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Knowledge regarding the prevention of chronic kidney disease in hypertensive and diabetic patients: a cross-sectional study

Conhecimento sobre a prevenção da Doença Renal Crônica em hipertensos e diabéticos: estudo transversal

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Abstract

Introduction: Hypertension (HT) and diabetes mellitus (DM) lead to functional and structural changes in target organs such as the kidneys, characterizing the need for preventive actions to avoid Chronic Kidney Disease (CKD). **Objective:** To verify cardiologists' and endocrinologists' knowledge, indications and practices regarding prevention of CKD in patients with HT and DM. **Methods:** A cross-sectional study with 14 cardiologists and 5 endocrinologists applying a questionnaire about the conduct of these professionals regarding the prevention of CKD in hypertensive and diabetic patients. **Results:** One hundred percent of the cardiologists and endocrinologists did not request specific tests for CKD screening (albuminuria and glomerular filtration rate (GFR), although 92.9% of the cardiologists and 60.0% of the endocrinologists report referring hypertensive and diabetic patients with impaired renal function to nephrologists. One hundred percent of the interviewees recognize the importance of physical exercise for their patients; however, only 68.6% of cardiologists and 60% of endocrinologists indicated a physiotherapist and/or physical trainer to implement these exercises. **Conclusion:** The professionals evaluated in this study do not request microalbuminuria and GFR examinations for hypertensive and diabetic patients as a follow-up routine, despite having found cases of renal function impairment in these patients; in contrast to what is proposed in the guidelines for hypertension and diabetes mellitus. They recognize the importance of physical exercise and report

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indicating their patients to a physiotherapist and/or physical trainer. We suggest continuing the study in order to ascertain the reasons for their not complying with the respective guidelines.

Keywords: Disease Prevention. Comprehensiveness in Health Care. Chronic Disease. Hypertension. Diabetes Mellitus.

Resumo

Introdução: *A hipertensão arterial (HAS) e o diabetes mellitus (DM) ocasionam alterações funcionais e estruturais de órgãos alvo como os rins, caracterizando a necessidade de ações preventivas para evitar a Doença Renal Crônica (DRC).* ***Objetivo:*** *Verificar o conhecimento, indicação e prática de condutas dos cardiologistas e endocrinologistas quanto a prevenção de DRC em pacientes com HAS e DM.* ***Métodos:*** *Estudo transversal realizado com 14 cardiologistas e 5 endocrinologistas, através de questionário referente a conduta desses profissionais quanto a prevenção da DRC entre hipertensos e diabéticos.* ***Resultados:*** *Cem por cento dos cardiologistas e endocrinologistas não solicitam os exames específicos para o rastreamento da DRC (albuminúria e estimativa da taxa de filtração glomerular - TGF), embora 92,9% dos cardiologistas e 60,0% dos endocrinologistas relatem encaminhar pacientes hipertensos e diabéticos com comprometimento da função renal ao nefrologista. Cem por cento dos entrevistados reconhecem a importância do exercício físico para seus pacientes, no entanto, apenas 68,6% dos cardiologistas e 60% dos endocrinologistas indicam o fisioterapeuta e ou educador físico para a realização dos mesmos.* ***Conclusão:*** *Os profissionais avaliados neste estudo não solicitam exames microalbuminúria e de TFG para pacientes hipertensos e diabéticos como rotina de acompanhamento, embora tenham encontrado casos de comprometimento da função renal nesses pacientes, diferentemente do proposto nas diretrizes para hipertensão arterial e diabetes mellitus. Reconhecem a importância do exercício físico e referem indicar seus pacientes ao fisioterapeuta e ou educador físico. Sugerimos continuidade do estudo a fim de averiguar as razões para o não cumprimento das respectivas diretrizes.*

Palavras-chave: *Prevenção de Doenças. Integralidade em Saúde. Doença Crônica. Hipertensão Arterial. Diabetes Mellitus.*

Introduction

Cardiovascular and metabolic diseases are responsible for a high frequency of hospitalizations, leading to high medical and socioeconomic costs (1). In this sense, systemic hypertension (HT) and diabetes mellitus (DM) are considered multifactorial clinical conditions, frequently associated with population growth and aging, and an increasing prevalence of obesity and sedentary lifestyle, which can cause functional and/or structural alterations of target organs such as the heart, brain, blood vessels, and kidneys (2, 3).

The development of Chronic Kidney Disease (CKD) is frequently associated with HT and DM, which are the main causes of chronic renal failure in patients undergoing dialysis programs (2 - 5).

An important determining factor of renal function changes is the presence of albumin in the urine, initially represented by microalbuminuria or incipient nephropathy, and macroalbuminuria, proteinuria or clinical nephropathy in a more advanced stage (3, 6 - 8).

The clinical evaluation of these patients should take into account the risk factors and the possibility of lesions in the target organs, which can be obtained through laboratory tests such as creatinine clearance, glomerular filtration rate and microalbuminuria to characterize the severity of renal disease (2, 3).

In the case of patients with HT and DM, periodic laboratory tests for monitoring and tracing renal disease are necessary for early detection or to treat the disease in case of its occurrence (2, 3).

In view of the Brazilian guidelines for hypertension and diabetes, renal disease screening should be initiated soon after HT or DM diagnosis, and it should be performed annually based on albuminuria levels and an estimation of the glomerular filtration rate (2, 3).

As the risk of CKD in patients with HT and DM is higher, early diagnosis of this disease needs to be performed as soon as possible, especially by cardiologists and endocrinologists who periodically attend these patients (2, 9). However, although this preventive measure is necessary considering the high prevalence of HT and DM, clinical control also requires regular practice of physical exercise, since it promotes reduced blood pressure, thus improving glycemic control and reducing glycated hemoglobin, characterized an important measure for preventing HT and DM complications (2, 3, 10).

Considering that CKD is recognized as a global public health problem that is underdiagnosed, inadequately treated, and that once developed may lead to increasing medical and hospital care expenses (11 - 14), an evaluation regarding the technical knowledge and academic training of cardiologists and endocrinologists on managing/treating patients with HT and DM can elucidate how these patients are recognized as potential candidates for developing CKD.

In view of the above, the present study aimed to verify whether the guidelines for CKD prevention in patients with Systemic Hypertension (HT) and Diabetes Mellitus (DM) are being developed according to the respective guidelines (2, 3), as determined by cardiologists and endocrinologists of a high complexity hospital with the purpose of evaluating renal function and the practice of physical exercise.

Methods

A cross-sectional, analytical, quantitative study was carried out in a high complexity hospital unit, in the period of July to November 2014.

The present study was approved by the institutional research ethics committee in accordance with resolution 466/2012 of the National Health Council (CNS) protocol 26461313.7.0000.5208.

After a survey carried out in the human resources sector, 31 cardiologists and 10 endocrinologists were identified in this hospital. After clarification and signing informed consent forms, 14 cardiologists and 5 endocrinologists in regular exercise of their duties and duly registered at the referred hospital participated in the study.

Data were collected in a single step from elaboration of a semi-structured questionnaire for each specialization, containing the same questions and specifically designed for this study using questions regarding the knowledge and practice of conducts in accordance with the Brazilian Guidelines for Hypertension (*Diretrizes Brasileiras de Hipertensão*) (2) and the guidelines from the Brazilian Diabetes Society (*Sociedade Brasileira de Diabetes*) (3).

The initial part of the questionnaire was characterized by knowledge regarding academic training, degree (residency in the area) and workplace (public/private), followed by obtaining specific data regarding the preventive action of physicians regarding the request for preventive exams, detection/screening for renal function impairment and referral to the nephrologist, as well as data related to performing physical exercise and referral to professionals who treat patients with physical exercises (physiotherapist and physical trainer).

The present study considered the recognition of renal disease as adequate based on a request of exams for albuminuria and an estimation of glomerular filtration rate, as recommended by the HT and DM guidelines; identification of patients' renal function changes by these professionals; referral follow-up by the nephrologist; and referral of the patient to a physical exercise program by a physiotherapist and/or physical trainer.

Statistica l analysis

An evaluation of the characteristics of the evaluated professionals was presented as percentage frequencies and frequency distributions. Chi-square test for homogeneity was performed in order to compare the behavior of cardiologists and endocrinologists regarding their patient's renal function and physical activity evaluation. Fisher's exact test was applied in cases where the assumptions of the chi-square test were not met. All conclusions were made considering a significance level of 5%. A database was built in a Microsoft Excel spreadsheet which was exported to the SPSS version 18.0 program to analyze the data.

Results

Of the 41 volunteers eligible to participate in the study, only 22 professionals were contacted and 19 of these completed the study, being 14 cardiologists and 5 endocrinologists (Figure 1).

On average, 58.8% of the professionals evaluated presented an age less than or equal to 40 years, and 73.7% were cardiologists. The majority (94.7%) did residency programs in their area of activity, 68.4% had work experience above 10 years or more and worked in public and private institutions (Table 1).

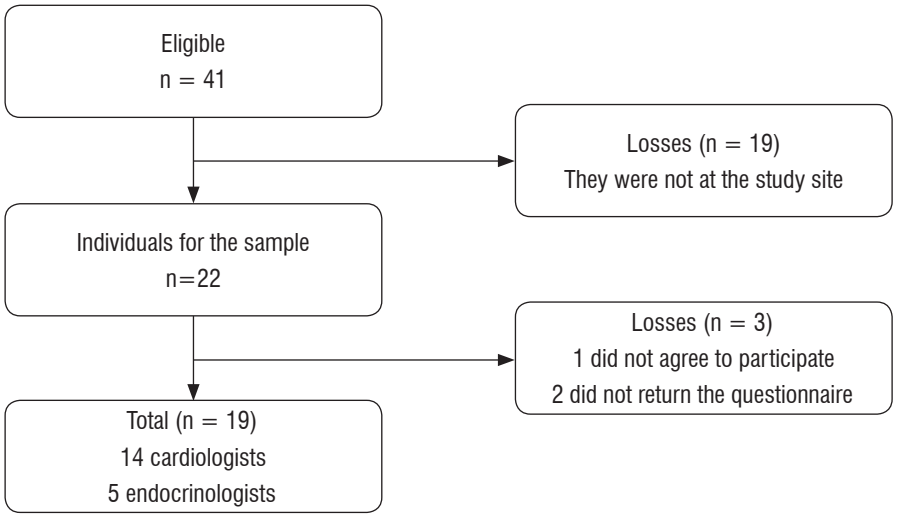

Figure 1 - Flowchart of patients in the study.

Table 1 - Characteristics of cardiologists and endocrinologists regarding their age, academic background and workplace

Evaluated factor	N	%	p-value
Specialization/occupation			
Endocrinologist	5	26.3	0.039
Cardiologist	14	73.7	
Residency			
Yes	18	94.7	< 0.001
No	1	5.3	
Years of Completion after residency			
0 to 5 years	4	21.1	
5 to 10 years	2	10.5	0.004
10 or more	13	68.4	
Workplace			
Public	6	31.6	0.108
Public and private	13	68.4	

Note: Considering p-value < 0.05.

Table 2 presents the results regarding the evaluation of renal function. All cardiologists and endocrinologists reported encountering cases of impaired renal function; 57.1% of the cardiologists and 60% of the endocrinologists reported rarely finding this occurrence. According to the questionnaire responses, both groups reported requesting laboratory tests for their hypertensive and diabetic patients for CKD prevention; however, none of these professionals requested glomerular filtration rate (GFR) nor albuminuria; moreover, the frequency in which laboratory tests were requested, including urea and creatinine, ranged from one to three times a year.

According to the presented answers, 92.9% of the cardiologists and 60.0% of the endocrinologists responded referring these patients to nephrologists as soon as they detected cases of impaired renal function (Table 2).

Table 2 - Characteristics regarding the evaluation of renal function between cardiologists and endocrinologists

Evaluated factor	Medical specialization		p-value
	Cardiologist	Endocrinologist	
Usually require laboratory tests to evaluate the renal function of their diabetic patients			
Yes	14(100.0%)	5(100.0%)	-
Requests GFR and microalbuminuria			(To be continued)

(Conclusion)

Table 2 - Characteristics regarding the evaluation of renal function between cardiologists and endocrinologists

Evaluated factor	Medical specialization		p-value
	Cardiologist	Endocrinologist	
No	14(100.0%)	5(100.0%)	-
How often they usually request exams			
Once a year	5(41.7%)	1(20.0%)	
Twice a year	4(33.3%)	2(40.0%)	0.818
Three times a year	3(25.0%)	2(40.0%)	
Usually encounter cases of impaired renal function in their patients			
Yes	14(100.0%)	5(100.0%)	-
How often they usually find these cases in the outpatient clinic			
Rarely	8(57.1%)	2(40.0%)	0.628
Regularly	6(42.9%)	3(60.0%)	
Type of conduct after encountering kidney disease			
Adequate	13(92.9%)	3(60.0%)	0.155

Note: Fisher's exact test, p value < 0.05.

When questioned about the importance of practicing physical exercise, 100% of professionals in each specialization reported believing that physical exercise can be indicated for their patients, indicating the practice and giving instructions when they do not have a place or someone to refer the patients; moreover, they usually observe changes over time in patients who exercise.

Sixty-eight point six percent (68.6%) of cardiologists and 60% of endocrinologists reported indicating a physical therapist and/or a physical trainer to instruct physical exercises for their patients, both in public and private services (Table 3).

Table 3 - Characteristics of physical exercise evaluation between cardiologists and endocrinologists

Evaluated factor	Medical specialization		p-value
	Cardiologist	Endocrinologist	
Physical exercise can be indicated for their patients			
Yes	14(100.0%)	5(100.0%)	-
Do you usually indicate physical exercise for your patients?			
Yes	14(100.0%)	5(100.0%)	-
Referral for a Physical Therapist/Trainer			
Adequate	11(78.6%)	3(60.0%)	0.570
Service indicated for the practice of physical activity			
Private	3(30.0%)	0(0.0%)	0.505
Public and private	7(70.0%)	5(100.0%)	
Gives guidance on the subject if they have nobody to refer them to			
Yes	14(100.0%)	5(100.0%)	-
There is a change over time in patients who exercise			
Yes	14(100.0%)	5(100.0%)	-

Note: Fisher's exact test, p value < 0.05.

Discussion

According to the results presented, it can be observed that the cardiologists and endocrinologists evaluated in the present study report requesting exams for evaluating renal function of hypertensive and diabetic patients respectively; however, the tests considered adequate for this purpose are not properly requested. One hundred percent of cardiologists and endocrinologists reported indicating physical exercise practice for their patients, however, only 78.6% and 60% of these respectively refer them to appropriate professionals. All physicians recognized an improvement in the physical condition of their patients who follow physical exercise programs.

Although cardiologists and endocrinologists evaluated in our study require periodic laboratory tests for hypertensive and diabetic patients, it is still necessary to include albuminuria and GFR exams in their routines. Other studies carried out in Senegal (13), Spain (14) and the United States (15) show that hypertension and DM are the main diseases that pose a risk of developing kidney damage, and that these diseases require preventive screening through laboratory tests, not only in adults but also in children in order to avoid developing CKD (16, 17).

CKD prevention in at-risk patients should be performed to treat and control modifiable risk factors such as diabetes and hypertension, and their control and treatment must be in accordance with the regulations and guidelines of Brazilian Guidelines for Hypertension and Diabetes which were used as the basis for this study (2, 3).

Our results indicate that cardiologists and endocrinologists request laboratory tests for their patients, however, they do not request microalbuminuria tests or glomerular filtration rate estimates. We do not know whether these professionals are unaware of which tests are considered for diagnosis of renal disease, or whether they do not use them due to operational difficulties in the service. In evaluating renal function at the primary care level, Pena et al. (16) identified that only 8.1% and 4.8% of primary care physicians requested measurement of GFR among diabetics and hypertensives patients attending family health centers respectively, demonstrating the need for more requests of preventive exams by these professionals, especially in services that seek prevention (3, 18).

Albuminuria and GFR are renal function tests that identify and classify renal disease severity and are considered predictors of mortality and of decline in renal function in the general population. Therefore, the recommendation is that the request for these tests should be performed annually for patients who are at risk of developing kidney disease (5, 18, 19).

Regarding the referral of hypertensive and or diabetic patients to a nephrologist, most cardiologists and more than half of the endocrinologists reported making the referral upon detecting altered renal function. In another study, more than half of the physicians (51.2%) referred patients presenting a mild/moderate GFR reduction to the nephrologist, and 25.8% of the physicians did not refer patients with Chronic Kidney Disease to the specialist (16). According to the Brazilian Society of Diabetes, the screening should be annual and be based on albuminuria measurement and glomerular filtration estimation (3).

Appropriate treatment is based on three pillars of support: early diagnosis, immediate referral for nephrological treatment, and implementation of measures to preserve renal function. Of the three pillars, immediate referral of patients for follow-up by the nephrologist or the nephrology team was positively verified in the conduct observed in the physicians of our study (9).

Regarding the practice of regular physical exercise, the present study showed that cardiologists and endocrinologists believe that physical exercise may be indicated for their patients, and that in addition to indicating this practice they also give guidelines if they have no place or person they can refer the patients to. These professionals reported that they tend to observe changes over time in patients who exercise.

The guidelines recommend that in order to maintain good cardiovascular health and quality of life, every adult should perform physical exercise three to five times a week, with 30 minutes of light to moderate physical activity (18). In the case of established kidney disease, Martinez-Castelao et al. reported that exercise should be adapted to the individual's physical capacity (14).

In our study, most cardiologists and endocrinologists reported giving instructions and indicating physical activity for their patients to both public and private services. The importance

of physical exercise practice is recognized by the physicians of our study who are aware that exercise can have a positive impact on many of the health problems, especially hypertension (20 - 23).

The present study did not investigate the possible reasons for not requesting microalbuminuria or GFR exams by these professionals, which was a partial limitation, but at the same time also points out the need for continuity of the study for future clarifications. Another aspect that deserves to be further investigated is patient's acceptance regarding an indication for exercise programs that these professionals referred, since their access is difficult in practice.

This has been one of the first studies to focus on clinical and endocrinological follow-up of hypertensive and diabetic patients regarding the possible development of CKD. Although the guidelines considered in this study highlight the importance of specific laboratory follow-up for CKD screening, we have observed that this reality is not yet fully developed in the high complexity hospital investigated.

The importance of these results for physical therapy is evident. Firstly, it provides physiotherapists the need to instruct hypertensive and diabetic patients about the necessity to perform tests that accompany the evolution of their underlying diseases, as well as enabling these professionals to guide and develop physiotherapeutic treatment programs for clinical control. Secondly, it is evident that despite being guided by cardiologists and endocrinologists, patients may not attribute the real importance of engaging in targeted physical exercise programs. The presence of a physiotherapist may be decisive in raising patients' awareness regarding the importance of participating in exercise programs.

Conclusion

Cardiologists and endocrinologists identified in the present study have found cases of impaired renal function in patients with HT and DM, and reported requesting preventive laboratory tests. However, the requested tests did not meet the requirements for kidney disease diagnosis in its different stages according to the guidelines for each specialization. Regarding the indication for practicing physical exercise, they reported indicating a physiotherapist and/or physical trainer.

We suggest that further studies be developed to ascertain the reasons why screening for CKD in patients with hypertension and diabetes mellitus has not been duly performed according to the specific guidelines of these diseases.

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