PATIENTS RECEIVING HEMODIALYSIS WITH THE NURSING DIAGNOSIS OF FLUID VOLUME EXCESS: SOCIOECONOMIC AND CLINICAL ASPECTS*

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ABSTRACT: This study aimed to describe socioeconomic and clinical aspects of chronic kidney patients receiving hemodialysis, with the nursing diagnosis of Fluid Volume Excess. It is a transversal study, undertaken in a teaching hospital and hemodialysis clinic in the Northeast of Brazil, with a sample of 100 patients. Data collection was undertaken using a questionnaire which covered clinical and social economic data, between December 2012 and April 2013. The majority of patients with a diagnosis were female, of mixed African and European descent, retired, with a companion, claimed to follow a religion, had a mean age of 50.4 years old, had studied for a mean of 6.5 years, and had a mean income of two minimum salaries. Furthermore, they had hypertension, azotemia and hyperkalemia, had had kidney disease for a median of 37 months and had been receiving hemodialysis for a median of 33.5 months. They were receiving drug treatment with sevelamer hydrochloride, folic acid, recombinant human erythropoietin and antihypertensive medications. Identifying socioeconomic and clinical aspects contributed to the nursing team's knowledge of the context in which the chronic kidney patients are inserted.
DESCRIPTORS: Socioeconomic factors; Renal dialysis; Body fluids; Nursing diagnosis.

PACIENTES EM HEMODIÁLISE COM DIAGNÓSTICO DE ENFERMAGEM VOLUME DE LÍQUIDOS EXCESSIVO: ASPECTOS SOCIOECONÔMICOS E CLÍNICOS

RESUMO: Objetivou-se descrever aspectos socioeconômicos e clínicos de pacientes renais crônicos em hemodiálise com o diagnóstico de enfermagem Volume de líquidos excessivo. Estudo transversal, realizado em hospital universitário e clínica de hemodiálise do Nordeste do Brasil, com amostra de 100 pacientes. A coleta de dados em formulário abrangeu os dados clínicos e socioeconômicos, entre dezembro de 2012 a abril de 2013. A maioria dos pacientes com diagnóstico era do sexo feminino, raça parda, aposentado, possuíam companheiro, professavam religião, tinham média de idade de 50,4 anos, 6,5 anos de estudo e dois salários mínimos. Ainda, apresentava hipertensão, azotemia e hipercalemia, com mediana de 37 meses com doença renal e 33,5 meses em hemodiálise. Em terapia medicamentosa com cloridrato de sevelamer, ácido fólico, eritropoietina humana recombinante e anti-hipertensivos. Identificar aspectos socioeconômicos e clínicos contribuiu para o conhecimento da equipe de enfermagem acerca do contexto em que os pacientes renais crônicos estão inseridos.
DESCRITORES: Fatores socioeconômicos; Diálise renal; Líquidos corporais; Diagnóstico de enfermagem.

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RESUMEN: El objetivo del estudio fue describir aspectos socioeconómicos y clínicos de pacientes renales crónicos en hemodiálisis con el diagnóstico de enfermería Volumen de líquidos excesivo. Estudio transversal, realizado en hospital universitario y clínica de hemodiálisis del Nordeste de Brasil, con muestra de 100 pacientes. Los datos fueron obtenidos por formulario que abarcó los datos clínicos y socioeconómicos, entre diciembre de 2012 y abril de 2013. La mayoria de los pacientes con el diagnóstico era del sexo femenino, raza parda, jubilado, tenía compañero, profesaba religión, tenía media de edad de 50,4 años, 6,5 años de estudio y dos salarios mínimos. También, presentaban hipertensión, azotemia y hipercalemia, con mediana de 37 meses con enfermedad renal y 33,5 meses en hemodiálisis. En terapia de medicamentos con clorhidrato de sevelamer, ácido fólico, eritropoyetina humana recombinante y anti-hipertensivos. Identificar aspectos socioeconómicos y clínicos contribuye para el conocimiento del equipo de enfermería acerca del contexto en que los pacientes renales crónicos están injeridos.
DESCRIPTORES: Factores socioeconómicos; Diálisis renal; Líquidos corporales; Diagnóstico de enfermería.

INTRODUCTION

In 2013, in Brazil, 100,397 persons underwent some form of dialysis treatment. Of these, 62.3% were aged between 19 and 64 years old and 58% were male. In analyzing the number of people receiving dialysis treatment between 2000 and 2013, one can perceive significant increase in the number of patients diagnosed with Chronic Kidney Disease (CKD)[1].

In CKD, there is a gradual and irreversible loss of kidney function, resulting, in some patients, in the retention of sodium and water, consequently increasing the risk of developing edema, arterial hypertension, and cardiac insufficiency, with the initiation of renal substitution therapy being, therefore, necessary[2].

The main types of renal substitution therapy are: kidney transplantation, hemodialysis, and peritoneal dialysis. Hemodialysis stands out as the main type of treatment. It consists of filtering the blood through a machine, in which the objective is to extract toxic substances from the blood and remove excess water. The majority of patients undertake it three times a week, the mean duration being three to four hours[2].

In this context, the chronic kidney patient undergoing hemodialysis presents different needs and problems, which may be identified by the nurse through nursing diagnoses (ND). Among the possible ND in this clientele, emphasis is placed on Fluid Volume Excess (FVE), bearing in mind that the retention of water and electrolytes is one of the characteristics of kidney failure. Furthermore, the patient presents other signs and symptoms inserted in this diagnosis, such as anasarca, azotemia, pulmonary congestion, dyspnea, edema, oliguria, orthopnea, and adventitious breath sounds[3].

Studies on the profile of nursing diagnoses in patients with CKD have shown that more than 50% of these patients have FVE[3-5]. Due to the high frequency of this diagnosis in this clientele, it was understood to be important to characterize the socioeconomic and clinical profile of patients undergoing hemodialysis who have this ND, as this would guide nursing actions in similar clients, providing more efficacious and qualified care.

Studies on the socioeconomic profile help the professionals to establish care plans directed to the relations existing between the sociodemographic profile and the patients with kidney disease. It was observed in one study that elderly patients, female patients, those who were professionally inactive, overweight/obese, or with a greater number of clinical conditions were more susceptible to FVE[4].

In the light of the above, nurses should consider the context in which the individuals with CKD are inserted – and not just their physiopathological aspects. Hence, this study's guiding questions appear, namely: What is the socioeconomic profile of the patients receiving hemodialysis who have the nursing diagnosis of FVE? What is the clinical profile of the patients receiving hemodialysis who have the nursing diagnosis of FVE?

As a result, the study's objective is to describe the socioeconomic and clinical aspects of the chronic kidney patients receiving hemodialysis who have the nursing diagnosis of FVE. Thus, based on this study, the professionals involved in caring for patients with CKD and who have the nursing diagnosis of FVE, will be able to understand more regarding the different profiles of patients, and obtain greater support for developing targetted care plans, with a view to providing quality care, taking into account each patient's context and needs.

METHOD

This is a transversal study with a quantitative approach, undertaken in the hemodialysis department of a teaching hospital and in a hemodialysis clinic in the northeast of Brazil. The joint collection in these two institutions provided an adequate number of patients for the study in the time specified.

The population was of 300 individuals, calculated through the mean monthly number of patients in the above-mentioned clinics. The sample was calculated considering a level of confidence of 95% and a level of sensitivity of 85%; half of the length of the confidence intervals was calculated at 10%, and the proportion of individuals supposed to have the diagnosis, at 50%. As a result, a total was obtained of 98 individuals, although it was decided to finalize the study with 100 patients.

As inclusion criteria, the following were

stipulated: to have CKD; to be receiving hemodialysis treatment; to be in the first hour of hemodialysis at the time of the collection; and to be aged 18 years old or over. The exclusion criteria were: to be physically or mentally impaired such that it would not be possible to undertake data collection.

A questionnaire type instrument was used, with questions covering the clinical and socioeconomic data, covering the following variables: systemic arterial hypertension, diabetes mellitus, laboratory examinations, medications prescribed, vital signs, the length of time the person has had kidney disease, dialysis treatment, sex, race, marital status, religion, occupation, age, educational level and family income. Data collection took place between December 2012 and April 2013. The participants who met the inclusion criteria were invited to participate in the research. After consenting, the signing of the terms of free and informed consent took place. Following that, the patients were interviewed and underwent a physical examination.

The data referent to the prevalence of the nursing diagnosis studied and the socioeconomic aspects were analyzed using the IBM SPSS Statistic software, version 19.0 for Windows. For the analysis of the socioeconomic data, descriptive statistics was used, calculating relative and absolute frequencies, the mean, median, the minimum, the maximum and the standard deviation, and applying the Kolmogorov-Smirnov test for verifying the normality of the data ($p < 0.05$).

This study was considered and approved by the Research Ethics Committee, under Opinion N. 148.428 and received the Certificate of Presentation for Ethical Consideration (CAAE) N. 08696212.7.0000.5537.

RESULTS

In the present study's sample, made up of 100 patients receiving hemodialysis, the nursing diagnosis of FVE was present in 82 patients. The results are shown in three tables which will provide the socioeconomic and clinical data and medications used by these patients.

Based on the data shown above, it is observed that of the 82 patients with the nursing diagnosis investigated, the majority were female. The majority of the sample were of mixed black/

Table 1 - Socioeconomic characterization of the patients receiving hemodialysis who had the nursing diagnosis of Fluid Volume Excess. Natal, RN, 2014

Variables	N	%
Sex		
Female	44	53,7
Male	38	46,3
Race		
Mixed	43	52,4
Black	21	25,6
White	17	20,8
Asian	01	1,2
Marital status		
With a partner	46	56,1
Without a partner	36	43,9
Religion		
Roman Catholic	55	67,1
Evangelical	16	19,5
No religion	05	6,1
Spiritualist	04	4,9
Candomblé	01	1,2
Catechist	01	1,2
Occupation		
Retired	45	54,9
Sickness benefits	22	26,8
None	09	11,0
Active	04	4,9
Alimony	02	2,4

	Age***	Years of stufy	Renda familiar***
Mean	50,4	8,1	2,8
SD*	16,2	5,0	2,6
Median	51,5	6,5	2,0
Min.	19,0	0,0	0,0
Max.	86,0	18,0	15,0
P value	0,2	0,0	0,0

* Standard deviation; **Age in years; ***Income in minimum salaries

white/Indian/Asian descent, had a companion, and stated that they had some type of religion, the majority being Roman Catholic. In relation to occupation, more than half of the clientele received some form of benefit and lived in the State capital.

In relation to age, a mean was obtained of 50.4 years old (±16.2), with a minimum of 19 and a maximum of 86 years old. In relation to

the variables of years of study and income, these presented asymmetric variation (p value < 0.05), indicating that half of the sample had studied for up to 6.5 years and had an income of two minimum salaries, corresponding to R$1,356.00 at the time of the study.

Based on the data shown above, it may be observed that of the 82 patients with the ND of Fluid Volume Excess, most had hypertension. In relation to the laboratory examinations, 100% of the patients presented alterations of urea and creatinine, most had normal values for sodium and calcium, and more than half had alterations for potassium and reduction of hemoglobin and hematocrit.

In relation to the variables of months with kidney disease, months receiving hemodialysis treatment, diastolic arterial pressure, respiratory frequency and pulse rate, these presented asymmetric variation: thus, medians were

Table 2 - Clinical data of the patients undergoing hemodialysis who presented the nursing diagnosis of Fluid Volume Excess. Natal, RN, 2014

Variables	N	%
Hypertension		
Yes	66	80,5
No	16	19,5
Diabetes		
Yes	24	29,3
No	58	70,7
Urea		
Normal	-	-
Altered	82	100
Creatinine		
Normal	-	-
Altered	82	100
Sodium		
Normal	48	58,5
Altered	34	41,5
Calcium		
Normal	47	57,3
Altered	35	42,7
Potassium		
Normal	22	26,8
Altered	60	73,2
Hemoglobin		
Normal	22	26,8
Reduced	60	73,2
Hematocrit		
Normal	04	4,9
Reduced	78	95,1

	Mean	Standard deviation	Median	Min.	Max.	p value
Months with kidney disease	67,5	63,4	37,0	1,0	264,0	0,0
Months in hemodialysis treatment	51,9	55,5	33,5	1,0	216,0	0,0
Systolic arterial pressure	137, 1	25,5	140,0	80,0	220,0	0,3
Diastolic arterial pressure	87,0	15,9	85,0	60,0	140,0	0,0
Respiratory frequency	20,3	4,1	20,0	11,0	31,0	0,0
Pulse	78,2	15,1	73,5	54,0	121,0	0,0

obtained of 37 months, 33.5 months, 85.0 millimeters of mercury (mmHg), 20 respiratory movements per minute and 73.5 heartbeats per minute, respectively. The systolic arterial pressure, however, presented a mean of 137.1 mmHg (±25.5), with a maximum of 220.0 and a minimum of 80.0.

Table 3 - Medications used by the patients with the nursing diagnosis of Fluid Volume Excess. Natal, RN, 2014

Variables	N	%
Sevelamer hydrochloride	69	84,1
Folic Acid	64	78,0
Recombinant human erythropoietin	62	75,6
Antihypertensives	62	75,6
Cyanocobalamin	51	62,2
Iron polymaltose	36	43,9
Calcium carbonate	33	40,2
Analgesics and antipyretics	11	13,4
Insulin	9	11,0
Omeprazole	3	3,7
Pantoprazole	3	3,7
Simvastatin	3	3,7
Clonazepam	2	2,4
Antiarrhythmic	1	1,2
Fluoxetine hydrochloride	1	1,2
Calcitriol	1	1,2
Allopurinol	1	1,2
Prednisolone	1	1,2

Based on the data presented in the above table, it was observed that the medications used most by the patients with the ND of Fluid Volume Excess were: sevelamer carbonate, folic acid, recombinant human erythropoietin, antihypertensives, cyanocobalamin, iron polymaltose, calcium carbonate, analgesics, antipyretics and insulin.

DISCUSSION

In relation to the study sample (100 patients), it was observed that 82% had the nursing diagnosis of FVE, characterizing more than half of the individuals. This data is corroborated by studies which also evidence the presence of this nursing diagnosis in patients undergoing hemodialysis[3,5-6].

The high percentage of this diagnosis can be explained physiologically, as the individuals with CKD present a reduction in the glomerular filtration rate, causing a reduction in the renal excretion of water and electrolytes which accumulate and trigger the accumulation of liquid[7].

It was ascertained that of the 82 patients, the majority were female, a fact which differs from the studies found in the literature, in which the data showed that the percentage of patients undergoing dialysis who are male is greater[3,8]. In this regard, the study indicates that the women receiving hemodialysis present lower scores in quality of life and have a greater risk of death in comparison with the men. Moreover, linked with this, women retain the role of providing care in the home and for the children, a context which may be responsible for increasing the physical and mental stress[9]. Therefore, it is supposed that this reduction in quality of life may be associated with the larger contingent of women with FVE.

In relation to race, more than half were classified as being of mixed black/white/Indian/Asian descent, differing from some studies which indicate Caucasians as having a higher incidence[3,10-12]. Another study, on the other hand, considered those of black and mulatto descent as having greater risk for terminal kidney disease[12].

In relation to marital status, more than half of the patients reported having partners, which was evidenced in other studies[11-13]. The presence of the family is fundamental for the renal patient receiving dialysis, as it helps in coping with the disease, as well as in adhering to the treatment[14].

Concerning the presence of religious belief, which was present in most of those interviewed, it also performs an important role, bearing in mind that it contributes to the process of the rehabilitation of the individuals receiving dialysis. For these people, believing in a higher being is configured as support, which helps them to cope with the adversities resulting from the disease and the treatment. Furthermore, it also represents the hope of being cured[14].

In relation to occupation and income, the majority of the participants were retired and the monthly income was of two minimum salaries. The high number of retired people

may be explained due to the benefits acquired through the National Institute of Social Security (INSS), following confirmation of the chronic kidney disease[11], emphasizing that the minority of individuals undertook paid employment, a context resulting from the limitation imposed on the patients undergoing hemodialysis, as this requires time: in addition to this, there are the physical problems resulting from renal insufficiency, such as: nausea, malaise, fatigue and loss of strength, hindering the undertaking of work[15].

The income of two salaries for the patient's family is related to the profile of the institutions studied, as these attend patients who are attended under the Unified Health System (SUS) , this being the main institution responsible for paying for dialysis treatment in Brazil[1]. Thus, individuals with a low economic level undertake treatment through the SUS, as they do not have the favorable conditions for paying for private healthcare plans, corroborating, with other authors, a study of the profile of chronic renal patients, in which individuals with a low economic condition are service users of the SUS[16].

In this regard, the low socioeconomic condition, in its turn, interferes in the quality of the adherence to treatment, mainly in relation to food, as well as to difficulty in accessing the health service, transport and pharmacological and dialysis treatment, favoring survival without dignity[13]. In this regard, it is believed that this profile has favored the presence of FVE in the sample studied here.

Regarding age, the results were similar to the data from the Nephrology Census[1]. In this perspective, research states that individuals undergoing hemodialysis in a higher age range have a lower rate of survival[9,17]. Thus, bearing in mind that in this study a large proportion of the sample were in an advanced age range, and considering the frequent presence of FVE, which can precipitate some health problems in these individuals, it is believed that the rate of survival in the patients investigated tends to reduce, as a result of these two factors.

In relation to educational level, the median number of years of study was 6.5 years. This data is similar to that found in the literature, which reveals patients undergoing hemodialysis treatment who did not complete their basic education, which interferes in the individuals' understanding regarding their illness, education being of fundamental importance for adherence to the treatment. Hence it falls to the nurse to adapt the guidance provided to this clientele so as to promote greater understanding regarding the treatment and the necessary restrictions[11-13].

In relation to the comorbidities presented by the patients studied, it was observed that a large proportion had systemic arterial hypertension (SAH), a result similar to that of other studies in which SAH is associated with functional and/or structural changes in target-organs, such as the kidneys[1,13,18-19]. Studies state that the raised rates of associated diseases such as diabetes mellitus and arterial hypertension contribute to the high prevalence of cardiovascular diseases (CVD) in patients with CKD, as they cause injuries in the renal tissue and in the cardiovascular system[20].

In this regard, although it was identified with a smaller percentage in this study, diabetes becomes established gradually and asymptomatically, progressing to the loss of kidney function and to greater need for dialysis, limiting the quality of life and increasing the risk of death. One of the main complications is diabetic nephropathy, resulting from the long exposure to hyperglycemia, poor control of hypertension, levels of cholesterol, smoking, and also to genetic factors. Its prevention is very important in order to avoid and/or reduce renal injury, therefore it is essential to undertake glomerular control[21-22].

Therefore, taking into consideration the high frequency of SAH and diabetes among persons with CKD, the reduction of the risk of mortality of the individuals with CKD must be an important role for the nurse, who must advise the patient regarding the importance of complying with practices which protect health, such as changes in lifestyle, stopping smoking, reducing consumption of sodium and protein, losing weight, and practicing physical activity for at least 30 minutes, five times per week – besides appropriate pharmacological treatment[23-24].

Regarding the vital signs evaluated at the start of the data collection, it was observed that respiratory frequency was considered normal within the parameters found in the literature, at between 16 and 20 bpm . The pulse was also found to be within normal limits, being from 60 to 100 bpm[25].

Finally, in accordance with the classification stipulated by the literature, the systolic and diastolic arterial pressure was borderline, the systolic being between 130-139 mmHg and the diastolic between 85-89 mmHg. It was measured using the indirect method, with an aneroid sphygmomanometer. According to the classification, arterial hypertension is considered to be present when the systolic pressure is equal to or greater than 140 mmHg and/or the diastolic pressure is greater than or equal to 90 mmHg[24].

Referent to the laboratory examinations, there was alteration in the values for urea and creatinine in 100% of the sample. The kidneys eliminate the products of degradation resulting from the body's metabolism, urea being the main product of the metabolism of protein, and creatinine being the product of the endogenous degradation of the skeletal striated muscles. However, in the patient with CKD, as the glomerular filtration rate (GFR) reduces, the renal excretion of these substances reduces in the same proportion[2], as these accumulate in the blood, which fact explains the alteration in the 82 patients.

Electrolyte alterations were also evaluated, being mainly observed in the serum levels of potassium. Hyperkalemia is commonly found in patients with acute and chronic kidney failure, with a glomerular filtration rate less than 10 to 20% of what is normal. This excess has an effect on the myocardium and, when serious, causes weakness of the skeletal striated muscle and paralysis, related to the blocking of muscle depolarization. Furthermore, manifestations such as nausea, intestinal colic and diarrhea can occur[2].

The reduction of the hemoglobin and the hematocrit in a large proportion of the patients reflects the reduction of the renal function in CKD, causing a situation of anemia. This occurs due to the inefficiency in the production of erythropoietin, a hormone produced mainly by the kidneys, which stimulates the bone marrow to produce erythrocytes. As a consequence, symptoms appear such as fatigue and lack of air[2, 26-27].

Regarding the number of months the patient had kidney disease, and the months of hemodialysis treatment, medians were obtained of 37 and 33.5 months, respectively. Similar data were found in the 2013 Brazilian Society of Nephrology census[1]. It is worth emphasizing that kidney disease has five stages, and dialysis is only indicated when the last stage is reached, in which the glomerular filtration rate is below 15l/min[24]. Therefore, the time the patient has had kidney disease does not always correspond to the times they have been receiving dialysis treatment.

The importance of controlling the blood pressure is emphasized, as a large proportion of chronic kidney patients have systemic arterial hypertension. When not controlled, this tends to cause greater damage to the renal system, contributing to a worsening in the situation; therefore, for greater efficacy in the control, the treatment must be individualized, taking into account the cause of the CKD and the presence of pre-existing CVD[19].

As identified in this study, CKD gives rise to various complications, including hyperphosphatemia, which consists of an increase in the plasma concentration of phosphate. When associated with calcium, this can cause the calcification of the coronary arteries, and consequently ischemic heart disease, acute myocardial infarction, cardiac arrest and sudden death. Hence, for its treatment, it is necessary to use medications such as sevelamer hydrochloride, which is found in first place on the list of drugs used by this population[28].

The medications used for treating anemia, very common in chronic kidney patients due to the shortage of erythropoietin produced by the kidneys, also has many users, as do folic acid and recombinant human erythropoietin. This last is one of the drugs causing greatest expense in Brazil[28].

In addition to these, the antihypertensive drugs were also much used, due to the fact that a large proportion of the sample had SAH. It is emphasized that patients with CKD associated with hypertension have a greater risk of developing cardiovascular disease; as a result of this, blood pressure must be controlled rigorously such that this risk may be reduced[20,29].

The low socioeconomic condition of the patients in this study, associated with the difficulties with diet and pharmacological treatment, cause the Unified Health System to be responsible for meeting the costs of the treatment of a large proportion of the population, thus making the cost to the government high. However, if this were not undertaken, the service users would be unlikely to have the conditions to meet the costs, due to the chronic character of the disease, and

the constant use of these medications - and of the treatment in general - being necessary.

In addition to this, it is understood that the Brazilian financial system, and the population's health, require better investment in preventive measures in primary health care, for the promotion of the health of those individuals with risk factors for developing CKD.

CONCLUSION

This study evaluated 100 patients with a diagnosis of chronic kidney disease and who were receiving hemodialysis; the majority of these had the nursing diagnosis of FVE. Of these, the majority were female, of mixed black, white, Indian and Asian descent, with a mean age of 51 years old, with partners, who followed a religion, who were retired, and who had an income of two minimum salaries and a low educational level.

Furthermore, in analyzing the socioeconomic variables and the prevalence of the nursing diagnosis of FVE in this specific clientele, it was ascertained that sex, marital status, religion, occupation, income, educational level and age are variables similar to those found in other studies on the profile of this clientele – and according to the literature are related to the presence of this diagnosis.

In relation to the clinical data, the majority had hypertension and diabetes as comorbidities. The laboratory examinations for urea, creatinine, potassium, hemoglobin and hematocrits presented alterations. Regarding the time the patient has had kidney disease, it was observed that this was slightly greater than the time in hemodialysis treatment. The medications used vary, but there is a prevalence of those which aim to treat the complications caused by the chronic kidney disease and hemodialysis; data which corroborate those of similar studies.

It is concluded, therefore, that knowledge of the socioeconomic and clinical aspects by the nursing team is relevant, as it contributes to increasing the range of knowledge regarding the context in which the chronic kidney patients are inserted, which may not be disassociated from the clinical care, continuous studies on this issue being, therefore, essential, mainly due to this being a chronic disease. The clinical and socioeconomic profile, moreover, favors efficacious and thorough assistance, and thus a nursing care which is qualified and scientifically substantiated.

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