Available online at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe

Original Research

# Hidden prevalence of chronic kidney disease in hypertensive patients: the strategic role of primary health care

L.S. da Silva [a,*], R.M.M. Cotta [a], T.R. Moreira [b], R.G. da Silva [c], C. de O.B. Rosa [a], J.C. Machado [a], L.S. da Silva [d], M.A.P. Bastos [a]

[a] Department of Nutrition and Health, Federal University of Viçosa, Brazil
[b] Department of Nursing and Medicine, Federal University of Viçosa, Brazil
[c] Department of Nephrology, São João Batista Hospital, Viçosa, Brazil
[d] Medicine, Federal University Fluminense, Niteroi, Brazil

ARTICLE INFO

*Article history:*
Received 26 January 2015
Received in revised form
28 December 2015
Accepted 28 February 2016
Available online 29 March 2016

*Keywords:*
Chronic kidney disease
Hypertension
Prevalence
Prevention of diseases
Primary health care

ABSTRACT

*Objective:* To identify the hidden prevalence of chronic kidney disease (CKD) in hypertensive patients.
*Study design:* Cross-sectional study of individuals with systemic arterial hypertension (SAH) who were registered for primary health care (PHC).
*Methods:* In total, 293 individuals participated. Data were collected through interviews, as well as biochemical and anthropometric assessments. The CKD-EPI formula was used to identify the occurrence of CKD. Pearson's chi-squared test or Fisher's exact test were used to compare proportions. Prevalence ratios were estimated with a confidence interval of 95% for associations between the explanatory variables and CKD.
*Results:* Most of the individuals assessed were female (74%), elderly (69%), with a low income (90%), low education levels (84%) and overweight (66.9%). A CKD prevalence of 38.6% (95% CI: 33.0–44.2) was found and approximately 14% were at an advanced stage of the disease. Upon comparison of the variables in the different stages of CKD, statistically significant association could be suggested between CKD and age, education, alcohol intake, overweight individuals, cardiovascular risk, abnormal creatinine and abnormal microalbuminuria. When the prevalence ratio was assessed, association could be suggested between CKD and age, and CKD and creatinine.
*Conclusion:* The high hidden prevalence of CKD confirms the need to train health professionals involved in the treatment of SAH through PHC, enabling the prevention and diagnosis of CKD in its early stages.


* *Corresponding author*. Federal University of Viçosa, Department of Nutrition and Health, P. H. Rolfs Avenue, Code postal: 36571-000, Viçosa, Minas Gerais, Brazil.
E-mail addresses: lucianassnut@gmail.com (L.S. da Silva), rmmitre@ufv.br (R.M.M. Cotta), tiagoricardomoreira@gmail.com (T.R. Moreira), rodrigonefro@hotmail.com (R.G. da Silva), carla.rosa@ufv.br (C.O.B. Rosa), juboechat@yahoo.com.br (J.C. Machado), lucas.saraiva11@gmail.com (L.S. da Silva), marianaapbastos@gmail.com (M.A.P. Bastos).
http://dx.doi.org/10.1016/j.puhe.2016.02.029

## Introduction

Chronic kidney disease (CKD) has emerged as a serious public health problem worldwide. The prevalence of CKD has been increasing on a global scale, with an alarming annual increase of between 8% and 16%, which is greater than the growth of the general population.[1,2] In the USA, approximately 18% of the adult population, close to 28 million individuals, exhibited different stages of CKD in 2007.[3] In the elderly, the mean prevalence of CKD tends to increase and can reach up to 36%.[4] According to the Global Burden of Disease Study, CKD came in 18th place on a list of the greatest causes of death in the world in 2010, with an annual mortality rate of 16.3 per 100,000 people.[5]

In Brazil, 10 million individuals have some degree of renal abnormality. This is aggravated by the fact that the disease is unknown by many patients. In addition, 52 million people are particularly vulnerable to the development of this disease due to the fact that they are elderly, obese, smokers or have systemic arterial hypertension (SAH) or diabetes – the most likely groups to have kidney problems. CKD generates costs of approximately 1.4 billion reals per annum and it is significant that 84% of the treatment is financed by the public health sector – *Sistema Único de Saúde* (SUS).[6]

Bearing in mind that SAH is the main risk factor for the development and progression of CKD, and considering that only 15% of SAH patients have adequately controlled blood pressure, it is possible to conclude that 85% have the potential to develop some degree of kidney failure. This suggests that SAH will continue to be a significant cause of CKD in years to come,[7] particularly because of the persistence of inadequate eating habits, physical inactivity and smoking.[8]

It is important to note that CKD often progresses silently until its most advanced stages and when the individual eventually seeks health care, they already exhibit one or more complications of the disease.[9] Studies have shown that these undesirable outcomes could be prevented or delayed if CKD was diagnosed earlier and nephroprotective and cardioprotective measures are immediately taken.[10,11] The prevention of injuries and illnesses by early diagnosis and CKD treatment is also fundamental in decreasing individual contributions to renal replacement therapy (RRT) and reducing costs.

The Kidney Disease: Improving Global Outcomes (KDIGO) group develops evidence-based approaches to providing care to kidney patients.[11] The International Society of Nephrology (ISN), through its Global Outreach Research and Prevention Committee, has focused on demonstrating that early detection and prevention programs can be carried out cost effectively in very resource-poor settings using the CKD, SAH, Diabetes and Cardiovascular Disease template.[12]

For the detection, according to current policies, persistent proteinuria is the principal marker of kidney damage. Other markers of damage include abnormalities in urine sediment, abnormalities in blood and urine chemistry measurements, and abnormal findings on imaging studies. Glomerular filtration rate (GFR) is the best measure of overall kidney function in health and disease. Persons at increased risk for developing CKD should undergo testing to identify markers of kidney damage and to estimate the GFR.[11] Nowadays, it is recommended to estimate the GFR using the Chronic Kidney Disease Epidemiology Collaboration Equation (CKD-EPI).[11,13,14]

Each patient with CKD should have a clinical action plan, based on the stage of disease, as defined by the KDIGO guidelines. All patients with CKD and persons at increased risk for CKD should undergo measurement of proteinuria and GFR.[11]

Unfortunately, CKD has generally been under-diagnosed and inadequately treated, resulting in unfavourable developments and high treatment costs.[15] It is estimated that almost 60% of CKD cases do not gain access to the RRT as they result in death during the primary health care (PHC) phase, often without a clear diagnosis.[16] On average, 30% of advanced CKD carriers are sent for medium complexity level nephrology care when it is already too late, which increases morbidity and mortality.[10] In Brazil, CKD care is almost exclusively restricted to the most advanced stage of the disease, when the patient requires RRT.[6]

In this context, professionals working in PHC have important role in early diagnosis, monitoring and referral of patients to specialists when necessary. The PHC is the gateway of individuals in health services and the coordinating center of health care. The adoption of the Family Health Strategy (FHS) as PHC priority policy in Brazil, due to its configuration and work process, incorporates the most favourable conditions for access the multisectoral and integrated approach measures of chronic non-communicable diseases (NCD)[17] as CKD.

Regardless of the underlying aetiology of the CKD, the PHC can make a significant impact in slowing the progression of CKD through strict blood pressure control, tight glycaemic control, reduction in the degree of proteinuria, facilitate physical activity, promote a healthy diet, reduce harmful use of alcohol and smoking cessation. All CKD patients are at significantly increased risk of cardiovascular events; therefore, additional cardiovascular risk factors such as hyperlipidaemia should be managed aggressively.[18]

These data demonstrate the need for new research to assess the role of PHC in the detection and adequate management of CKD, which will enable the establishment of strategies to prevent injuries and illnesses, thereby contributing to the formation of public policies by governments.

The aim of the present study was to identify the hidden prevalence of CKD in individuals with SAH who were registered for PHC.

## Methods

This cross-sectional study was conducted between June 2012 and October 2013, assessing SAH patients registered and monitored by the FHS in the town of Porto Firme in Minas Gerais (MG), Brazil.[19]

The present study was carried out in the PHC unit in the urban area of Porto Firme, which contains two family health teams. There are 697 SAH carriers registered in the primary care information system.[20] At the time of the present study, approximately 300 individuals were being monitored by the PHC, according to the town council.