah Mat Riffin[1], Hasimah Ismail[1], Norazizah Ibrahim Wong[2], Wan Shakira[1], Hooi Lai Seong[3], Sunita Bavanandan[4], Ghazali Ahmad[4], Ong Loke Meng[5,6], Esther Tan[7], Irene Wong[8], Fatimah Othman[3], Hamizatul Akmal[1], Haji Tahir Aris[9]

1 Institute for Public Health, National Institutes of Health Malaysia, Ministry of Health Malaysia
2 Sector for Biostatistics & Data Repository, National Institutes of Health Malaysia, Ministry of Health Malaysia
3 Sultanah Aminah Hospital, Johor, Ministry of Health Malaysia
4 Kuala Lumpur Hospital, Ministry of Health Malaysia
5 Pulau Pinang Hospital, Ministry of Health Malaysia
6 Clinical Research Centre, Penang, Ministry of Health Malaysia
7 Selayang Hospital, Ministry of Health Malaysia
8 Tengku Ampuan Rahimah Hospital, Klang, Ministry of Health Malaysia
9 Institute for Medical Research, Ministry of Health Malaysia

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Introduction

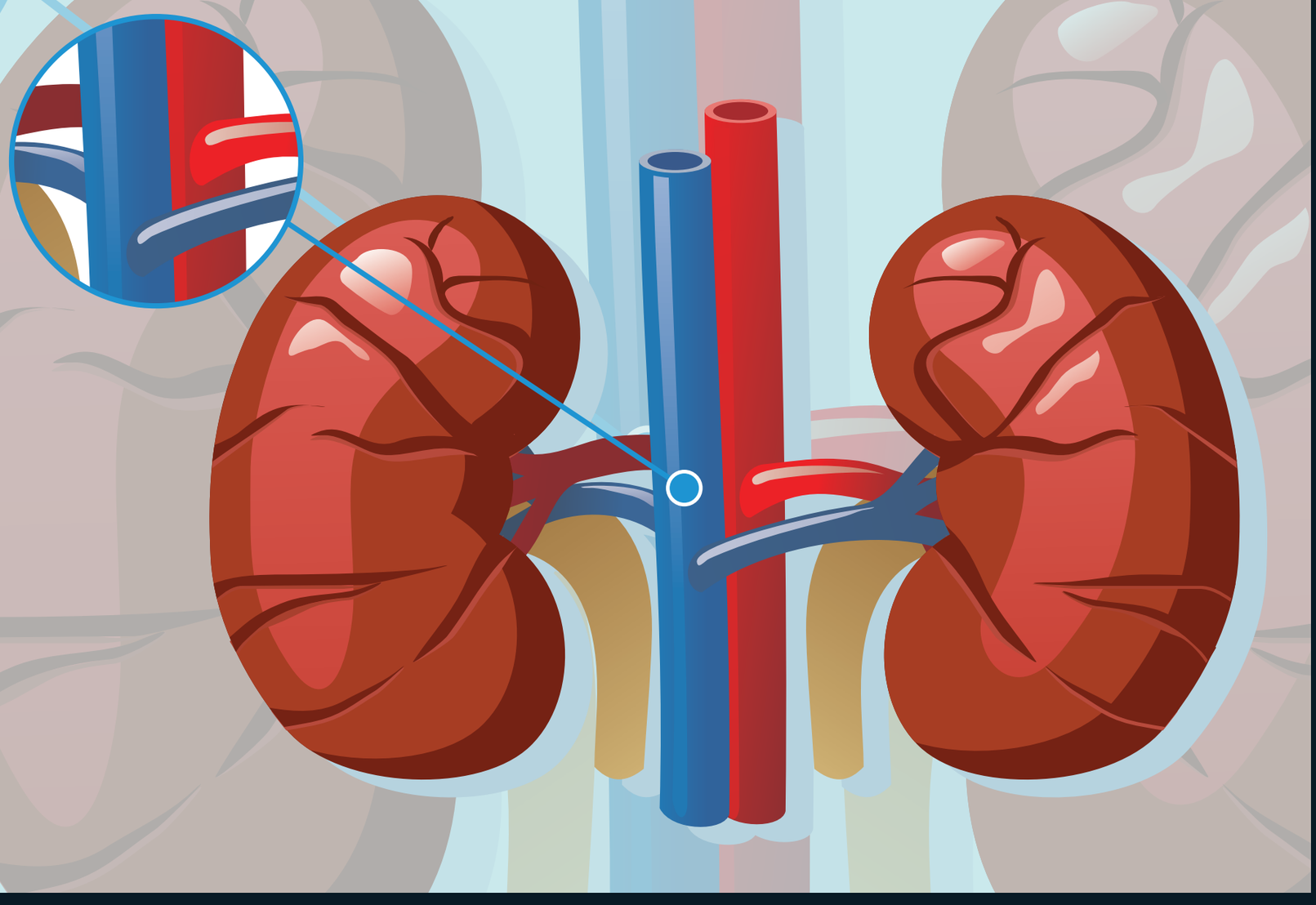
According to the Global Burden of Disease Study 2017, the prevalence of chronic kidney disease (CKD) globally was 9.1%[1]. Malaysia recorded a similar prevalence of 9.07% in the 2011's National Health and Morbidity Survey[2]. We aim to determine the current prevalence and associated factors of CKD among adults in Malaysia.

Material and Methods

A nation-wide, population-based, cross-sectional study was conducted in 2018 among adults aged ≥18-year-old. Total of 1,398 adults were randomly selected, using stratified cluster method.

Blood for serum creatinine and random blood sugar was taken from respondents at their home by qualified staff from a nearby Ministry of Health (MOH) hemodialysis unit. Urine albumin-to-creatinine ratio (uACR) was measured using a single urine sample.

The estimated glomerular filtration rate (eGFR) was measured with a calibrated serum creatinine using the CKD-EPI equation. CKD was defined as eGFR < 60 ml/min/1.73m^2 or the presence of persistent albuminuria if eGFR ≥ 60 ml/min/1.73m^2.



Results

A total of 1398 individuals were approached for this study, and 75% of them (n=1047) consented to participate. Serum creatinine was measured in 977 respondents. The final analysis set comprised of 890 respondents.

Table 1 shows the prevalence of CKD by stages (n = 890). Our study shows that the prevalence of CKD in Malaysia was 15.48% (95% CI: 12.30, 19.31).

Using multivariate analysis, as seen in Table 2, shows that hypertension (aOR 3.72), diabetes mellitus (aOR 3.32), increasing Body Mass Index (aOR 1.06), and increasing age (aOR 1.06) were significantly associated with CKD.

Table 1: Prevalence of CKD by stages (N = 890)

CKD Stages	n	Estimated population	Prevalence (%)	95% CI
Total CKD	158	2,607448	15.48	12.30, 19.31
Stage 1	42	649,069	3.85	2.51, 5.87
Stage 2	51	811,853	4.82	3.14, 7.32
Stage 3	59	1,091,582	6.48	4.41, 9.43
Stage 4-5	6	54, 944	0.33	0.14, 0.78

Discussion

This study has demonstrated a rising prevalence of CKD in Malaysia over the last 7 years since the previous study, the prevalence of 9.07 in 2011 to 15.48% currently. The probable reasons accounting for this rising trend are the increasing prevalence of non-communicable diseases that is associated with CKD and changes in population demographics.

National Health Morbidity Surveys have shown an alarming increase in the prevalence of diabetes in Malaysia over the past decade; from 11.2% in 2011[2] to 18.3.2% in 2019[3]; with the prevalence of hypertension persistently high at above 30.0% in the same surveys.

The prevalence of overweight and obesity among adults had also increased during the same period. Prevalence of obesity was 15.1% in 2011[2] and 19.7% in 2019[3].

Population ageing in Malaysia could also have contributed to the observed increase in CKD prevalence as the median age of the overall Malaysian population was 26.3 years in 2010[4] and 28.6 in 2018[5].

Conclusion

The results show the need to continue surveillance for CKD and its associated factors in Malaysia and to implement new strategies aimed at preventing the development and progression of CKD. The adoption of CKD prevention and management initiatives (ACT-KID 2018-2025)[6], can improve CKD care at every level especially its prevention and early detection.

Table 2: Factors associated with chronic kidney disease by univariate and multivariate analysis (N = 890)

Variable	N	% with CKD	p-value	Unadjusted OR (95% CI)	p-value	Adjusted OR* (95% CI)
Age (years)			<0.001	1.08 (1.06,1.09)	<0.001	1.06 (1.04,1.08)
Gender						
Male	59	16.1		1		1
Female	99	18.9	0.287	1.21(0.85,1.73)	0.198	1.50 (0.81, 2.79)
Race						
Malay	110	18.6		1		1
Chinese	11	12.6	0.176	0.63 (0.33, 1.23)	0.196	0.60 (0.27, 1.31)
Indian	7	13.0	0.303	0.65 (0.29,1.48)	0.204	0.53 (0.20, 1.42)
Others	30	18.9	0.949	1.02 (0.65, 1.59)	0.153	1.53 (0.86, 2.73)
Strata						
Urban	56	15.1		1		1
Rural	102	19.6	0.085	1.37 (0.96,1.96)	0.141	1.42 (0.89,2.27)
Household Income						
Low (<RM 2614 per month)	112	19.4		1		1
Middle (RM 2614-10455 per month)	42	14.8	0.506	1.44 (0.49,4.24)	0.133	1.48 (0.89, 2.45)
High (≥RM 10456 per month)	4	14.3	0.943	1.04 (0.34,3.15)	0.307	1.93 (0.55, 6.87)
Ever Cigarette Smoking						
Yes	47	16.6	0.542	0.89 (0.61,1.30)	0.251	1.46 (0.77, 2.78)
No	111	18.3		1		1
Physical Activity						
Active	83	15.6		1		1
Inactive	75	21.0	0.038	1.442(1.02,2.04)	0.368	1.23 (0.79, 1.91)
Diabetes						
Yes	80	46.0	<0.001	6.96 (4.76,10.18)	<0.001	3.32 (2.20,5.03)
No	78	10.9		1		1
Hypertension						
Yes	141	31.1	<0.001	11.14 (6.60,18.81)	<0.001	3.72 (2.08,6.66)
No	17	3.9		1		1
Hypercholesterolemia						
Yes	79	30.9	<0.001	3.08 (2.13,4.45)	0.513	1.17 (0.73, 1.87)
No	67	12.7		1		1
Heart Disease						
Yes	18	30.0		2.03 (1.14,3.64)	0.152	0.58 (0.27, 1.22)
No	136	17.4	0.017	1		1
Family History of Kidney Disease						
Yes	17	20.5	0.521	1.20 (0.68,2.11)	0.099	1.89 (0.89, 4.01)
No	139	17.6		1		1
Painkiller Use						
Yes	80	16.4	0.221	0.81 (0.57,1.14)	0.723	1.08 (0.70, 1.68)
No	78	19.6		1		1
Traditional Medicine Use						
Yes	17	15.3	0.468	0.82 (0.47,1.41)	0.281	0.69 (0.35,1.36)
No	140	18.1		1		1
BMI (kg/m2)			<0.001	1.07 (1.03,1.10)	0.006	1.06 (1.02,1.10)
Abdominal obesity						
Yes	123	20.9	0.001	2.02 (1.35,3.02)	0.260	0.68 (0.35, 1.33)
No	35	11.6	1			1

*Final model was adjusted by age, diabetes, hypertension, and BMI
OR = Odds Ratio
CI = Confidence Interval
Definition of chronic kidney disease status: eGFR< 60 ml/min/1.73 m2 and/or albuminuria
eGFR = estimated glomerular filtration rate
BMI = Body Mass Index

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