ORIGINAL ARTICLE

Correlation between pain and quality of life of patients under hemodialysis

Correlação entre dor e qualidade de vida de pacientes hemodialíticos

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ABSTRACT

BACKGROUND AND OBJECTIVES: To evaluate pain symptoms and their influence on quality of life of chronic renal patients submitted to hemodialysis.

METHODS: Descriptive, exploratory, comparative and cross-sectional study paired by frequency, having as tested group (GI, n=50) chronic renal patients under hemodialysis with hypertension and diabetes mellitus type 2, and as control group (GII, n=50) patients with hypertension or diabetes mellitus type 2, assisted by the Hypertension Ambulatory. Quality of life was evaluated by the Kidney Disease and Quality of Life Short-Form, pain by the Brief Pain Inventory, emotional factors by Beck anxiety and depression scales and neuropathic pain by DN4 questionnaire.

RESULTS: Both groups had predominance of males, mean age of 47.3±16.5 years. With regard to labor, the group under hemodialysis (GI) had 80% of inactive patients. Most impaired quality of life domains were job situation and physical function. There has been prevalence of depression and anxiety, neuropathic pain and more pain complaint in GI, significantly interfering with general activities such as sleep and walking ability. There has been significant correlation ($p<0.05$) between anxiety, physical function and labor situation versus pain.

CONCLUSION: Pain is often ignored, but brings significant consequences to quality of life of patients, contributing for relevant worsening of anxious or depressive symptoms. Thus, it is critical the multidisciplinary management of such patients.

Keywords: Chronic pain, Chronic renal failure, Quality of life.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Avaliar o sintoma da dor e sua influência na qualidade de vida dos pacientes renais crônicos submetidos a tratamento hemodialítico.

MÉTODOS: Estudo descritivo, exploratório, comparativo de corte transversal com pareamento por frequência, tendo como grupo testado (GI, n=50) pacientes renais crônicos em tratamento hemodialítico cuja etiologia era hipertensão arterial e diabetes *mellitus* tipo 2, e como grupo controle (GII, n=50) pacientes com hipertensão arterial ou diabetes *mellitus* tipo 2 atendidos no Ambulatório de Hipertensão. A qualidade de vida foi avaliada pelo instrumento *Kidney Disease and Quality-of-Life Short-Form*, a dor pelo Inventário Breve de Dor, os fatores emocionais pelas escalas Beck de ansiedade e depressão e a incidência de dor neuropática pelo questionário DN4.

RESULTADOS: Na amostra dos dois grupos houve predomínio do gênero masculino, média de idade de 47,3±16,5 anos. Em relação à situação laboral o grupo em tratamento hemodialítico (GI) encontrou uma maioria de 80% de pacientes inativos. Os domínios mais comprometidos da qualidade de vida foram situação de trabalho e função física. Houve prevalência de depressão e ansiedade, maior predomínio de dor neuropática e maior queixa álgica no GI, interferindo significativamente em atividades gerais como sono e habilidade para caminhar. Houve correlação significativa ($p<0,05$) entre índices de ansiedade, função física, situação de trabalho versus dor.

CONCLUSÃO: A dor é um aspecto muitas vezes ignorado, mas que acarreta em consequências significativas na qualidade de vida dos pacientes, contribuindo para um aumento relevante dos sintomas ansiosos ou depressivos. É, portanto, de fundamental importância o atendimento multidisciplinar a estes pacientes.

Descritores: Dor crônica, Insuficiência renal crônica, Qualidade de vida.

INTRODUCTION

Chronic kidney disease (CKD) is a clinical syndrome resulting from the slow, gradual and irreversible loss of kidney function[1]. It is considered a global public health problem[2]. In Brazil, CKD incidence and prevalence is increasing, the prognosis is still bad, and treatment costs are extremely high[1,2]. According to the census of the Brazilian Society of Nephrology in July 2014, the total estimated number of patients on dialysis was 112,004[2].

Technological advances have enabled the evolution in the care of people with CKD, who are now having a greater stability in their physical health from the development and improvement of drugs and the use of sophisticated equipment, such as dialysis[2].

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However, these treatments are still painful and become a barrier in the quality of life (QOL) of these patients[3].

In this context, an important point to assess QOL of the patient undergoing hemodialysis is pain that, despite being a serious problem, it is often underestimated, insufficiently studied and undertreated[3]. Pain accounts for about 40% of all complaints reported by patients during hemodialysis sessions[4]. Patients present a high incidence of bone disease and progressive loss of muscle mass, and other debilitating chronic diseases as diabetes mellitus (DM), neurological diseases, vascular obstructions, among others, which also contribute to the onset of pain in those patients[4,5]. In addition to disabling physical difficulties, pain also leads to several psychological problems, such as sleep disorders, reduced memory/attention, mood disorder (anxiety and depression), impotence and social isolation, having a direct impact on patient's QOL[5].

Despite the improvement in dialysis technology, the incorporation of new techniques and new knowledge, the pain in hemodialysis patients remains common and frequent[6]. Therefore, it is necessary to pay special attention to the pain complaints reported by this group of patients, introducing new procedures for the treatment of this clinical manifestation[6].

Based on the above, the objective of this study was to evaluate, descriptively, the pain symptoms and their influence on the QOL of patients with chronic kidney disease undergoing hemodialysis.

METHODS

It is a descriptive, exploratory, comparative cross-section study, frequency pairing, with the tested group (GI, n=50) of CKD patients under hemodialysis treatment (Hemodialysis Unit of the Hospital de São José do Rio Preto/SP) whose etiology was hypertension (HA) and DM2. As control group (GII, n=50), patients with HA or DM2 cared at the Hypertension Outpatient Clinic of the Hospital de Base de São José do Rio Preto/SP. The inclusion criteria for the GI were to have CKD, be on hemodialysis treatment for at least 3 months, and have HA or DM2 for at least 4 years prior the beginning of hemodialysis. Patients being treated at the Hypertension Outpatient Clinic for at least 6 months with a diagnosis of HA and/or DM2, and having in their patient's record normal creatinine values (<1.4mg/dL for men and <2mg/dL for women) in the last 6 months were included in GII. Patients who refused to answer the questionnaires were excluded. Patients of both groups were paired according to the underlying disease, gender, and age.

The following tools were used: The *Kidney Disease and Quality-of-Life Short-Form Questionnaire* (KDQOL-SF™)[7], which is a specific tool that assesses terminal CKD, applicable to patients who undergo some type of dialysis program. It is a self-applicable tool with 80 items, divided into 19 scales that takes approximately 16 minutes to be answered. It presents a final score from 0 to 100 where 0 corresponds to the worst and 100 the best QOL. The Brief Pain Inventory (BPI)[8] was used to assess pain; it measures the pain and its impact in some areas of the daily life in a preset interval, where zero is the absence of pain and 10 an unbearable pain. Emotional factors like anxiety and depression were assessed by the Beck scales. In this study, we used the anxiety inventory (BAI)[9] and the depression inventory (BDI)[10]. The BAI was proposed to measure the common anxiety symptoms and consists of 21 listed symptoms, containing four alternatives in each, in ascending order of level of anxiety. The scale ranks anxiety in: minimum (from 0 to 9 points); mild (from 10 to 16 points); moderate (from 17 to 29 points); and severe (from 30 to 63 points)[9]. The BDI comprises 21 categories of symptoms and activities, containing four alternatives in each, in ascending order of level of depression. The patient has to choose the answer that best suits his/her last week. The sum of the scores identifies the level of depression. It is proposed the following result for the level of depression: minimum (from 0 to 11 points); mild (from 12 to 19 points); moderate (from 20 to 35 points); and severe (from 36 to 63 points)[10]. The DN4 questionnaire was used to check the incidence of neuropathic pain[11]. There are 7 subjective items and 3 of physical examination. If the end result is at least 4, there are neuropathic characteristics.

The calculation of the sample was carried out from the data regarding the number of patients who undergo hemodialysis at a School Hospital in the interior of the State of São Paulo in the last five years. These numbers varied around 230 people. Based on that data, a sample with 95% confidence, maximum error equal to 5% and considering the estimated proportion equal to 50% (maximum variance), the sample size obtained was equal to 109 individuals. Thus, the sample now studied had 100 respondents to meet the statistical requirement to validate the study.

This study was approved by the Ethics Committee of the institution under opinion number 435.511.

Statistical analysis

The data was input in worksheets using the Microsoft® software and analyzed by descriptive statistics. Continuous variables compared the groups using Student's t-test. Categorical variables were compared with the odds ratio values and were considered significant when within the 95% confidence interval, and the levels of statistical significance (p-value) are presented in the tables and in the text.

RESULTS

Of the 100 studied patients, the male majority was discrete, with age variation between 15 and 84 years and an average of 47.3±16.5 years, the majority was married with an education level average of 7±4.5 years. Demographic and clinical characteristics are shown in table 1.

In table 2, groups I and II scores in BPI, DN4 questionnaire and Beck anxiety and depression scales were compared.

Regarding QOL, all GI patients answered the specific questionnaire for kidney disease (KDQOL-SF). The highest scores were obtained for the dimensions related to "encouragement by the dialysis staff" and "sexual function," and the lowest were for "working situation" and "physical function." The dimensions with the respective averages and standard deviations are shown in table 3. There was no comparison with GII since patients did not have kidney disease.

A linear regression model was adjusted, taking into account the results of the pain, anxiety, depression and QOL questionnaires. Table 4 shows the results with $p<0.05$ for the GI group.

Table 1. Demographic and clinical characteristics of patients in both groups

Variables	GI % (n=50)	GII % (n=50)
Gender		
Female	48 (24)	49 (24.5)
Male	52 (26)	51 (25.5)
Marital status		
Single	24 (12)	10 (5)
Married	64 (32)	75 (37.5)
Divorced	6 (3)	8 (4)
Widow	8 (3)	7 (3.5)
Education		
Incomplete elementary school	30 (15)	24 (12)
Complete elementary school	16 (8)	26 (13)
incomplete secondary school	6 (3)	20 (10)
Complete secondary school	34 (17)	16 (8)
Incomplete higher education	4 (2)	6 (3)
Complete higher education	10 (5)	8 (4)
Employment situation		
Active	20 (10)	62 (31)
Inactive	80 (40)	38 (19)
Etiology	65 (37.5)	70 (35)
High blood pressure	35 (17.5)	30 (15)
Diabetes mellitus type 2		
Alcohol consumption	8 (4)	16 (8)
Smoking	18 (9)	26 (13)

GI = chronic renal patients on hemodialysis treatment; hypertension and diabetes mellitus type 2. GII = control group, patients with hypertension and diabetes mellitus type 2.

Table 2. Levels of depression, anxiety, pain and its impact on daily activities and incidence of neuropathic pain

Parameters evaluated	Groups		
	GI % (n=50)	GII % (n=50)	P value
BDI (number and %)			
Minimum	34 (68)	9 (18)	
Mild	9 (18)	5 (10)	
Moderate	7 (14)	2 (4)	
Intense	0 (0)	0 (0%)	
BAI (number and%)			
Minimum	21(42%)	13 (26)	
Mild	14(28%)	10 (20)	
Moderate	6 (12%)	3 (6)	
Intense	9 (18%)	2 (4)	
BPI (average ± standard deviation)			
Pain intensity	4.70 ± 2.50	1.10 ± 0.80	0.038*
Interference of pain in general activities			
Mood	4.12 ± 3.54	0.00 ± 0.00	0.001*
Ability to walk	4.66 ± 3.69	0.80 ± 055	0.038*
Sleeping	4.66 ± 3.69	1.25 ± 0.90	0.045*
Working	3.72 ± 4.18	0.25 ± 0.00	0.028*
In personal relationship	1.30 ± 2.65	0.00 ± .000	0.048*
Enjoying life	2.50 ± 3.35	0.80 ± 0,50	0.048*
DN4 (number and %)			
Nociceptive pain	45 (90)	9 (18)	
Neuropathic pain	5 (10)	1 (2)	

BDI = Beck's Depression Inventory; BAI = Beck's Anxiety Inventory; BPI = Brief Pain Inventory; DN4 = Questionnaire for the diagnosis of neuropathic pain. *p<0.05 - statistically significant difference (Student t-test). GI = chronic renal patients on hemodialysis treatment; hypertension and diabetes mellitus type 2. GII = control group, patients with hypertension and diabetes mellitus type 2.

Table 3. Average values and standard deviation of the KDQOL-SF™ dimensions of GI patients (n=50)

Dimensions	Mean ± SD	Median
Physical functioning	48.34 ± 18.02	55,00
Physical function	36.54 ± 12.85	0,00
Pain	58.95 ± 23.40	65,00
General health	52.45 ± 15.08	55,00
Emotional wellbeing	63.55 ± 22.35	65,00
Social Function	58.46 ± 35.80	56,25
Energy/fatigue	48.55 ± 23.80	50,00
List of symptoms/problems Effects of the kidney disease	60.50 ± 25.30	65,00
Kidney disease overload	45.80 ± 12.70	52,25
Work situation	28.57 ± 39.53	0,00
Cognitive function	65.52 ± 13.40	75,00
Quality of social interaction	75.80 ± 20.55	80,25
Sexual function	74.65 ± 12.40	82,25
Sleeping	58.40 ± 32.50	60,20
Social support	89.56 ± 18.50	82,50
Patient' satisfaction	73.58 ± 15.80	78,50
General health	59.46 ± 20.55	60,25

Table 4. Anxiety, depression and quality of life indexes versus pain intensity in GI patients (n=50)

Correlation	R	Significance level
Anxiety versus pain	0,41	Significant*
Depression versus pain	0,58	Not significant.
Physical Function versus pain	0,46	Significant*
Work situation versus pain	0,41	Significant*

*p<0.05 = Pearson correlation coefficient.

DISCUSSION

The epidemiologic profile mapped in the current study for the patients on hemodialysis (GI), agrees with the Census of Dialysis of 2013, where the majority of patients was male, with age between 19 to 64 years[2,12]. The age average of 47.3 years equates to the emergence of CKD risk groups and base diseases, such as HA and DM2, that increases in adulthood[13].

There was no significant difference in demographics between GI and GII, except regarding the employment situation, where the GI had the majority of inactive patients (80%), while in GII the majority was active (63%). Studies confirm that the CKD generates difficulties at work due to several factors[14,15]. Helantera et al.[16] noted that less than 30% of patients on dialysis were employed, corroborating the data found in this study. In general, since the QOL of these patients is reduced, especially when undergoing hemodialysis treatment, it is common to see unemployment or early retirement[15], which can also contribute to negative results in the analysis of depression and anxiety in these patients.

In relation to the results found in the BDI, the prevalence of depression in GI was higher in all the levels, when compared with GII. As for the anxiety, the worse scores were also found. Andrade,

Sesso and Diniz[17] showed by BDI, that depression ranged from 0 to 37 points, with a median of 8 points showing that most patients (68%) were classified as a minimum level, 23% mild, 8% moderate and 1% severe being related to work activity and type of donor. Patients with no work activity showed more depression symptoms (p=0.027). These results are very similar to the present study. Valle, Souza and Ribeiro[18] showed with different analysis tools that all hemodialysis patients had some degree of anxiety. In the Stasiak[19] study with hemodialysis patients, depression of any intensity was found in 22.6% of patients in the BDI and anxiety of any intensity was found in 25.7% of patients in the BAI. These results were lower than those found in our study, probably due to a characteristic of the collection site, since the Hospital de Base is a Reference Center for severe cases and patients with multiple comorbidities. Abraham et al.[20] stated that patients on dialysis when physically and mentally adapted to their treatment, that is prescriptions, restrictions, and diets, end up in a state of alert and tension, which triggers anxiety reactions due to the constant exposure to stressing situations, such as dialysis and frequent stay in hospitals. Barros et al.[21] reported that questionnaires that investigate psychological aspects allow to identify the frequency and degree of anxiety, depression, and impact on QOL in patients with kidney disease and can contribute to planning a better multidisciplinary service.

Regarding QOL, all GI patients answered the questionnaire specific to kidney disease (KDQOL-SF™, being the lowest scores for "work situation" and "physical function". These results were consistent with Lopes[22] study. This same study showed that the disease symptoms, associated with the day-to-day factors of patients undergoing hemodialysis, generate a negative impact on these aspects. Working is the basic condition for human emancipation, and it is part of each person's identification. Therefore, it becomes one of the most precious human values. Depending on the disease and the treatment, patients often need to stop working, which influences the QOL. Stop working or reducing working time is a factor that counteracts the lifestyle that the individual had before, thus causing a negative impact on its quality.

When comparing the incidence of chronic pain between GI and GII, we observed the worst scores in those patients undergoing hemodialysis. The results of the DN4 questionnaire showed a higher prevalence of neuropathic pain in GI, as well as more pain complaints by the Brief Pain Inventory. These results promoted pain interference in general activities like sleeping and ability to walk. In the study of Klassen et al.[23], these parameters indicated that untreated or prolonged neuropathic pain in chronic renal patients changes functional performance and generates myalgia and fatigue.

Taking into consideration the results of the pain, anxiety, depression and QOL questionnaires, it was observed a significant correlation of the influence of pain under the following aspects: anxiety, physical function, and work situation. However, few studies in the literature correlate the QOL in general with the pain complaints of patients undergoing hemodialysis, showing once again that pain is often underestimated, insufficiently studied and undertreated[24,25].

CONCLUSION

The data indicate a significant correlation between pain and anxiety, physical function and work situation in chronic renal patients undergoing hemodialysis.

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