ARTERIAL HYPERTENSION IN PATIENTS RECEIVING HEMODIALYSIS TREATMENT AND ASSOCIATED FACTORS

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ABSTRACT: This transversal study, with a descriptive-exploratory character, aimed to analyze the presence of arterial hypertension in patients with chronic kidney disease undergoing hemodialysis treatment, and its associated factors. Interviews were held with 140 patients of an institute of nephrology located in the rural area of the state of Minas Gerais, in August – October 2013. The prevalence of arterial hypertension in patients with chronic kidney disease was 78.8%. A relationship was observed between diabetes mellitus, dyslipidemias and ignorance regarding renal failure with arterial hypertension. It was identified that 72.2% of the participants were above their ideal weight, and that of these, 63.3% presented hypertensive crisis in the interdialytic period. It is concluded that arterial hypertension is significantly present in individuals, and that the associated factors are: effective adherence to the dialysis and drug treatment; control of fluid and food intake; and physical activity.
DESCRIPTORS: Nursing; Chronic kidney disease; Hypertension.

HIPERTENSÃO ARTERIAL EM PACIENTES EM TRATAMENTO HEMODIALÍTICO E FATORES ASSOCIADOS

RESUMO: Estudo transversal, de caráter descritivo-exploratório. Objetivou analisar a presença de hipertensão arterial em pacientes portadores de doença renal crônica em tratamento hemodialítico e seus fatores associados. Foram entrevistados 140 pacientes de um instituto de nefrologia localizado no interior do estado de Minas Gerais, no período de agosto a outubro de 2013. A prevalência de hipertensão arterial nos pacientes portadores de doença renal crônica foi de 78,8%. Constatou-se relação entre diabetes mellitus, dislipidemias e desconhecimento acerca da insuficiência renal com a hipertensão arterial. Identificou-se que 72,2% dos participantes excederam ao peso ideal, e destes, 63,3% apresentaram crise hipertensiva no período interdialítico. Conclui-se que a hipertensão arterial está presente significativamente nos indivíduos e os fatores associados são: adesão efetiva ao tratamento dialítico e medicamentoso; controle de ingesta hídrica e alimentar; e atividade física.
DESCRITORES: Enfermagem; Insuficiência renal crônica; Hipertensão.

HIPERTENSIÓN ARTERIAL EN PACIENTES EN TRATAMIENTO HEMODIALÍTICO Y FACTORES ASOCIADOS

RESUMEN: Estudio transversal, de carácter descriptivo exploratorio, cuyo objetivo fue analizar la presencia de hipertensión arterial en pacientes con enfermedad renal crónica en tratamiento hemodialítico y sus factores asociados. Fueron entrevistados 140 pacientes de un instituto de nefrología ubicado en el interior del estado de Minas Gerais, en el periodo de agosto a octubre de 2013. La prevalencia de hipertensión arterial en los pacientes con enfermedad renal crónica fue de 78,8%. Se constató relación entre diabetes mellitus, dislipidemias y desconocimiento acerca de la insuficiencia renal con la hipertensión arterial. Se identificó que 72,2% de los participantes excedieron al peso ideal y, de estes, 63,3% presentaron crisis hipertensiva en el periodo interdialítico. Se concluye que la hipertensión arterial está presente de modo significativo en los individuos y los factores asociados son: adhesión efectiva al tratamiento dialítico y medicamentoso; control de ingesta hídrica y alimentar; y actividad física.
DESCRIPTORES: Enfermería; Insuficiencia renal crónica; Hipertensión.

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INTRODUCTION

According to the dialysis census of 2012, it is estimated that there are more than 97,000 patients undergoing dialysis treatment in Brazil. In 2011, the number was 91,314 patients, which demonstrates a growing number receiving attendance in this speciality[1-2]. Approximately 60% of patients receiving dialysis in Brazil present systemic arterial hypertension (SAH) or diabetes as causes of the continuous and irreversible progression of the loss of kidney function through hypertensive nephrosclerosis and diabetic nephropathy, respectively[3].

The morbidity and mortality in dialysis patients has, as its main causes, the cardiovascular diseases. The cardiovascular mortality of patients undergoing hemodialysis is generally high, reaching 50% of chronic kidney patients, being 10 to 20 times greater in comparison with the remainder of the population[4]. The supposed influence of SAH on these rates has generated greater interest in research, in the different aspects of this characteristic group, as its appearance is intimately related to non-modifiable risk factors exemplified by age, sex, race/color and family history, and to modifiable environmental risk factors such as sedentarism and the absence of a healthy lifestyle, overweight/obesity, and poor diet (excess of sodium)[5-8].

It is worth mentioning that people with chronic kidney disease (CKD) undergoing renal substitution therapy need to adjust to a different diet, as well as to adhere to the drug treatment. The drug therapy involved in treatment with the intention of stabilizing the disease, so as to prevent complications and interferences in these individuals' prognosis is constituted by continuous-use medications and varying schedules[9].

In the literature, one can find studies which assess the limitations (physical, work restrictions, and social losses) involved in the routine of chronic kidney patients[10] and which seek to understand factors related to quality of life (stage of the disease, physical and mental components, hospitalization and period of time over which dialysis has been received) and the comorbidities (arterial hypertension and stress) which influence these patients' health and routine[11-12].

Therefore, the prevalence of arterial hypertension, associated with other factors, has continued to encourage research. Based on the considerations presented, this study aimed to analyze the presence of arterial hypertension in patients with CKD undergoing hemodialysis treatment, and its associated factors.

METHOD

This is transversal research, with a descriptive-exploratory character, undertaken in an institute of nephrology in a hospital in the rural region of Minas Gerais, Brazil, in the period August – October 2013.

This study's target population was the individuals with CKD undergoing renal substitution therapy (hemodialysis) registered in the nephrology institute which was this study's research scenario, in the three treatment shifts. According to the service's routine, the persons with the disease are divided in the morning and afternoon sessions, from Monday to Saturday; and the night time session, on Mondays, Wednesdays and Fridays.

A total of 142 patients were registered in the institute in the data collection period. To compose the sample, inclusion criteria were adopted: individuals with CKD, receiving hemodialysis, registered in the institute, and aged 18 years old or over, completing a total of 140 participants. Emphasis is placed on the exception of two persons, as one declined to participate and the other was receiving inpatient treatment in hospital.

Data collection was undertaken through interviews with a semistructured script, most questions being closed and precoded. The questionnaire was applied directly to the patient in the institute of nephrology itself.

The dependent variable analyzed was the presence of SAH, defined by the Brazilian Society of Hypertension in the VI Brazilian Directives of Arterial Hypertension as a multifactorial clinical condition characterized by high and sustained levels of blood pressure, presenting systolic pressure greater than or equal to 140 mmHg and diastolic pressure greater than or equal to 90 mmHg[13].

The independent variables analyzed were: social characteristics: sex, age, educational level and ethnicity; indicators of health condition: history

of diabetes, dyslipidemias and presence of hyper/hypotensive peaks; indicators related to behavior/living habits: consumption of tobacco and alcohol and undertaking physical activity; indicators of hemodialysis treatment: knowledge of the medication used and the times at which the medication was given, undertaking of the control of the quantity of liquid ingested daily, the period of time over which hemodialysis has been undertaken (years), the frequency of sessions per week (2, 3 or 4 times), the type of vascular access (arteriovenous fistula (AVF), dual-lumen catheter (DLC) and Permcath), length of treatment in years (less than 1, from 1 to 5, from 6 to 10 and 10 years and over), hypertensive crisis during the treatment using the dialysis machine, and during the interdialytic period, dry weight (habitual) and weight gain in the interdialytic period.

For storage of the data, the Microsoft Office software, Excel was used, version 2007; and for analysis of the data, the Stata software, version 9.0, was used. The normality of the distribution of the quantitative variables was evaluated using the Kolmogorov-Smirnov test. Descriptive analysis of the variables was presented through measurements of central tendency and of adjusted variability, as well as distribution of frequencies. The association between the independent variables in the presence of SAH in the bivariate analysis was evaluated using the Pearson Chi-squared test (x=2). The level of significance adopted in all the comparisons was a = 5%.

The study was approved by the Research Ethics Committee in Research with Human Beings, of the Federal University of Viçosa, under Opinion N. 367.004, and the ethical precepts were in line with Resolution 466/12 of the National Health Council, which supported the development of the Terms of Free and Informed Consent (TFIC) which was signed by all the participants prior to participating in the study. Authorization was requested from the Board of Directors of the Institute of Nephrology in order to undertake the study, a favorable opinion being received from this institution's Research Ethics Committee.

RESULTS

Among the 140 patients of the study, 55.3% were male. The mean age was 55.79 years old (sd = ±16.72 years old) with the age range from 40 to 59 years and 60 to 79 years corresponding to 36.15% and 33.08%, respectively.

Table 1 – Prevalence of SAH, according to patients' sociodemographic variables. Minas Gerais-Brazil, 2013

Variables	N	Prevalence (%)	p**
Sex			
Female	48	81,4	0,52
Male	56	76,7	
Age range (years)			
20 – 39	25	83,3	0,63
40 – 59	37	76,6	
60 – 79	33	74,4	
80 years and over	09	90	
Ethnicity			
Caucasian	33	75	0, 73
Mixed	35	79,5	
Black	36	81,8	
Educational level (years)			
Up to 4	67	78,2	0,74
5 to 9	27	81,8	
10 to 12	07	77,8	
More than 12	03	60	

* Number of individuals in the sample / ** Pearson x^2 test

The global prevalence of SAH in patients with CKD was 78.8%, corresponding to 104 patients of the sample studied. In relation to the social variables, it was not possible to observe a significant difference in the prevalence of history of SAH (Table 1).

Table 2 presents variables of living habits and health conditions. One can observe comorbidities in the patients studied, with greater prevalence of diabetes (91.7%) and a total of individuals who present a history of SAH accompanied by a situation of dyslipidemia, as well those who were unaware of this condition of the disease. As a result, it was possible to observe statistically significant associations between the presence of these illnesses and the occurrence of history of SAH in the patients with CKD. There were higher prevalences in the absence of comorbidities, habits of ingesting alcoholic drinks and the habit of smoking (79.6%, 79.7% and 80% respectively) (Table 2).

Among the individuals investigated, those who stated that they did not know the medication which they used corresponded to 87.8%. However, 79.5% state that they knew the time

Table 2 – Prevalence of SAH, by variables of living habits and health conditions, of patients. Minas Gerais-Brazil, 2013

Variables	N	Prevalence (%)	p**
History of diabetes			
No	71	74	0,02
Yes	33	91,7	
History of dyslipidemia			
No	78	73,6	0,01
Yes	15	100	
Does not know	11	100	
Presence of other comorbidities			
None	74	79,6	0, 41
Loss of previous kidney transplant	02	50	
Cardiovascular diseases	07	70	
Others	21	84	
Habit of smoking			
No	88	78,6	0,89
Yes	16	80	
Habit of drinking alcoholic drinks			
No	98	79,7	0,36
Yes	06	66,7	
Practices physical exercise			
Yes	27	69,2	0,08
No	77	82,8	

* Number of individuals in the sample / ** Pearson's x^2 test

for using the medications used. Still in relation to the medication, among the individuals who present hypertensive peaks, 61.5% report having left the drug regimen prescribed, presenting the following rationales: difficulty in adhering to the therapeutic process, the large quantity of drugs, lack of understanding regarding the importance of the therapy and not accepting the adverse events.

In relation to the episodes of hypertensive crisis, this result was statistically significant, as observed in Table 3.

In the study undertaken, for each participant, the ideal weight gain in relation to their dry weight was calculated. The hypertensive peak observed during the hemodialysis session is caused by the overload of liquids and sodium, with retention occurring (edema) and the appearance of SAH. After undertaking ultrafiltration with the dialysis machine there is reduction of retained liquids,

Table 3 - prevalence of SAH, according to variables related to the hemodialysis treatment of patients. Minas Gerais-Brazil, 2013

Variables	N	Prevalence (%)	p**
Knowledge of the drug used			
Yes	68	75,6	0,11
No	36	87,8	
Knowledge of the times at which medication taken			
Yes	101	79,5	0,83
No	03	73	
Control of the quantity of liquid ingested daily			
Yes	75	75,8	0,14
No	29	87,9	
Time dialysis has been undertaken (years)			
Up to 1	32	82,1	0,85
1 to 5	40	80	
6 to 10	21	75	
More than 10	11	73,3	
Number of sessions per week			
Two	04	66,7	0,45
Three	96	79	
Four	04	100	
Type of vascular access			
AVF	97	77,6	0,37
Permcath	03	100	
DLC	04	100	
Hypertensive crisis during the treatment w/ dialysis machine			
No	37	67,3	<0,01
Yes	67	87	
Hypertensive crisis during the interdialytic period			
No	43	68,5	<0,01
Yes	53	97,9	
Does not know	08	72,7	

* Number of individuals in the sample / ** Pearson's x^2 test

leading to the normalization of arterial pressure.

Figure 1 presents the distribution of the individuals' weight gain in the interdialytic period, in which 72.2% exceeded the ideal weight, and, of these, 63.3% presented hypertensive peaks. The calculation of the individuals' weight gain in the interdialytic period was observed, associating weight gain and the appearance of hypertensive peaks. Among the 16.4% of individuals who did not exceed the weight, 43.4% presented hypertensive peaks, while of those individuals who did not record the mean weight gain (11.4%), 62.5% presented hypertensive peaks.

In relation to the living habits of the individuals receiving hemodialysis treatment, 53 participants reported presenting hypertensive peaks in the interdialytic period. Figure 2 presents the association of this hypertensive peak in the 53 participants and the habit of smoking; non-use of the medication necessary for the treatment; absence of control of fluid intake; use of alcoholic drinks, and the practicing of physical activity.

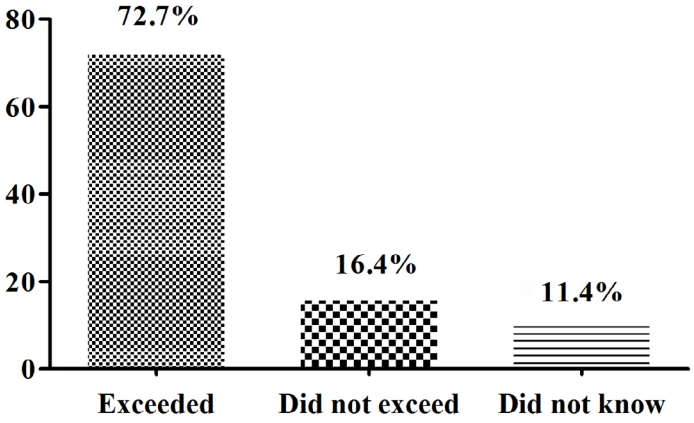

Figure 1 – Distribution of weight gain of the patients with CKD in the interdialytic period. Minas Gerais-Brazil, 2013

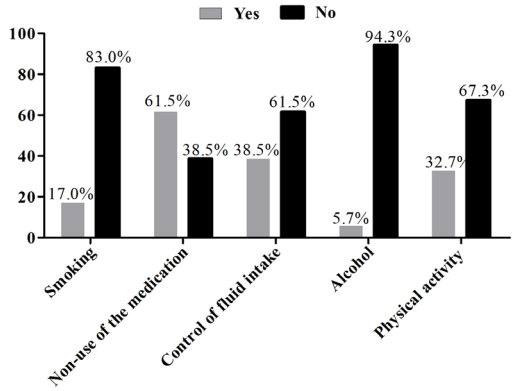

Figure 2 – Living habits of the patients with CKD who presented hypertensive peaks in the interdialytic period. Minas Gerais-Brazil, 2013

DISCUSSION

Patients undergoing hemodialysis treatment present cardiovascular events as common complications, SAH being the main one. As a consequence, there is an acceleration in the process of formation of atherosclerosis and an increase in the risks of cardiovascular accidents, aneurysms, and heart failure[4,13-15].

The control of pressure levels is possibly the measure with the greatest impact for prevention of the progression of kidney damage, besides the appropriate control of other clinical situations such as diabetes, heart failure, and anemia, that is, the main comorbidities which affect chronic kidney patients[13-15].

Studies have also shown that interdialytic weight gain brings complications. In order to maintain an ideal weight, the interdialytic weight gain must not exceed approximately 3% of each individual's dry weight[8]. The results found showed that 72.2% of the participants, on average, exceeded the appropriate interdialytic weight in relation to their dry weight. It stands out that among the individuals who presented hypertensive peaks, 61.5% did not control their fluid intake, and hence were above their ideal weight, which contributes to failure to control arterial pressure and other complications such as congestive heart failure and even death[7-8].

The dry weight is estimated by the physician based on the evaluation of the clinical signs of hydration and of behavior, and is an essential data for the determination of the volume to be removed in the hemodialysis session[8]. Through the dry weight of the residual diuresis and the quantity of the fluid intake, the nursing staff are

able to control the fluid balance and assess the individuals' hydration[7,16].

Some studies indicate that the main causes of the patients not complying with the advice regarding control of weight is the little information and the lack of understanding regarding the true needs to restrict sodium and water, or a lack of clarity regarding what is considered liquid in the diet[17-18].

The nurses, in the light of guidance on self-care and the nursing prescription, have the role of raising the individual's awareness in relation to maintaining weight in preserving her health and well-being, emphasizing the risks of fluid excess and premature death from cardiovascular complications[10,12,15,19-22]. In this advice, one must clarify that some foods such as coffee, tea, soup, ice cream, coconut water, watermelon, pineapple, orange, tomato, and lettuce, among others, are rich in water and must be included in the total volume of liquids ingested, as, for most people, these are not considered as part of the fluid intake, resulting in the increase of volemia and, consequently, in SAH[15,23].

Regarding the drug treatment of the individual with CKD, this is based in the use of hypotensive drugs[9,24]. Persons with CKD must have rigorous drug and diet control, controlled daily, the purpose of which is to stabilize the patient's state of health, in particular when it is an issue of SAH[9]. However, effective adherence entails the patient skillfully adjusting to complying with the clinical recommendations, appropriately ingesting the prescribed drugs, following a healthy lifestyle and frequently undertaking the monitoring procedures[9,22]. Adherence to the drug regimen must go beyond prescription, involving the individual in the self-care through counseling and health education, these actions being undertaken by the nursing professional, as this is constantly monitoring the individual[15,25].

In relation to the other living habits, one factor found in this study was that, among the participants who presented hypertensive peaks, only 17% were smokers and 5% made use of alcoholic drinks, there being no correlation between smoking and the use of alcoholic drinks and the appearance of hypertensive peaks.

According to the VI Brazilian Directives of Arterial Hypertension, the low to moderate consumption of alcohol, and smoking, are not absolutely defined as risk factors for SAH. There is evidence that the ingestion of alcohol for prolonged periods of time can increase arterial pressure. In addition, ceasing smoking is a fundamental and priority measure in prevention; however, there is no evidence that, for the control of arterial pressure, there are benefits[13].

However, smoking and excessive use of alcoholic drinks must be intensely combatted, as these are risk factors for the modifiable cardiovascular diseases, clearly dependent on the individual's behavior[12-13,24-25].

Among the participants who presented hypertensive peaks, 67.3% reported not practicing any physical activity. The regular practicing of physical exercises is recommended for all those with SAH, including those under drug treatment, as it reduces the systolic/diastolic arterial pressure by 6.9/4.9 mmHg. Physical activity also brings benefits for the physiological and metabolic aspects, such as increase in bone mass, in the increase of high density lipoprotein (HDL) cholesterol, in flexibility and in strength, helping to control and prevent diabetes, dyslipidemias and obesity, and assisting in the reduction in the risk of developing cardiovascular diseases[26-27].

There is musculoskeletal harm, which is among the main factors which change the quality of life of the individual with CKD, mainly that requiring long-duration treatment[15]. Clarifying this, the individual with CKD presents mineral metabolism disorders. Among these, there is the rise in the level of parathyroid hormone (PTH), which, when increased, leads to the bone mobilization of calcium, culminating in bone diseases described by nephrologists as renal osteodystrophy, in which physical limitations are generated, leading to difficulty in walking, making physical effort, going up staircases, and running, among others[27-29].

In this context, the literature reports that it is necessary for health professionals to advise the patients regarding other methods of prevention referent to SAH, directly reflecting on the interdialytic hypertensive peak, such as adherence to the drugs, moderate fluid intake, and reduction in the ingestion of sodium, the participation of the nurses in these interventions being fundamental[8,12,19-24].

Consistently, emphasis is placed on the importance of inserting health education in the hospital environment, valuing its relevance

throughout the health organization, such that the individuals may make healthy decisions, and be able to contribute to their quality of life[7,29]. As a result of this, individuals with effective knowledge are more balanced and adhere more efficaciously to the treatment, reducing complications such as cardiovascular events[4,13-15].

qIt becomes essential, therefore, for nurses to undertake health education with the patients receiving hemodialysis treatment, such that these may have knowledge regarding their clinical situation and their treatment in a dynamic way, and thus acquire security and support for their self-care[29-30]. In addition to this, nurses working in the dialysis services must be involved to the maximum, participating not only in the technical treatment but also in relation to the individual with her family and her environment, promoting quality of life.

FINAL CONSIDERATIONS

CKD significantly changes the individual's living conditions, with the need for effective adherence to the dialysis treatment, the drug treatment, the fluid intake, controlled foods and physical activity. However, mainly, inadequate fluid intake, non-adherence to the treatment and sedentarism worsen the clinical status.

However, the conditions indicated are characterized as modifiable, it falling to the nursing professional to interact with and monitor the individuals in changing habits, identifying the behavioral shortcomings, and advising them effectively, ensuring better conditions for living and survival for the patient.

The educational therapies are essential such that the individual may become more secure in relation to her self-care, and co-responsible for her health, and, consequently, be more active in her treatment. It falls to the nursing professional to assist her in her daily therapy, through evaluation and counseling.

It is essential to investigate the prevalence of AH and its associated factors in patients with CKD, as one can calculate the extent of the problem in this group and, in this way, promote the undertaking of efficacious actions which result in greater life expectancy in the population assisted. Regarding the study's limitations, it is emphasized that, although it considers kidney patients receiving hemodialysis treatment, it was undertaken in only one municipality, which implies that generalizations must be made with caution. Further studies must be undertaken for greater generalization of the results found here.

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