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TRACING OF CHRONIC KIDNEY DISEASE IN HYPERTENSIVE AND/OR DIABETIC USERS

RASTREAMENTO DA INSUFICIÊNCIA RENAL CRÔNICA EM USUÁRIOS HIPERTENSOS E/OU DIABÉTICOS

SEGUIMIENTO DE LA INSUFICIENCIA RENAL CRÓNICA EN LOS USUARIOS HIPERTENSOS Y/O DIABÉTICOS

Hallana Cristina Araújo Rodrigues¹, Maria da Penha Carlos de Sá², Rosner Henrique Alves Rodrigues³

ABSTRACT

Objective: tracing chronic renal failure (CRF) in hypertensive and/or diabetic users. **Method:** a descriptive, cross-sectional, quantitative study, conducted with 169 records of patients registered in the Information System of Registration and Monitoring of Hypertensive and Diabetic - HIPERDIA. The study was approved by the Research Ethics Committee CAAE 02392912.1.0000.5208. **Results:** of the 169 users, 5,9% were diabetic, 63,9% hypertensive and 51 (30,1%) hypertensive/ diabetic. Among the hypertensive and/or diabetic users, mostly women with an average age of 55,5 years old. The body mass index was among overweight and obese (54,4%). The average systolic blood pressure was $128,93 \pm 14,66$ mmHg and diastolic blood pressure $81,23 \pm 7,59$ mmHg. Tracing the IRC presented cases in stages I, II and III. **Conclusion:** it is possible to trace the early IRC, within primary care, using the tools of daily practice. **Descriptors:** Chronic Renal Failure; Glomerular Filtration Rate; Hypertension; Diabetes Mellitus; Family Health Program.

RESUMO

Objetivo: rastrear a insuficiência renal crônica (IRC) em usuários hipertensos e/ou diabéticos. **Método:** estudo descritivo, transversal, quantitativo, realizado com 169 registros de pacientes cadastrados no Sistema Informatizado de Cadastramento e Acompanhamento de Hipertensos e Diabéticos - HIPERDIA. O estudo foi aprovado pelo Comitê de Ética em Pesquisa CAAE 02392912.1.0000.5208. **Resultados:** dos 169 usuários, 5,9% eram diabéticos, 63,9% hipertensos e 51 30,1% hipertensos e diabéticos. Dentre os usuários hipertensos e/ou diabéticos, a maioria mulheres com idade média de 55,5 anos. Apresentaram índice de massa corpórea entre sobrepeso e obeso (54,4%). A média da pressão arterial sistólica foi de $128,93 \pm 14,66$ mmHg e a da pressão arterial diastólica foi de $81,23 \pm 7,59$ mmHg. O rastreamento da IRC apresentou casos nos estágios I, II e III. **Conclusão:** é possível rastrear precocemente a IRC no âmbito da atenção básica utilizando-se dos instrumentos da prática diária. **Descritores:** Insuficiência Renal Crônica; Taxa de Filtração Glomerular; Hipertensão; Diabetes Mellitus; Programa de Saúde da Família.

RESUMEN

Objetivo: el seguimiento de la insuficiencia renal crónica (IRC) en usuarios hipertensivos y/o diabéticos. **Método:** este es un estudio descriptivo, transversal, cuantitativo, realizado con 169 registros de pacientes registrados en el Sistema Informatizado de Registro y Supervisión de los Hipertensos y Diabéticos - HIPERDIA. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación CAAE 02392912.1.0000.5208. **Resultados:** de los 169 usuarios, un 5,9% eran diabéticos, el 63,9% hipertensos y 51 (30,1%) hipertensos/diabéticos. Entre los usuarios hipertensos y/o diabéticos, en su mayoría mujeres, la edad promedio era de 55,5 años. El índice de masa corporal entre el sobrepeso y la obesidad (54,4%). El promedio de la presión arterial sistólica fue de $128,93 \pm 14,66$ mmHg y la presión arterial diastólica fue $81,23 \pm 7,59$ mmHg. El seguimiento de la IRC presentado casos en etapas I, II y III. **Conclusión:** se puede rastrear temprano la IRC dentro de la atención primaria, utilizando las herramientas de la práctica diaria. **Descriptor:** Insuficiencia Renal Crónica; La Tasa de Filtración Glomerular; La Hipertensión; Diabetes Mellitus; Programa de Salud Familiar.

¹Nurse, Master's Student, Health Program for Children and Adolescents of the Federal University of Pernambuco/POSCA-UFPE, Specialist in Nephrology, Multidisciplinary Integrated Residency Program in Health/PRMIS, Clinical Hospital, Federal University of Pernambuco/HC-UFPE. Recife (PE), Brazil. Email: hallanacristina@gmail.com; ²Nurse, Head of the Nursing Division, Clinical Hospital, Federal University of Pernambuco/HC-UFPE, Master Teacher, Graduate in Nursing, Federal University of Pernambuco/UFPE. Recife (PE), Brazil. Email: mpenha.sa@gmail.com; ³Graduate Student of Cartographic Engineering, Federal University of Pernambuco/UFPE. Recife (PE), Brazil. Email: rosner.rodrigues@yahoo.com.br

INTRODUCTION

Chronic renal failure (CRF) is characterized by a progressive and irreversible loss of kidney function. This loss is determined from the glomerular filtration (GF), - the kidneys ability to remove substances from the blood - in the period equal or exceeding three months, or before a marker of renal injury structure (e.g.: albuminuria). Based on this definition arose the classification (staging) of CKD in 5 stages: stage 1 ($GF > 90 \text{ mL/min/1,73m}^2$), stage 2 ($GF = 60\text{-}89 \text{ mL/min/1,73m}^2$), stage 3 ($GF = 30\text{-}59 \text{ mL/min/1,73m}^2$), stage 4 ($GF = 15\text{-}29 \text{ mL/min/1,73m}^2$) and stage 5 ($GF < 15 \text{ mL/min/1,73m}^2$).¹

The GF can be determined by creatinine clearance in urine collected in a 24 hour period, or, alternatively, it can be estimated from serum creatinine using the Cockcroft-Gault formula and used in this study Modification of Diet in Renal Disease (MDRD), both formulas have been widely used in several studies in different parts of the world, including Brazil.²⁻⁴

The staging of CRF, in that establishes diagnostic criteria, have made it possible to determine the prevalence of the disease. In studies conducted in the United States and the Netherlands, the prevalence of CRF observed in the general population was 11% and 10,6%, respectively. In Brazil we still do not have this magnitude.^{5,6}

In the course of the disease is observed loss of renal function in an asymptomatic and an insidious manner. Therefore, it is essential to define which patients should be evaluated, identify and treat the main risk groups.⁷ Diabetes and hypertension are the main etiological determinants worldwide, in addition to the elderly, individuals with CKD history associated with therapy renal replacement in the family and those with cardiovascular disease (CVD).⁸

The initiatives for prevention and control of CKD are based on epidemiological study and tracing the population at risk, measures to prevent the onset of CKD in susceptible individuals through lifestyle changes, early diagnosis, measures to slow the progression CKD, early referral to the nephrologist, treatment of complications of CKD and increase in the degree of information to the general public.⁹

In the world stage CKD is considered a public health problem; however, if diagnosed early unwanted outcomes can be prevented or even delayed. However, it is underdiagnosed and inadequately treated, resulting in the loss

of opportunity to implement primary, secondary and tertiary prevention.⁷

The dimension of the problems in the health context, triggered by the CKD contributed to the creation in 2004, by the Ministry of Health, the whole attention policy to the Chronic Kidney Disease carrier, with the basic principle linking patients to the basic health units/Family Health teams.¹⁰ This linking prevention is of great importance, since the risk factors surrounding the disease, require a comprehensive and interdisciplinary approach, skills attributable to primary care professionals. In addition, individuals who make up the group at risk for CKD are initially served by these teams, allowing avoid late referral to nephrology care.^{8,11}

In this context, the aim of this study is to track chronic renal failure (CRF) in hypertensive and/ or diabetic users.

METHOD

A descriptive study of documentary base (secondary data), cross-sectional quantitative which focused on tracking chronic renal failure in hypertensive users and/or diabetic assisted by a Family Health Unit in the city of Recife/PE.

The Family Health Unit in question is located in the Health District IV of Recife, in the western part of the city. Consisting of two Family Health Teams (FHT I and II ESF) provide care in child care, low risk prenatal, immunization, prevention and treatment of leprosy, dental treatment, monitoring of hypertensive patients and/or diabetic by HIPERDIA (System of Registration and Monitoring of Hypertensive and/or Diabetics), in addition to spontaneous demands.

The Registration System, HIPERDIA, allows monitoring of patients with Hypertension and Diabetes Mellitus diagnosed in the Basic Health Network, as well as formulate, regulate and promote actions aimed at reducing risk factors for the development of Cardiovascular Disease, Cerebrovascular and Chronic Kidney Disease. The instrument used in this registration is the Monitoring Sheet of hypertensive and/or diabetic, Ministry of Health, this instrument provides information on age, race, education, smoking, alcohol consumption, physical inactivity, overweight/obesity, family history, laboratory tests, sequels and absenteeism.¹²

In this study, we used the Monitoring Sheet of Hypertensive and/or Diabetic for obtaining clinical follow-up of users (laboratory tests, blood pressure and glucose levels, weight). For the identification of the IRC staging was

estimated using GF laboratory values of serum creatinine. For this, we used the Cockcroft-Gault formula of Equation ($Ccr\text{ ml / yn} = (140\text{-age}) * \text{Weight} * (0.85, \text{ if a woman})/72 * \text{Serum Cr (mg/dL)}$). In which they are presented the GFs calculated from serum creatinine values between 0,5 and 5,0mg/dL and individuals aged between 18 and 80 years old.

From the information in the sheets monitoring of hypertensive and/or diabetic organized a database in Microsoft Office Excel 2010 program and analyzed using Epi Info version 6.04. The inclusion criteria were adopted the registered user information in HIPERDIA more than a year in Basic Health Unit, aged between 18-80 years old and maintained regularly monitoring (consider regularly monitoring nine visits during one year monitoring - 80%). The reference period for data collection was August 2011 to August 2012 (one year of clinical follow-up). Therefore, the study sample consisted of 169 records of registered users in HIPERDIA. Data collection was conducted in the period from August to October 2012.

The research project followed the formal procedures recommended by Resolution 196/96 of the National Health Council (CNS)¹³ and was approved by the Research Ethics

Committee with the CAAE: 02392912.1.0000.5208. The use of hypertensive monitoring reports and/or diabetic was authorized by the Labor Management Board of Recife Health Department, preserving the confidentiality of personally identifiable cases.

RESULTS

It has been evaluated 169 information records of registered users on HIPERDIA and treatment in Family Health Unit, IV district of Recife. For each variable studied alone there was lost, as indicated in the table, due to insufficient data. The sample consisted of 10 diabetics, 108 hypertensive and 51 diabetic and hypertensive patients.

The average age was of 55,5 years old, with female predominance 130 (76,92%) compared to males 39 (23,07%). According to the body mass index (BMI) 25% of the subjects presented overweight and 30% were obese (Table 1).

Table 1. Characteristics of users assisted according to basic pathology. Recife - PE, 2012.

Characteristics	SAH		DM		SAH / DM	
	n	%	n	%	n	%
Gender						
Female	84	49,7%	7	4,1%	39	23,1%
Male	24	14,2%	3	1,8%	12	7,1%
Age (in years)						
≤ 59	54	31,9%	7	4,1%	21	12,4%
≥60	54	31,9%	3	1,8%	30	17,7%
BMI						
<25.0	24	14,2%	4	2,86%	7	4,1%
25.0-29.9	28	16,6%	1	0,59%	13	7,7%
≥ 30.0	33	19,5%	0	0,00%	17	10,1%
Ignored	23	13,6%	5	2,9%	14	8,3%

The average of systolic blood pressure was 128,93 mmHg and the average of diastolic blood pressure was 81,23 mmHg for the group studied. Referring to blood glucose 67 of cases (39,6%) maintained the normal level, while 71 cases (42,0%) had values above 100 mg/dl.

In 41,4% of cases the values of total cholesterol were up to 200 mg/dl, and in 34,9% above 200 mg/dl, HDL 48,5% up to 60

mg/dl and 17,7% above the reference value. The LDL was from 5,3% to 100 mg/dl and 57,3% above this benchmark. Regarding the triglyceride 44,3% had values of up to 150mg/dl, 31,3% were above the reference value (Table 2).

Table 2. Risk factors of users assisted according to basic pathology. Recife - PE, 2012.

Risk Factors	SAH		DM		SAH / DM	
	n	%	n	%	n	%
SBP						
≤120 mmHg	50	29,6%	08	4,7%	27	16,0%
≥120 mmHg	58	34,3%	02	1,2%	24	14,2%
DBP						
≤80 mmHg	77	45,6%	09	5,3%	44	26,0%
≥80 mmHg	31	18,3%	01	0,6%	07	4,1%
Blood glucose						
≤100 ml/dl	58	34,3%	1	0,6%	8	4,7%
≥100 ml/dl	29	17,2%	7	4,1%	35	20,7%
Ignored	21	12,4%	2	1,2%	8	4,7%
Total Cholesterol						
≤200 mg/dl	42	24,8%	3	2,1%	25	14,8%
≥200 mg/dl	46	34,3%	3	7,7%	10	7,1%
Ignored	20	18,5%	4	3,7%	16	9,5%
HDL						
≤60 mg/dl	57	33,7%	3	1,8%	22	13,0%
≥60 mg/dl	22	13,0%	2	1,2%	6	3,5%
Ignored	29	17,1%	5	2,9%	23	13,6%
LDL						
≤100 mg/dl	7	4,1%	1	0,6%	1	0,6%
≥100 mg/dl	67	39,6%	3	1,8%	27	16,0%
Ignored	34	20,1%	6	3,5%	23	13,6%
Triglyceride						
≤150 mg/dl	57	33,7%	3	1,8%	15	8,9%
≥150 mg/dl	30	17,7%	3	1,8%	20	11,8%
Ignored	21	19,4%	4	3,7%	16	14,8%

With regard to serum creatinine predominated for values up to 1,2 mg/dL (113,6%); serum creatinine clearance from the equation of the Cockcroft-Gault formula

demonstrates that 105,9% of the sample maintains the GF above 60ml/min (Table 3). The staging of the CKD to CKD cases presented in stages I, II and III (Figure 1).

Table 3. Glomerular filtration of users assisted according to basic pathology. Recife - PE, 2012.

Glomerular Filtration	SAH		DM		SAH / DM	
	n	%	n	%	n	%
Creatinine						
≤ 1,2 mg/dl	79	46,7%	5	3,0%	35	20,7%
≥1,2 mg/dl	5	3,0%	0	0,0%	2	1,2%
Ignored	24	14,2%	5	3,0%	14	8,3%
<i>Clearance of Creatinine</i>						
≥60 ml/min	13	7,7%	0	0,0%	5	3,0%
≤60 ml/min	71	42,0%	5	3,0%	32	18,9%
Ignored	24	14,2%	5	3,0%	14	8,3%

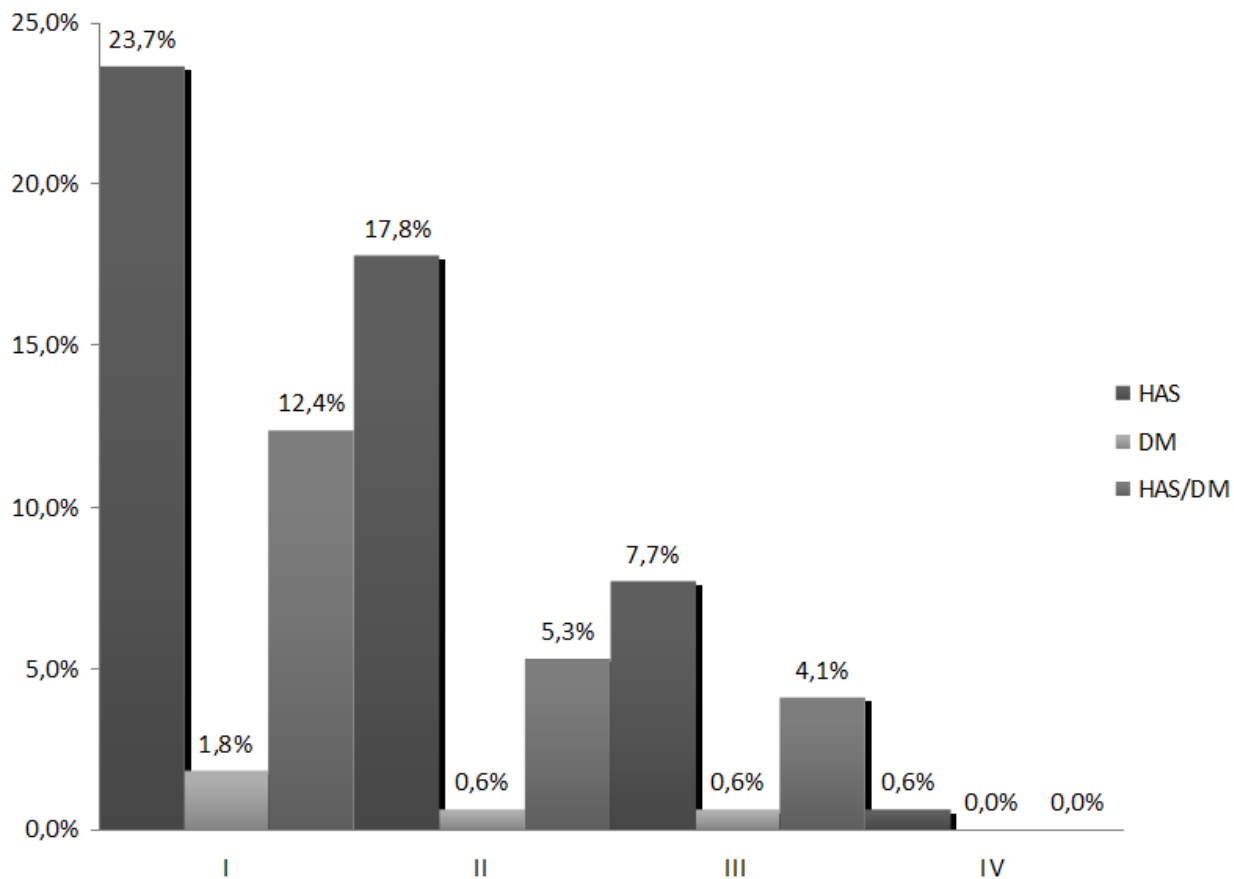


Figure 1. Staging of Chronic Renal failure of users assisted. Recife - PE, 2012.

DISCUSSION

The CKD has high morbidity and mortality. The incidence and prevalence of end-stage CKD (ESRD) have increased steadily every year, in "epidemic proportions" in Brazil and worldwide. The high cost of maintaining patients on renal replacement therapy (RRT) has been of great concern on the part of government agencies.¹⁴

According to the Brazilian Census of Dialysis¹⁵, of the Brazilian Society of Nephrology (2011) the two main underlying diseases of dialysis patients are systemic hypertension (SH) representing 35.1%, followed by diabetes mellitus (DM) 28.4%. Similar fact has been presented in other studies conducted in the country.¹⁶⁻⁸ This demonstrates the importance of keeping a regular monitoring of this at-risk population.

There was an average age around 55, configuring users in the final period of adulthood, a result confirmed by the studies of Ribeiro et al. (2008)¹⁹, Ronqui et al. (2004)¹⁷ and Bregman (2006)¹⁸. Studies show that the glomerular filtration abruptly reduced from 0.08 ml per year from the age of 40, thus, increases the vulnerability of the renal system and the patient loses the ability to maintain renal homeostasis.²⁰⁻²

This result indicates that the chronic degenerative diseases accompanying the increase in life expectancy of the population. This data points to the need for health education strategies and new approaches of

hypertensive and diabetic patients to reduce the impact of morbidity and mortality related to the CKD and its complications.¹⁶

The predominance of females in the study population could be explained because these have more attention to their health. Similar results observed in the study by Araújo et al. (2012)²³, which sought to identify risk factors for the development of IRC in a group of adults and seniors treated at a family healthcare unit of Natal-RN. Therefore, we must develop effective strategies to promote men's adherence to preventive health services.

Admittedly some clinical and laboratory factors are closely related to the evolution of CKD, especially when assessing diabetic and hypertensive patients in stages III to V of CKD.²⁴ Among the factors are prominent blood pressure and glucose levels, BMI and dyslipidemia.²⁵

Strict blood pressure control is of utmost importance to minimize the progression of CKD, and reduce the risk of cardiovascular disease often associated. Hypertension is a major cause of CKD; the main mechanisms of hypertension in the CKD are saline overload and volume. The blood pressure control targets in patients with CRF are lower and, to be achieved, changes are needed in lifestyle, including adaptations of diet and drug therapy.²⁶

It also becomes basic the glycemic control as a preventive measure and control of CKD in non-terminal stages, since the diabetic

nephropathy is the leading cause of ESRD in developed countries. Peres et al. (2006) in his study in the West in Parana found a higher prevalence of DM as the underlying cause of ESRD in the last 20 years.²⁷

The cause of this increase is multifactorial, one explanation for this increase in the incidence of diabetic nephropathy is the increased incidence of type II DM in the general population, due to the obesity epidemic.²⁸ There are recognized some risk factors for the development of diabetic nephropathy; they are: genetic predisposition (known hypertension and cardiovascular events in first-degree relatives), quality of glycemic and lipid control, blood pressure levels and smoking.²⁹

Taken as a group, patients with overweight and obese were majority representing 54,4% of the sample. SAH and DM are closely related to overweight or obesity. Obesity is observed in 90% of patients with type II diabetes and accounts for 65-75% of cases of primary hypertension.³⁰

The mechanisms by which obesity may contribute to the functional loss of CKD may be related to glomerulosclerosis, hypertension, insulin resistance, hyperglycemia.³¹ These data reinforce the idea that obesity is a condition whose prevalence, similar to what occurs in more advanced countries has also increased in developing countries.¹⁶

By analyzing the values of total cholesterol, triglycerides (TG), high density lipoprotein cholesterol (HDL) and low density lipoprotein cholesterol (LDL) observed a change of serum lipid levels in this population; this change is defined with dyslipidemia.³²

So as hypertension, it is also a risk factor for the occurrence of cardiovascular and cerebrovascular diseases, and renal diseases. Lipid levels in the bloodstream are associated with the habit of exercising, drinking alcohol, carbohydrates and fats. In addition, the body mass index and age influence serum fat rates. Regular aerobic physical activity such as running and walking, is assisting measure for the control of dyslipidemia.³³

This study revealed that 36,6% of the samples are among II and IV CKD stage. This percentage shows significant loss of renal function ($GFR < 60 mL/min/1,73m^2$) and with high probability of progression to renal replacement therapy (RRT), if they do not implement the preventive measures of disease progression.²⁴

According to the guidelines of Primary Care Notebook Clinic Prevention of Cardiovascular Diseases, Cerebrovascular and Kidney (2006)²⁵, of the Ministry of Health, to assess the progression of kidney disease should be performed annually in risk patients with stage 0 and 1 CKD every six months in stage 2, a quarterly for all patients in stage 3, and for patients in stages 4 and 5 must necessarily be referred to a nephrologist.

This manual states that 25 renal preventive interventions can be divided into various components, with some competence of primary care. Among the components there have been developing promotion and primary prevention (risk groups for CKD), early identification of renal dysfunction, detection and correction of reversible causes of kidney disease, interventions institution to slow the progression of CKD, identification of patients need assessment with expert for etiologic diagnosis and staging of renal function, and monitoring together with expert for prevention of chronic disease complications and comorbidities in common.

These are skills of primary care control some risk factors are related to the glomerular filtration rate of decline more rapid change such as: ineffective glycemic control, hypertension, greater proteinuria, hypoalbuminemia, hyperlipidemia and smoking. Besides these it is known that males and age confer greater risk, given that it is necessary differentiated monitoring of this segment of the population.

CONCLUSION

The results showed the possibility of early tracing the CKD within primary care, using the tools of daily practice. However, for this it needs to be guaranteed frequency of carrying out the laboratory tests, adequate filling of records and monitoring reports, as well as the development of continuing education programs for professionals involved in the treatment of hypertensive and diabetic patients.

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Rodrigues HCA, Sá MPCs de, Rodrigues RHA .

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Corresponding Address

Hallana Cristina de Araújo Rodrigues
Rua Ébano, Quadra E14A, Nº 9A
Ouro-Preto
CEP 53370-580 – Olinda (PE), Brazil