

The Threat Amongst Us - Significance and Scale of Diabetic Chronic Kidney Disease in Australia

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Abstract

This brief communication highlights the endemic issue of chronic kidney disease and diabetes in Australia, particularly the associated complication of diabetic nephropathy. It recognises the significant health care burden to the patient and society as well as the economic impact imposed by the morbidity and mortality of diabetic chronic kidney disease. This is particularly relevant to certain 'hot spots' in Australia as well as Indigenous communities. There is an urgent need to recognise chronic kidney disease as a significant burden by government and established funding bodies.

Key Words: Chronic Kidney Disease, Diabetes, Diabetic Nephropathy, Burden of disease, Health and Economic impact

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In 2011-12, an estimated 1.7 million Australian adults (10% of the total population) had clinical and biochemical features of Chronic Kidney Disease (CKD), with similar numbers of males and females ¹. As kidney disease is largely asymptomatic, the majority of people are unaware they have this chronic condition. Therefore, opportunistic testing in people with identifiable risk factors is of paramount significance to the individual's health and Australia's health economy. One of the leading risk factors for CKD is Diabetes Mellitus (DM), both type I and type II that, together with associated micro and macrovascular complications, have attained epidemic proportions, in Australia ². As the effects of these complications are multi systemic, involving the eyes, brain, heart, nerves and kidneys, the morbidity and mortality is high. This is illustrated by data from the 2011 Deloitte Access Economics report that showed, relative to healthy people, patients with diabetic kidney disease have a 79% increased risk of congestive heart failure, 41% increased risk of atherosclerotic vascular disease, and 56% increased risk of death ³. In fact the prevalence of CKD is about three times higher in those with diabetes compared to those without ⁴. One of the major microvascular complications of diabetic kidney disease is diabetic nephropathy (DN), characterized by persistent albuminuria, proteinuria, and/or eventual decline in kidney function (estimated glomerular filtration rate of less than 60ml/min per 1.73m²). These are the biochemical markers of DN present in 1 in 10 Australians ¹. Alarming, this figure is doubled to 1 in 5 for Indigenous Australians ⁵.

More than 40% of diabetic patients progress to DN, which in turn is a predominant cause of end stage renal disease (ESRD), often requiring long-term dialysis⁶. The greatest morbidity and cost burden associated with diabetic kidney disease is incurred when patients progress to ESRD and require dialysis or Renal Replacement Therapy (RRT). The annual per person health care cost for RRT is estimated to be \$73,527 - a cost almost three times higher than the annual per person cost of a heart attack³. Among patients with diabetic kidney disease, the rate of cardiovascular events is more than twice the rate of those with diabetes alone³. In fact cardiovascular causes are the leading cause of mortality in diabetic patients with kidney disease and this is more likely than the progression to ESRD⁷. Dishearteningly, the survival rate at five years, for those who do receive a transplant or go on to dialysis is worse than most common cancers⁸. These problems are projected to escalate given the increased longevity and growing epidemic of diabetes and obesity both in Australia and worldwide. Highlighting this concerning trend, is the fact that by 2025, the number of Australian adults (25+ years) who are obese is projected to exceed 6 million⁹, and almost 5 million Australians will be aged 65+ years¹⁰.

In 2014, a total of 22,218 people died from kidney-related diseases. This is equivalent to 60 people every day, or one person every 25 minutes¹¹. Given these startling numbers, it is not surprising that the fifth most common cause of death in Australia has been attributed to kidney and urinary diseases, accounting for 15 per cent of all deaths¹².

Apart from the medical burden of diabetes and its associated complications to patients, there is a tremendous financial cost to the healthcare system. On a spectrum, the approximate direct health care costs, per patient per annum, without diabetes is \$1700. For those with diabetes but no kidney disease it is about \$3000. Patients with early stages of

diabetic kidney disease the cost per annum is \$4000, while advanced stages of CKD this increases to \$10,000¹³ with an exponential rise to \$80,000 per annum for those with ESRD treated with dialysis. Given that diabetic CKD presents as such a spectrum, it is incredible that in 2012, the total costs attributable solely to CKD (excluding ESRD) were estimated at \$4.1 billion. This comprised of \$2.5 billion in direct healthcare costs, \$700 million in direct non-health care costs and \$900 million in government subsidies¹⁴. Similar data is reflected from the AusDiab study which illustrates that people with diabetes incur greater health care costs than those without, and that costs are further increased in those burdened with complications such as diabetic nephropathy¹⁵. Compounding this incremental health care cost with increasing stage of diabetic CKD, is the fact that diabetic ESRD costs more to treat with dialysis or transplantation, both on a cumulative and per person basis, than any other primary cause of ESRD¹⁶. In 2014-15, of the 10.2 million hospital admissions, the need for dialysis for ESRD was the single most common reason for care equating to over 1.3 million admissions¹⁷. The numbers are worse for Aboriginal and Torres Strait Islander peoples who are admitted to hospital for dialysis at 12 times the rate for other Australians¹⁷.

As highlighted by Kidney Health Australia, State of the Nation report the estimated prevalence of CKD in 'hot spots' such as the Illawarra-Shoalhaven area of New South Wales, is as high as 19.5%, almost double the national average¹¹. Other significant hotspots, based on the estimated number of adults with signs of CKD, are the south metropolitan area of Brisbane (QLD), the Hunter area north of Sydney (NSW) and the inner east area of Melbourne (VIC). According to the Australian Bureau of Statistics⁵, rates of Indigenous adults living with signs of CKD, across Australia, in very remote (37%) and remote areas (28%) are much higher compared with the 12% Indigenous adults living in major cities or

inner regional areas (13%). The pervasive nature of the spectrum of CKD, is revealed by the incidence of ESRD among Indigenous Australians, highest in the remote regions of Tenant Creek, Aputula and Jabiru in the Northern Territory, Warburton and Kalgoorlie in Western Australia and Ceduna in South Australia ¹⁸.

Despite the incredibly high health morbidity, mortality and economic costs, kidney disease is not highlighted as one of the 9 National Health Priority Areas (NHPA) by the Australian government. These 9 significant health conditions are listed on the Australian Institute of Health and Welfare website of which chronic kidney disease is only mentioned as a subset under Diabetes Mellitus. Given that the NHPA seeks to focus public attention and health policy on areas considered to impact significantly on burden of disease in Australia and for where there is potential for health improvement ¹⁹, it is paramount that kidney disease is listed not as a subset but emphasized as a main priority area, especially since there are a plethora of other aetiologies for CKD - not just diabetes. Now is an opportune time to reconsider this. Furthermore, NHPA underpin much of the research funded by the National Health and Medical Research Council (NHMRC) ²⁰. Kidney disease should not lag behind as a subset of Diabetes, but be considered as a tenth NHPA on its own accord, so that it receives the funding for research and translation activity warranted. After all, the NHMRC have highlighted a number of major health issues relevant to the next four years ²⁰. Specifically, the identified issues of improving the health of Aboriginal and Torres Strait Islander peoples, harnessing the power of new technologies to improve health care and addressing the social, environmental and community dimensions of health are very pertinent to chronic kidney disease.

As the brief overview highlights, diabetic kidney disease presents an enormous challenge to the Australian health system and its economy. Ongoing work to enhance primary and secondary prevention to help alleviate the morbidity and reduce the mortality at an individual, family and community level is paramount. A concerted effort by the community, health care system and government is vital to maximize more salubrious outcomes. It is vital that there is ongoing funding to organisations that support surveillance and research such as the Australian Institute of Health and Welfare (AIHW), Kidney Health Australia (KHA) and the NHMRC, to name a few. Increased government funding within this sphere of chronic kidney disease should be encouraged, especially in areas of discovery of new biomarkers for early detection, improved monitoring and treatments. Continued support for the recognition of the detrimental impact of CKD, reducing its progression to ESRD and investing in novel research to alleviate the health burden would certainly be in Australia's long-term national interest.

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