

## Epidemiology of chronic kidney disease in the local population in Jaffna, Sri Lanka

*Raveendran A and Balarajah S.*

Chronic kidney disease (CKD) is an emerging global health problem, resulting from an increased prevalence in hypertension and diabetes. A number of cases have been described in Sri Lanka of CKD of unknown aetiology (CKDu). The point prevalence of CKDu is 2-3% in the North Central Province.<sup>1</sup> Although recognised as a significant problem in some parts Sri Lanka, there is limited evidence regarding the aetiology of CKD in the Northern Province. Following the end of the treacherous twenty six-year long civil war, patients are now able to seek treatment from tertiary centres outside the northern territory.<sup>2</sup> This migration has altered the epidemiology of CKD around the country, justifying the need to extend research to all parts of Sri Lanka.

### Method

A cross-sectional demographic study was conducted at Jaffna Hospital between February and May 2012. 89 patients were recruited from the outpatient clinic, erythropoietin clinic and haemodialysis unit. Inclusion criteria were:

1. 18-90 years old;
2. CKD stages 1-5 as defined by the National Kidney may Foundation's Kidney Disease Outcomes Quality Initiative (KDOQI) guidelines;
3. Decreased eGFR (<90ml/min/1.73m<sup>2</sup>) for at least 3 months.

Patients were excluded if they were under 18 years or an inpatient in the hospital.

Data was collected via patient interviews and questionnaires and included:

4. Demographics (age, sex, ethnicity, BMI, smoking status, alcohol intake)
5. BP (systolic and diastolic)
6. Most recent serum creatinine, potassium and haemoglobin levels
7. Medical history (hypertension/diabetes and duration; other significant disease)
8. Presence of CKD complications (anaemia, hyperkalaemia, mineral bone disease, cardiovascular complications)
9. Current medication.

Data was analysed using SPSS version 20.

### Results

The study cohort had a male majority (1.4:1) with a median age of 62 years (range 22 to 85). The most common causes of CKD identified were hypertension (79.8 %) and diabetes (42.7 %). Other underlying aetiologies documented included glomerulonephritis (2.2%), chronic pyelonephritis (2.2%) and polycystic kidney disease (4.5%). 6.7% were found to have CKDu. 98.9% had documented complications of CKD with anaemia being the most common (89.9%).

### Discussion

The majority of patients had advanced CKD (stages 3 to 5). This may be because patients would only be diagnosed based on symptoms of deterioration, as national guidelines and screening programmes, e.g. annual albumin-creatinine ratio (ACR) monitoring in diabetic patients, are

lacking in Sri Lanka. Additionally the absence of primary healthcare within the public sector contributes to fewer patients being diagnosed with CKD at an earlier stage. Patient BMI and occupations did not show correlation with CKD severity, although individuals in some occupations, such as farming, may be susceptible to CKD through exposure to nephrotoxic agents.<sup>3,4</sup>

Hypertension and diabetes accounted for the majority of patients in this cohort, reflecting similar results to other studies.<sup>4</sup> The most cost-effective approach to reducing disease prevalence would be primary prevention through dietary modification and physical activity. Annual screening for proteinuria and medical management of hypertension, high glucose and dyslipidaemia are also essential.<sup>5</sup> A proportion of patients had CKDu, most of whom were unemployed or retired, suggesting an environmental or socio-economic influence.

Most of the study population suffered CKD complications, which may be associated with the advanced CKD majority, or that this ethnic group (Sri Lankan Tamils) may be more susceptible to macro- and microvascular disease than other ethnic groups.<sup>6</sup>

A greater proportion of anaemic patients had advanced CKD; this may be due to the older age demographic in later stages.<sup>7</sup> Mineral-bone disease was seen in the vast majority of patients. Metabolic acidosis was present in patients with CKD stages 4 and 5, with a significant proportion in the latter stage. The majority of patients with hyperkalaemia had CKD stage 5, however hyperkalaemia was not associated with reduced renal function.

There was no significant difference in the number of patients with cardiovascular disease between CKD stages. A limitation of this study was the inability to determine whether the presence of cardiovascular disease was a cause or complication of CKD.

### Conclusion

CKD is prevalent in Sri Lanka; the main aetiological factors contributing towards CKD development are diabetes and hypertension, with evidence of the latter also influencing disease progression. CKDu is a significant health problem in Sri Lanka and cases of CKDu have been found in this study. Larger-scale epidemiological studies should be conducted in the Northern Province to determine the true prevalence and cause of CKDu. Complications of CKD are common in this cohort so early detection and prevention are crucial towards improving prognosis and reducing the financial burden caused by the disease.

---

<sup>1</sup> Johnson S, Misra SS, Sahu R et al. Environmental contamination and its association with Chronic Kidney Disease of Unknown Etiology in North Central Region of Sri Lanka. CSE 2012. Available from: [http://www.cseindia.org/userfiles/sri\\_lanka\\_final\\_report.pdf](http://www.cseindia.org/userfiles/sri_lanka_final_report.pdf) (last accessed 30<sup>th</sup> August 2012)

<sup>2</sup> Athuraliya TN, Abeysekera DT, Amerasinghe PH et al. Prevalence of chronic kidney disease in two tertiary care hospitals: high proportion of cases with uncertain aetiology. Ceylon Med J 2009;54:23-5

<sup>3</sup> Wijewickrama ES, Weerasinghe D, Sumathipala PS et al. Epidemiology of chronic kidney disease in a Sri Lankan population: experience of a tertiary care center. Saudi J Kidney Dis Transpl 2011;22:1289-93

<sup>4</sup> Athuraliya NT, Abeysekera TD, Amerasinghe PH et al. Uncertain etiologies of proteinuric-chronic kidney disease in rural Sri Lanka. Kidney Int 2011;80:1212-21

<sup>5</sup> World Health Organization Media Centre Diabetes: the cost of diabetes. Available from: <http://www.who.int/mediacentre/factsheets/fs236/en/> (last accessed 25<sup>th</sup> August 2012)

<sup>6</sup> Chowdhury TA, Lasker SS. Complications and cardiovascular risk factors in South Asians and Europeans with early-onset type 2 diabetes. QJM 2002;95:241-6

<sup>7</sup> Robinson BE. Epidemiology of chronic kidney disease and anemia. J Am Med Dir Assoc 2006;7:S3-6