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Prevalence evaluation of Chronic Kidney Disease in diabetic and/or hypertensive patients assisted at the outpatient care of Faculdade de Ciências Médicas de Minas Gerais

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ABSTRACT

Introduction: Chronic Kidney Disease (CKD) is a worldwide public health problem, affecting 8-16% of the world's population and with rising prevalence. The diagnosis of CKD comprises assessment of albuminuria, serum creatinine levels and the calculation of the Glomerular Filtration Rate (GFR). Systemic Arterial Hypertension (SAH) and Type 2 Diabetes Mellitus (DM2) stand out among the risk factors for the development of CKD. Therefore, evaluating people at risk, who are unaware of their kidney health, is vital to improve the prognosis and carry out referrals according to the recommendations of the Unified Health System (SUS). **Objective:** To determine the prevalence of CKD in individuals with hypertension and/or DM2**. Methods:** This is a descriptive, observational, and cross-sectional study, carried out in an outpatient clinic of a medical school in Belo Horizonte. The renal function of hypertensive and diabetic patients was evaluated and classified, totaling 97 patients. **Results:** Of the participants, 48% had GFR G1 (> 90 ml/min/1.73m²), 27% G2 (60-89 ml/min/1.73m²), 13% G3a (45-59 ml/min/1 .73m²), 9.3% G3b (30-44 ml/min/1.73m²) and 2.1% G4 (15-29 ml/min/1.73m²). **Conclusion:** Among the total participants, 52% experienced a reduction in GFR, and 2.1% had a severe drop. The findings of the study align with previous research indicating that DM2 and hypertension are risk factors for CKD. While the study is limited by its sample size, it underscores the importance of assessing kidney function in patients with chronic diseases. Conducting additional studies may unveil further associations between common comorbidities and kidney disease, ultimately enhancing patient care.

Keywords: Chronic Kidney Disease; Creatinine; Glomerular Filtration Rate.

INTRODUCTION

Chronic Kidney Disease (CKD), according to the Guidelines for Evaluation and Management of Chronic Kidney Disease in Clinical Practice (kidney disease: Improving Global Outcomes–KDIGO), is defined as the presence of abnormalities in kidney structure and/or function for more than three months, with implications for individual health [1]. Currently, this comorbidity is considered a global public health problem, and its prevalence is increasing

globally, with an estimated prevalence of 8-16% worldwide and defined as the sixteenth cause of years of life lost [2–4]. The data provided by the Brazilian Dialysis Census showed an accelerated growth in the incidence and prevalence rates of CKD in Brazil. In the year 2020, the number of patients on Renal Replacement Therapy (RRT) reached the mark of 144,779[5].

For the diagnosis of CKD, criteria such as glomerular filtration rate (GFR), albuminuria, the presence of electrolyte disturbances due to tubular injuries, findings of abnormalities in histological or imaging tests, and a history of renal transplantation are used. The presence of any of the criteria for a period longer than three months can be considered indicative of CKD[1,6].

Despite the availability of various parameters, it is recommended to assess renal involvement through the evaluation of microalbuminuria, primarily using the urinary albumin/creatinine ratio (UACR), and the assessment of renal excretion function through the glomerular filtration rate (GFR), using serum creatinine values in one of the various available equations. GFR is considered altered when values are <60 mL/min/1.73m², while microalbuminuria is considered altered when indices exceed 30 mg/24hrs or UACR of 30 mg/g. Based on these values, patients can be categorized into profiles predicting the prognosis of CKD. This categorization is based on GFR (G1, G2, G3a, G3b, G4, and G5), as demonstrated in Table 1, and persistent albuminuria[1,7].

Table 1– Classification of CKD according to GFR

Categories by GFR	GFR (ml/min/1.73m²)	Stage
G1	≥ 90	Normal or high
G2	60 – 89	Slightly decreased*
G3a	45 – 59	Mild to moderately decreased
G3b	30 – 44	Moderately to severely decreased
G4	15 – 29	Severely decreased
G5	< 15	End-stage kidney disease

* Relative to the level of young adults in the absence of evidence of kidney damage. (KDIGO, 2013)
CKD: chronic kidney disease; GFR: glomerular filtration rate

The Brazilian Unified Health System (SUS) plays a significant role in the care and treatment of patients with CKD, being responsible for financing 90% of the interventions performed on individuals in need of Renal Replacement Therapy (RRT), which includes dialysis and kidney transplantation. In 2015, approximately 60 million *reais* were invested in laboratory tests for serum creatinine and 24-hour proteinuria to identify, monitor, and treat CKD. It becomes evident, therefore, that the increasing prevalence of CKD contributes to the burden on the Brazilian Healthcare System, which invested around 2 billion *reais* solely in the treatment of stage 5 CKD in the year 2015[8]. This reality underscores the need to encourage early diagnosis of CKD, despite being asymptomatic or oligosymptomatic in initial stages, so that with appropriate therapeutic measures, the costs and suffering of patients can be reduced[9].

According to Dallacosta and Mitrus (2017), CKD has a multifactorial nature. Thus, genetic, environmental, metabolic, and hemodynamic factors, acting together, can interfere with renal functionality [9,10]. According to data from the Brazilian Society of Nephrology (SBN), the main underlying diagnoses of patients on dialysis are Systemic Arterial Hypertension (SAH)

and/or Diabetes Mellitus (DM). This fact elucidates that the presence of other comorbidities may influence and favor the development of CKD, with both non-communicable chronic diseases being the major etiologies associated with an unfavorable progression of renal function [11-13].

Given the substantial risk factors associated with CKD, it is recommended that all hypertensive and/or diabetic patients, regardless of symptoms, undergo regular evaluations including urine tests, albuminuria assessment, serum creatinine measurement, and calculation of GFR, analyses considered screening measures aimed at early diagnosis [4,14].

Considering the increasing incidence and prevalence of CKD in Brazil and worldwide, there is a clear need for further investigation and data collection related to patients presenting risk factors for the development of CKD, as many patients are unaware of the disease in its early stages. A study by Alves et al. (2017) revealed a surprising prevalence of 16.0% of CKD in patients with hypertension, many of whom were previously unaware of this diagnosis. Additionally, the results indicated a prevalence of 17.3% of CKD in high-risk hypertensive patients with cardiovascular diseases and/or diabetes, registered in the Hiperdia program in a city in the interior of Minas Gerais [15]. These findings reinforce the importance of active surveillance and early treatment of CKD, especially in patients with hypertension and diabetes, to prevent serious renal complications [11,15-17].

Therefore, it is possible to implement health promotion and prevention measures capable of preventing the development or delaying the progression of the disease to advanced stages. Diagnosing and treating CKD in its early stages helps reduce the burden on the SUS, as well as sparing patients from dealing with possible complications, such as end-stage CKD and the need for RRT [4,18].

Considering the foregoing, the present study aims to investigate the prevalence of CKD in patients with hypertension and type 2 diabetes mellitus (DM2) treated at the Outpatient Clinic of the Faculty of Medical Sciences of Minas Gerais. The specific objectives include evaluating serum creatinine levels, estimating GFR through calculation based on serum creatinine, determining the stage of CKD based on GFR results, and assessing the prognosis of CKD according to GFR categories. Additionally, the study aims to contribute to the assessment of CKD presence in patients with previously associated risk factors.

METHOD

Study Design

This is a cross-sectional observational study conducted from November 2022 to July 2023.

Ethical Aspects

The study was approved by the Research Ethics Committee and is in accordance with Resolution 466/12 of the National Health Council, under CAAE 62607122.5.0000.5134.

Sample

Patients who met the diagnostic criteria for DM and hypertension (HAS) and were receiving medical follow-up at the Outpatient Clinic of the Faculty of Medical Sciences of Minas Gerais were selected.

The diagnostic criteria for DM were based on fasting plasma glucose ≥ 126 mg/dL (8 hours), fasting and 2-hour post-oral glucose overload (oral glucose tolerance test–OGTT) ≥ 200 mg/dL, or values ≥ 200 mg/dL in casual plasma glucose measurement [19].

Criteria for the diagnosis of hypertension were based on consistently elevated blood pressure levels above normal limits in two or more measurements taken during office visits, following the guidelines for measurement. A patient is considered hypertensive when the

BP value is equal to or greater than 140/90 mmHg in consecutive measurements [20].

Among patients who already had the comorbidities described in the medical records, the following inclusion criteria were used: being 18 years of age or older, having a diagnosis of DM and/or hypertension, and agreeing to participate in the research by signing the Informed Consent Form (ICF). The following exclusion criteria were applied: acute illnesses, neoplasms, pregnancy and postpartum period, inability to sign the ICF, and absence of recorded serum creatinine laboratory test results in the medical records.

Instruments and Procedures

After identifying patients who met the inclusion criteria of the study and agreed to the proposed terms in the informed consent form (ICF), a retrospective analysis of the patient's medical records was conducted to identify the results of the latest laboratory tests for serum creatinine with GFR calculation. Furthermore, the standard questionnaire for necessary information collection was filled out by the researchers.

The implementation of the procedures allowed for the analysis of renal function in patients who already present significant risk factors for the development of CKD. Thus, it was possible to evaluate the renal function of each patient, the prognosis of renal disease, and the disease risk classification.

The covariates of the study were assessed through a sociodemographic and clinical questionnaire authored by the researchers, including: age, sex, weight, height, body mass index (BMI), history of renal involvement, levels of systolic and diastolic blood pressure, information on smoking, physical inactivity, and alcohol consumption.

Patients were weighed and measured using an anthropometric scale. Systolic and diastolic blood pressure levels were measured once on the day of signing the informed consent form (ICF). Patients who identified themselves as smokers responded affirmatively to the question regarding their smoking habits. Sedentary behavior was defined as the absence of physical exercise reported by patients in the last three months. Regarding alcohol consumption assessment, a positive response was recorded if patients reported current consumption, regardless of quantity or frequency.

Statistical Analysis of Results

Categorical variables were presented as absolute and relative frequencies, while numerical variables were presented as mean ± standard deviation and/or median (1st quartile–3rd quartile). Numerical variables were subjected to the Shapiro-Wilk normality test, and for possible comparisons of means/medians between independent groups, the independent t-test or Mann-Whitney test was used. For feasible comparisons between paired groups, the paired t-test or Wilcoxon test was used.

To assess possible associations between categorical variables, the chi-square test was used for independent variables, and the McNemar test was used for paired variables. A significance level of 5% was used, and the data were analyzed using R software version 4.0.3.

The sample was described using simple frequencies and percentages for qualitative variables, while quantitative variables were presented with median and interquartile range. To evaluate the association between the qualitative variables of interest, association tests were applied, including the Fisher's exact test and the chi-square test for independence. For quantitative variables, non-parametric tests such as the Wilcoxon rank-sum test were used to determine if there were significant differences between groups based on the median. Additionally, the Kruskal-Wallis test was employed to compare the distribution of three or more independent samples without making assumptions about the data distribution.

RESULTS

A total of 97 patients were evaluated, of whom 73% were female and 27% were male. The median age was found to be 64 years, with the first quartile being 58 years and the third quartile being 72 years, as elucidated in Table 2. This table presents the simple frequencies and percentages associated with qualitative variables, as well as the median and interquartile range for quantitative variables.

Table 2–Sample Description

Characteristics	N = 97[1]
Female	71 (73%)
Male	26 (27%)
Age	64 (58, 72)
Weight	75 (67, 87)
Height	1.63 (1.56, 1.70)
BMI	28.8 (24.4, 32.9)
Systolic BP	130 (120, 150)
Diastolic BP	90 (80, 90)
No Kidney Disease	86 (89%)
Kidney Disease Present	11 (11%)
Non-smoker	89 (92%)
Smoker	8 (8.2%)
Sedentary	60 (62%)
Claims Physical Activity Practice	37 (38%)
Denies Alcohol Consumption	71 (73%)
Claims Alcohol Consumption	26 (27%)
DM Carrier (CID E14)	5 (5.2%)
Hypertension Carrier (CID I10)	38 (39%)
DM and Hypertension Carrier (CID E14 and I10)	54 (56%)
Serum Creatinine	0.82 (0.70, 1.02)
GFR G1	47 (48%)
GFR G2	26 (27%)
GFR G3a	13 (13%)
GFR G3b	9 (9.3%)
GFR G4	2 (2.1%)
GFR G5	0 (0%)

[1]n (%); Median (IQR) / GFR: Glomerular Filtration Rate; DM: Diabetes Mellitus; BMI: Body Mass Index; BP: Blood Pressure.

Additionally, the median weight was 75 kg, and the mean BMI was 28.8. The median systolic blood pressure was 130, with the first quartile being 120 and the third quartile being 150. The median diastolic blood pressure was 90, with the first quartile being 80 and the third quartile being 90.

Among the interviewed patients, 89% reported not being affected by kidney diseases, while 11% reported being kidney disease patients. It is also noteworthy that 8.2% of the 97 patients are considered smokers, and 38% of the patients do not engage in physical activities, while 27% consume alcoholic beverages.

Furthermore, it was observed that 56% of the patients have both hypertension and diabetes mellitus simultaneously, while 39% have only hypertension and 5.2% have only diabetes mellitus.

When investigating possible correlations between pathologies such as diabetes mellitus and systemic arterial hypertension, as well as the influence of factors such as physical activity, patient's sex, and smoking on the occurrence of previous kidney disease, no sample evidence was found to support, at the 5% significance level, the statistical association between these variables of interest and the presence of any previous renal involvement (Table 3).

Table 3- Association between kidney disease and other study variables.

Characteristics	Total, N = 97[1]	No N = 86[1]	Yes N = 11[1]	p[2] value
Female	71 (73%)	63 (73%)	8(73%)	>0.9
Male	26 (27%)	23 (27%)	3 (27%)	>0.9
Non-smoker	89 (92%)	78 (91%)	11 (100%)	0.6
Smoker	8 (8.2%)	8 (9.3%)	0 (0%)	0.6
Sedentary	60 (62%)	52 (60%)	8 (73%)	0.5
Claims Physical Activity Practice	37 (38%)	34 (40%)	3 (27%)	0.5
DM Carrier (CID E14)	5 (5.2%)	5 (5.8%)	0 (0%)	0.9
Hypertension Carrier (CID I10)	38 (39%)	33 (38%)	5 (45%)	0.9
DM and Hypertension Carrier (CID E14 e I10)	54 (56%)	48 (56%)	6 (55%)	0.9
BMI	28.8 (24.4, 32.9)	28.8 (23.9, 33.0)	29.2 (25.6, 32.0)	0.5
Systolic BP	130 (130, 150)	130 (130, 150)	140 (125, 153)	0.8
Diastolic BP	90 (80, 90)	90 (80, 90)	88 (75, 90)	0.6

[1]n (%); Median (IQR) / [2]Fisher's Exact Test; Wilcoxon Rank Sum Test / DM: Diabetes Mellitus; BMI: Body Mass Index; BP: Blood Pressure.

Regarding possible correlations for disease occurrence, the BMI of the patients as well as the systolic and diastolic blood pressures presented by them were analyzed. As elucidated in the table above (Table 3), no significant p-value was found to determine that the medians are different between the groups.

Table 4, on the other hand, presents an analysis of the association of Glomerular Filtration Rate (GFR) with various variables, including sex, smoking, physical activity, presence of diseases such as diabetes mellitus (DM), systemic arterial hypertension (SAH), and renal disease, as well as body mass index (BMI) and blood pressure (BP) at the time of assessment. Thus, with a significance level of 5%, a statistically significant association was identified between the renal disease condition and the classification of GFR, specifically, among patients without renal disease, there was an association with GFR classification denoted as G1. This fact is in line with the definition of chronic kidney disease stages. Regarding the other variables, no significant association was found.

Additionally, the results found in Table 5 suggest that the presence of DM and SAH is significantly associated with specific BMI categories, with a higher prevalence of obesity in patients with these conditions. On the other hand, there was no significant association between the presence of renal disease and BMI in this sample.

Table 4- Association of GFR with other variables

Characteristics	Total N = 97[1]	G1 N = 47[1]	G2 N = 26[1]	G3a N = 13[1]	G3b N = 9[1]	G4 N = 2[1]	p[2] value
Female	71 (73%)	35 (74%)	20 (77%)	9 (69%)	5 (56%)	2 (100%)	0.7
Male	26 (27%)	12 (26%)	6 (23%)	4 (31%)	4 (44%)	0 (0%)	0.7
Non-smoker	89 (92%)	41 (87%)	24 (92%)	13(100%)	9 (100%)	2 (100%)	0.6
Smoker	8 (8.2%)	6 (13%)	2 (7.7%)	0 (0%)	0 (0%)	0 (0%)	0.6
Sedentary	60 (62%)	29 (62%)	18 (69%)	6 (46%)	5 (56%)	2 (100%)	0.6
Claims Physical Activity Practice	37 (38%)	18 (38%)	8 (31%)	7 (54%)	4 (44%)	0 (0%)	0.6
DM Carrier (CID E14)	5 (5.2%)	4 (8.5%)	1 (3.8%)	0 (0%)	0 (0%)	0 (0%)	0.6
Hypertension Carrier (CID I10)	38 (39%)	18 (38%)	12 (46%)	6 (46%)	1 (11%)	1 (50%)	0.6
DM and Hypertension Carrier (CID E14 e I10)	54 (56%)	25 (53%)	13 (50%)	7 (54%)	8 (89%)	1 (50%)	0.6
No Kidney Disease	86 (89%)	43 (91%)	26(100%)	10 (77%)	7 (78%)	0 (0%)	0.001
Kidney Disease Present	11 (11%)	4 (8.5%)	0 (0%)	3 (23%)	2 (22%)	2 (100%)	0.001
BMI	28.8 (24.4, 32.9)	29.5 (24.6, 32.3)	26.5 (24.6, 33.5)	26.2 (21.7, 28.9)	27.3 (25.2, 33.3)	26.9 (26.9, 26.9)	0.7
Systolic BP							
130 (130, 150)							
130 (130, 150)					160 (130, 180)	145 (133, 158)	0.2
130 (130, 140)							
140 (130, 150)							
Diastolic BP	90 (80, 90)	90 (80, 90)	90 (80, 90)	80 (70, 90)	80 (75, 90)	85 (78, 93)	0.4

[1]n (%); Median (IQR) / [2]Fisher's Exact Test; Kruskal-Wallis Test / GFR: Glomerular Filtration Rate; DM: Diabetes Mellitus; BMI: Body Mass Index; BP: Blood Pressure.

Table 5- Association between BMI, HTN, DM, and kidney disease

Characteristics	Total N=65[1]	Normal Weight N = 28[1]	Pre-Obesity N = 0[1]	Obesity Grade I N = 23[1]	Obesity Grade II N = 14[1]	Obesity Grade III N = 0[1]	p[2] value
DM Carrier (CID E14)	4 (6.2%)	3 (11%)	0 (0%)	1 (4.3%)	0 (0%)	0 (0%)	0.038
Hypertension Carrier (CID I10)	24 (37%)	15 (54%)	0 (0%)	6 (26%)	3 (21%)	0 (0%)	0.038
DM and Hypertension Carrier (CID E14 e I10)	37 (57%)	10 (36%)	0 (0%)	16 (70%)	11 (79%)	0 (0%)	0.038
No Kidney Disease	59 (91%)	27 (96%)	0 (0%)	19 (83%)	13 (93%)	0 (0%)	0.3
Kidney Disease Present	6 (9.2%)	1 (3.6%)	0 (0%)	4 (17%)	1 (7.1%)	0 (0%)	0.3

[1]n (%) / [2]Fisher's Exact Test / DM: Diabetes Mellitus

DISCUSSION

The main objective of this study was to investigate the prevalence of chronic kidney disease (CKD) in patients with Systemic Arterial Hypertension (SAH) and/or Type 2 Diabetes Mellitus (DM2). From the data analysis, 52% of the patients showed a reduction in glomerular filtration rate (GFR), and 24.4% had a GFR less than 60 ml/min/1.73m², which is considered a moderate decrease in renal function and supports a possible diagnosis of chronic kidney disease [1,21].

It is important to highlight that CKD not only poses a burden on the Unified Health System but also results in considerable suffering and necessitates invasive procedures for patients in advanced stages of the disease. In 2016, the prevalence of CKD was estimated at 8-16% worldwide [3,4], while in the present study, a reduction in GFR was observed in 52% of the studied sample, which includes patients with isolated hypertension and this comorbidity associated with type 2 diabetes mellitus (DM2). Although reduced GFR values do not necessarily confirm a diagnosis of CKD, it is known that the decrease in glomerular filtration rate, if not addressed, can lead to unfavorable outcomes. Therefore, the findings are consistent with one of the diagnostic components that encompass chronic kidney disease.

Despite the noticeable expansion of the disease, Brazil still lacks studies that assess the prevalence of non-dialytic CKD patients according to the new disease definition [22]. Additionally, considering the current trends of increasing CKD prevalence in Brazil, it is possible to foresee that the provision and maintenance of Renal Replacement Therapy will be a public health issue. Studies have shown that the funds invested by the Unified Health System (SUS) in hospitalizations due to advanced CKD increased by approximately 16% from 2013 to 2015 [8].

CKD is an independent risk factor for cardiovascular diseases, cognitive dysfunction, and hospitalization, besides increasing mortality in affected individuals [7]. The Brazilian Society of Nephrology (SBN) suggests that by the year 2040, CKD might become the fifth leading cause of death worldwide [23]. Chronic kidney

disease patients may develop anemia due to erythropoietin deficiency, as the reduction in GFR negatively impacts the production of this hormone. Moreover, the progressive decrease in glomerular filtration is associated with alterations in mineral metabolism, metabolic acidosis, and electrolyte disturbances [7].

For patients with CKD, the judicious use of drugs and special attention to the adjustment of doses of potentially nephrotoxic medications are necessary, as renal excretion is compromised in these cases. Finally, it is important to note that the clinical implications of CKD are dependent on the degree of reduction in GFR and the stage of the disease, and that patients in early stages may often be asymptomatic [7].

The main etiologies of chronic kidney disease (CKD) in Brazil and worldwide are Diabetes Mellitus (DM) and Systemic Arterial Hypertension (SAH), comorbidities that represent a significant concern for healthcare professionals. SAH affects approximately 25% of the Brazilian adult population, while DM affects about 6% [6]. Therefore, the present study aimed to investigate chronic kidney disease in patients with these pathologies, not only because they are the main risk factors but also due to their high prevalence in Brazil and worldwide. It is worth noting that the prognosis of CKD in diabetic and hypertensive patients without treatment optimization is reduced.

A study conducted by Soares et al. (2018) in 2017 in the municipality of Ubá-MG highlighted that DM2 is the second most prevalent comorbidity in patients undergoing Renal Replacement Therapy, affecting approximately 34% of hemodialysis patients in the municipality, surpassing the national average of 29% in 2012 [22]. Despite DM2 being a known risk factor for CKD, the population of diabetic patients in the present study does not reflect the prevalence data of this pathology in Brazil, as the studied sample is small, heterogeneous, and divergent from the population included in the study conducted in Ubá-MG. The fact that only 5 diabetic patients comprised the sample and only 1 of them had a decline in GFR corroborates an imprecise and undervalued result regarding the evidence correlating the two clinical conditions.

The same study evidenced that hypertension is the most significant risk factor for the progression of renal disease in both diabetic and non-diabetic populations, being responsible for 92% of cases [24]. In this research, comparatively, the prevalence of decreased GFR in hypertensive patients was 20.62%, in diabetic patients it was 1.03%, while in hypertensive and diabetic patients it was 29.9%. Despite being based on a small sample compared to the population in the study by Soares et al., the data also demonstrate that there is a relationship between hypertension, DM, and compromised renal function, and that arterial hypertension is the most important and prevalent risk factor.

Considering that Chronic Kidney Disease (CKD), especially in its early stages, can manifest in various ways, with very nonspecific signs and symptoms or even the absence of symptoms, its early diagnosis is challenging [8,25]. Therefore, the importance of screening tests, especially in individuals with risk factors, is highlighted, so that preventive actions, with diagnosis and treatment in the early stages of the disease, can be performed [9]. During the interview with the patients and the analysis of their respective medical records, several individuals with risk factors for CKD had not undergone screening tests. For example, the values of microalbuminuria were not available in the medical records because they had not been requested, which made it difficult to fully meet the diagnostic criteria and, therefore, to make a reliable analysis of CKD patients. Thus, it is possible to infer that a large portion of the analyzed patients are underdiagnosed due to the lack of necessary tests for the effective diagnosis of CKD.

As mentioned previously, the diagnostic criteria for CKD encompass multiple factors such as glomerular filtration rate (GFR), the presence of albuminuria, electrolyte imbalances resulting from tubular lesions, abnormalities detected in histological or imaging tests, and a history of kidney transplantation. It is important to mention that the continuous presence of any of these criteria for a period longer than three months indicates the existence of CKD, as defined by KDIGO in 2013[1].

In addition, we decided to explore other variables, including smoking, obesity, and sedentary lifestyle, which are commonly associated with various chronic diseases and may potentially be correlated with kidney disease and decreased GFR. From the statistical analysis conducted with the qualitative variables, the cross-referencing of the variables of interest with the variable of kidney disease did not show, at the 5% significance level, evidence that these risk factors were related to CKD. Although, the latest KDIGO (Kidney Disease Improving Global Outcomes) guideline from 2013– Guidelines for the Evaluation and Management of Chronic Kidney Disease in Clinical Practice mentions the three variables mentioned above as risk factors for CKD and suggests a comprehensive evaluation of these to predict the prognosis and progression of the disease[1]. Some of the criteria defined by KDIGO, such as structural abnormalities defined by biopsy, presence of albuminuria, abnormalities in imaging tests of the urinary tract, and the presence of electrolyte disturbances, were not addressed in this study [1]. This suggests that the number of 50 people who showed a reduction in glomerular filtration rate among the 97 surveyed is underestimated.

Lastly, it is important to note that the sample analyzed in this article may not be representative or directly comparable to established data on the prevalence of CKD in hypertensive and diabetic patients in Brazil and worldwide. Nonetheless, a positive association was observed between reduced GFR and these comorbidities, although not statistically significant in this stud. Thus, it can be deduced that the disparity in the results primarily stems from the limited and diverse nature of the studied sample.

CONCLUSION

In conclusion, the essence of this study was to investigate the occurrence of chronic kidney disease (CKD) in individuals with Systemic Arterial Hypertension (SAH) and/or Type 2 Diabetes Mellitus (DM2). This investigation is essential due to the epidemiological relevance of these conditions, which significantly impact the healthcare system. While the research findings align with established guidelines and results from robust studies in the literature, no statistically significant correlation was observed between the variables studied and CKD. Therefore, these findings should not be solely relied upon for clinical decision-making. We can infer that the disparity in results was mainly attributed to the limited size and heterogeneous nature of the sample used in the study.

Although the study's results did not meet the initial objective, it is important to acknowledge that the literature consistently identifies Systemic Arterial Hypertension (SAH) and Type 2 Diabetes Mellitus (DM2) as risk factors for chronic kidney disease. Therefore, the significance of screening tests in these patients cannot be overstated, as they play a crucial role in mitigating potential adverse outcomes. There is also an urgent need for additional research to investigate other comorbidities associated with CKD, always seeking the well-being of patients, improvement of quality of life, and reduction of burden on the Brazilian healthcare system.

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THE AUTHORS DECLARE THAT THERE IS NO CONFLICT OF INTERESTS IN RELATION TO THIS ARTICLE.