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Prevalence of hepatitis C in patients with renal disease undergoing hemodialysis treatment

Prevalência de hepatite C em pacientes com doença renal submetidos a tratamento hemodialítico

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ABSTRACT

Introduction and objective: This study aimed at determining the prevalence of hepatitis C among 649 patients diagnosed with chronic or acute kidney disease – patients were undergoing hemodialysis treatment at a large hemodialysis center in Porto Alegre-RS, from January through December, 2012 –, as well as relating our data to that presented in the national census, reporting cases of coinfection by hepatitis C and human immunodeficiency virus (HIV), and defining the demographic profile of these patients. **Method:** An observational cross-sectional study was conducted and data was obtained from information in patients' electronic medical records. **Result and conclusion:** The prevalence of hepatitis C in this study was 10.17% of the sampled population. However, further analysis of other liver centers would be required to estimate an accurate prevalence rate of infection caused by the hepatitis C virus in patients undergoing hemodialysis in Porto Alegre.

Key words: acute renal failure; chronic renal failure; hemodialysis; hepatitis C.

INTRODUCTION

Renal disease is defined by damaged or decreased kidney function. Renal damage can result from any disease potentially able to reduce the functional capacity of the kidneys. It is a multifactorial disease that represents a serious public health problem due to the increasing percentage of patients who become chronically ill, and to the numerous comorbidities that often accompany it. There are several treatment forms, including hemodialysis. The disease can be controlled for some time, but it is progressive, incurable and has high morbidity and mortality rates[1, 12].

Hepatitis C is a liver disease, caused by hepatitis C virus (HCV), a ribonucleic acid (RNA) virus of the *Flaviviridae* family, whose replication process takes place in the hepatocyte cytoplasm. The clinical manifestations of hepatitis C are classified as acute and chronic. The acute infection is usually asymptomatic, but has a high chronicity rate that may reach 80% of the cases[15].

Renal patients that undergo hemodialysis are particularly prone to contamination by HCV due to the several risk factors they are exposed to. Among these factors, we may draw attention to treatment duration, blood transfusions and the virus prevalence in the hemodialysis unit[12, 13].

According to *Boletim Epidemiológico de Hepatites Virais de 2012*, from 1999 to 2011, in the South region, 18,307 confirmed cases of hepatitis C were reported to the Notifiable Diseases Information System (SINAN). This represents 22.3% of the notified cases in Brazil. Most of them were in the state of Rio Grande do Sul (58.2%), followed by Santa Catarina (25.6%) and Paraná (16.2%)[3].

Concerning renal disease, the estimated number of patients undergoing dialysis in Brazil in 2011 was 91,314. Prevalence estimates for 2011 were 475 dialysis patients per million of the population. Among them, 90.6% were on hemodialysis, and 31.5% were 65 years or older. For 2011, the estimated number of patients beginning dialysis was 28,680, and the annual mortality rate was 19.9%[17].

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OBJECTIVE

Based on the relevance of the subject, this work aimed at determining the prevalence of hepatitis C in patients diagnosed with acute or chronic renal disease. All of them underwent hemodialysis at a hemodialysis unit in a large hospital in Porto Alegre-RS, from January to December, 2012. This paper also aimed at relating the gathered data to the national census mass of data, reporting cases of patients coinfected with hepatitis C and the human immunodeficiency virus (HIV), and finally, defining the demographic profile of the patients.

METHOD

A cross-sectioned observational study, with a descriptive analytical approach, was carried out for the determination of hepatitis C prevalence in 649 patients diagnosed with acute or chronic renal disease undergoing hemodialysis from January to December 2012. The used data base obtained information from the electronic records of patients.

The survey was conducted at a hemodialysis center of a large hospital in Porto Alegre-RS. That unit serves exclusively their inpatients from the Unified Health System (SUS) who began the hemodialysis treatment due to diagnoses of renal failure. It also serves inpatients with other diseases who present with renal failure, coming from other hemodialysis clinics of the metropolitan region or the inner state. The center also provides treatment for a group of patients with chronic renal failure who are regularly served at a hemodialysis program in the institution.

The sample was composed of 649 patients with acute or chronic renal failure, undergoing hemodialysis from January to December 2012 in the surveyed institution.

This work was submitted to and approved by the Ethics Committee of Universidade Feevale, according to report nº 245.621. It was also assessed by the Ethics Committee of Grupo Hospitalar Conceição, being approved according to report no. 308.906.

In order to access the data bank of the surveyed institution, a data use agreement was signed.

RESULTS

The results presented in **Table 1** refer to a sample of 649 investigated patients receiving hemodialysis from January to December 2012.

TABLE 1 – Absolute and relative distribution by sex, age group, city, color, mean and SD of age, HCV infection, HIV infection and HCV/HIV coinfection for the group of 649 patients[4]

Variables	*n* (%)
Sex	
Female	275 (42.37)
Male	374 (57.63)
Age (years)	
Mean ± SD	60.54 ± 15.07
Age group (years)	
0-19	8 (1.23)
20-29	10 (1.54)
30-39	43 (6.63)
40-49	81 (12.48)
50-59	134 (20.65)
60-69	181 (27.89)
70-79	142 (21.88)
80 or over	50 (7.7)
City	
Porto Alegre	361 (55.62)
Metropolitan region	227 (34.98)
Others	61 (9.4)
Ethnicity/race	
Afro-descendant	121 (18.64)
Caucasian	527 (79.66)
Others	11 (1.69)
Anti-HCV antibodies	
Reactive	66 (10.17)
Non-reactive	583 (89.83)
Anti-HIV antibodies	
Reactive	52 (8.01)
Non-reactive	597 (91.99)
HCV + HIV coinfection	
HCV+HIV	12 (1.85)

SD: standard deviation; HCV: hepatitis C virus; HIV: human immunodeficiency virus.

The results from **Table 2** refer to the 66 patients diagnosed as being anti-HCV positive.

Finally, the results from **Table 3** refer to the 12 patients coinfected with HCV and HIV.

The Ministry of Health, at *Boletim Epidemiológico de Hepatites Virais de 2012*, reveals an index of 1.38% of prevalence of hepatitis C for the general population. According to the same study, 82,041 cases of hepatitis C were confirmed in Brazil from 1999 to 2011, with 22.3% only in the South region. Among these 22.3% national cases, 58.2% occurred in Rio Grande do Sul (RS). Among the capitals of the South region, in 2010, the highest case detection rate per 100,000 inhabitants was observed in Porto Alegre-RS: 40.4%[3].

TABLE 2 – Absolute and relative distribution by sex, age group, city and ethnicity/race and mean age and SD of age for the group of 66 patients with hepatitis C[4]

Variables	*n* (%)
Sex	
Female	23 (34.85)
Male	43 (65.15)
Age (years)	
Mean ± SD	57.83 ± 10.91
Age group (years)	
30-39	2 (3.03)
40-49	14 (21.21)
50-59	21 (31.82)
60-69	19 (28.79)
70-79	9 (13.64)
80 or over	1 (1.51)
City	
Porto Alegre	43 (65.16)
Metropolitan region	22 (33.33)
Others	1 (1.51)
Ethnicity/race	
Afro-descendant	27 (40.91)
Caucasian	38 (57.58)
Others	1 (1.51)

SD: standard deviation.

TABLE 3 – Absolute and relative distribution by sex, age group, city and ethnicity/race, and mean age and SD of age for the group of 12 patients with HIV/HCV coinfection[4]

Variables	*n* (%)
Sex	
Female	3 (25)
Male	9 (75)
Age (years)	
Mean ± SD	50.33 ± 6.4
Age group (years)	
40-49	6 (50)
50-59	5 (41.67)
60-69	1 (8.33)
City	
Porto Alegre	9 (75)
Metropolitan region	3 (25)
Ethnicity/race	
Afro-descendant	4 (33.33)
Caucasian	8 (66.67)

SD: standard deviation; HIV: human immunodeficiency virus; HCV: hepatitis C virus.

According to the Brazilian Society of Nephrology (SBN), the prevalence rates of hepatitis C in dialysis centers in the whole Brazil was 19.9% in 2000, and 9.1% in 2007, showing a 50% reduction in less than 10 years[18].

DISCUSSION

The prevalence of hepatitis C observed in the present study (10.17%) may be considered low when compared to the survey by Gomes *et al*. (2006), which reported 29.1% of HCV infection in dialysis patients in Porto Alegre-RS. It is very similar to the study by Leão *et al*. (2007), in which 10.7% were described in Juiz de Fora-MG[9, 13]. However, when compared to data for the general population (1.38%), this seroprevalence of hepatitis C found in patients with renal failure undergoing hemodialysis is considered high[14, 15].

An important cause of HCV infection in hemodialysis is the practice of transfusion of blood and/or blood components. The study by Yonemura *et al*. verified that from 52 patients who had undergone transfusion, 21 (40.4%) were HCV-antibody positive, while among the 182 patients with no history of transfusion, just 20 (11%) had this antibody. These data may be compared to the study by Hinrichsen *et al*., which also verified increased prevalence of anti-HCV antibody in patients undergoing multiple transfusions[10, 20]. Another factor possibly related to the increase of this prevalence is the duration of dialysis treatment, as observed in other works[6, 16, 19].

This demonstrates the importance of public health strategies, as anti-HCV screening by the nucleic acid test (NAT) in blood donors, and recommendations for prevention and control of hepatitis C at dialysis units, as well as guidance on the reuse of dialyzers, now converted to single use according to a resolution of the National Agency of Sanitary Surveillance (ANVISA), RDC nº. 11, of March 11, 2014[2, 5, 7, 8, 11, 14].

In summary, the obtained results showed a decreased prevalence of hepatitis C when in comparison to studies from the latest years, yet this prevalence is still very high if contrasted with the 1.38% of the general population[3].

Thus, rigorous observance of universal precaution guidelines is necessary to reduce transmission of HCV infection in hemodialysis units. Among the processes are the correct and rigorous disinfection of machines and equipment, precautions for the reuse of dialyzers, and an effective biosecurity control by the health staff. It is very important to keep rigorous screening control on the use of blood components, for instance, the employment of techniques such as NAT, aiming at improving sensitivity in the identification

of HCV and HIV infections. We also highlight the necessity of early diagnosis in primary attention, and of health policies designed to track and monitor cases of hepatitis C in the general population. Besides, a prospective follow-up of hemodialysis patients is also essential so as to identify the actual risk factors for contamination by this disease.

RESUMO

Introdução e objetivo: *Este trabalho teve como objetivo determinar a prevalência de hepatite C em 649 pacientes diagnosticados com doença renal aguda ou crônica – eles se submeteram a tratamento hemodialítico em uma unidade de hemodiálise de um hospital de grande porte de Porto Alegre-RS, de janeiro a dezembro de 2012 –, bem como relacionar os dados encontrados com os apresentados no censo nacional, relatar casos de coinfecção de hepatite C e vírus da imunodeficiência humana (HIV) e, finalmente, conhecer o perfil demográfico dos pacientes.* ***Método:*** *Realizou-se um estudo observacional do tipo transversal cujos dados foram obtidos por meio de informações dos prontuários eletrônicos dos pacientes.* ***Resultado e conclusão:*** *A prevalência de hepatite C encontrada no presente estudo foi de 10,17% da população amostrada. Entretanto, seriam necessárias mais análises em outros centros a fim de estimar a real prevalência para infecção pelo vírus da hepatite C em pacientes submetidos a hemodiálise em Porto Alegre.*

Unitermos: *doença renal aguda; doença renal crônica; hemodiálise; hepatite C.*

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