

Country Data

Prevalence of HCV Infections Among Hemodialysis Patients in Al Gharbiyah Governorate, Egypt

Samy A. Khodir¹, Mervt Alghateb¹, Kamal M Okasha*¹, and Safenaz El-Saed Shalaby²

(1) Internal Medicine and (2) Public Health Departments of Tanta University, Tanta, Egypt.

Abstract

Introduction: Hepatitis C virus (HCV) is a significant problem for patients undergoing hemodialysis (HD) treatment. This medical problem has never been studied in Al Gharbiyah Governorate; this study was conducted aiming to estimate the prevalence of anti-HCV positive patients and the incidence of seroconversion in its different HD units.

Methods: All 2351 patients maintained on HD in the eight towns of Al Gharbiyah Governorate were interviewed and their anti-HCV status was tested by a third-generation enzyme immunoassay. Patients who tested negative for anti-HCV at the start of the study were re-assessed monthly for HCV seroconversion and at the end of the study all patients were screened for HCV antibodies.

Results: At the start of our study in March 2011, we found that 824 out of 2351 patients (35%) were anti-HCV reactive. At the end of study in November 2011, we found that HCV seroconversion occurred in 168 out of 1527 patients (11%) who were HCV free at the start of the study. By the end of the study, a total of 42.2% were found to be anti-HCV reactive.

Conclusion: The study demonstrated high prevalence of anti-HCV in HD units in Al Gharbiyah Governorate. Similar studies must be conducted in all Egyptian governorates' HD units to evaluate this major health problem all over Egypt. We also encourage strict application of preventive strategies for HCV infection in all health institutes, especially HD units.

Keywords: Egypt; HCV; Hemodialysis; Seroconversion

The authors declared no conflict of interest

Please see editorial notes at the end of this article

Introduction

Chronic kidney disease (CKD) has become a major public health problem worldwide over the past decades. This is probably due to the increased prevalence of hypertension, diabetes mellitus, and other risk factors for CKD in most countries [1]. Hepatitis C virus (HCV) infection is the most common chronic blood-borne infection. More than 170 million people worldwide are chronically infected with the virus; HCV is responsible for over one million patients' deaths from cirrhosis and liver cancer every year [2]. The prevalence of HCV infection in maintenance hemodialysis (HD) patients substantially exceeds that in the general population. HD patients have an increased risk of exposure to HCV infection. Several risk factors are suggested to be related to HCV dissemination in HD centers. Repeated blood transfusions, shared dialysis machines, surgery, nosocomial route and multi-dose drug injections are the major suggested routes [3]. However, studies have shown that de novo infections in single HD units may still occur in the absence of other parenteral risk factors [4, 5]. Partial immunosuppression found in HD patients, resulting in a poor antibody response, may play a role in increasing their susceptibility to the infection [4].

The natural course of HCV in HD patients is not well understood. It seems to differ from that in other HCV infected patients [6]. In HD patients, HCV infection has been associated with higher morbidity and mortality rates, and the management of these infections among

*Corresponding author: Department of Medicine Tanta University, Egypt; E mail: okasha70@yahoo.com

CKD patients with specific antiviral agents is associated with high rates of adverse effect [7-9].

The prevalence of HCV infection among HD patients varies from one country to the other and from one center or unit to the other. The reported prevalence of HCV infection among dialysis patients in developed countries ranges from 3.6 to 20%; it is much higher in developing countries [10]. Although anti-HCV positivity by EIA does not discriminate between patients with HCV viremia and those who had cleared the virus, it is very sensitive and may occasionally identify HD patients with very low viremia not detected by PCR. Since our goal was to assess the prevalence of infection rather than viremia, we considered EIA a suitable screening method [4].

Egypt has the largest epidemic for hepatitis C virus worldwide [11]. It is important to know the prevalence of HCV infection in each HD unit. This common medical problem has never been systematically studied in Al Gharbiyah Governorate. The aim of this study was to estimate the prevalence and the rate of seroconversion to anti-HCV positivity for patients in all HD units in Al Gharbiyah Governorate area of Egypt.

Methods

All HD units in the eight towns of Al Gharbiyah Governorate including private and public units were included in this study. During the period from April 2011 to November 2011, we collected data from 2351 patients, including their reported HCV antibody status at the start of HD. Serologic tests for detection of anti-HCV were performed monthly throughout the study using third generation micro-particle enzyme immunoassays (MEIA) (AxSYM® HCV, version 3.0, Abbott, Wiesbaden, Germany). All patients confirmed to carry anti-HCV by repeated tests on new blood samples were considered positive. All anti-HCV positive patients were referred to hepatology service. Permission to conduct the study was obtained from the technical directors of each unit involved. This protocol was approved by the institutional human research ethical committee (IHREC) of the faculty of medicine, Tanta University. An informed consent was obtained from all patients before they participated in the study. Statistical analyses were conducted using SPSS version 13.

Results

This study involved 2351 patients treated with HD and screened for anti-HCV antibodies. The mean age of the patients was 52±11 years (age range 15-75 years). 1406 were male (61%). At entry of the study in March 2011, we found that 824 out of 2351 (35%) were anti-HCV

reactive. At the end of our study in November 2011, we found that HCV seroconversion occurred in 168 out of 1527 patients who were seronegative at the start of the study (11%). At the end of the study, a total of 42.2% were found to be anti-HCV reactive.

Discussion

The reported prevalence of HCV infection among dialysis patients in developed countries ranges from 3.6 to 20% [10]. Prevalence rates are somewhat higher in other parts of the world, particularly in Egypt and Saudi Arabia [12, 13]. The purpose of our work was to provide accurate prevalence and discuss HCV infection in HD units in Al Gharbiyah Governorate.

We found that the overall prevalence of HCV-Ab was 35% in all HD patients in Al Gharbiyah Governorate in March 2011. This high prevalence may be due to repeated blood transfusions, shared dialysis machines, surgery, nosocomial route, and multi-dose drug vials. This agrees with previous reported studies, which show significant increase in HCV antibody positivity in patients subjected to multiple blood transfusions and having prolonged duration of HD [14, 15]. Our findings also show a high HCV seroconversion rate (11%) among patients who were HCV-free at the start of the study. Seroconversion may be associated with previous blood transfusion, central venous catheter use, switching between dialysis places, improper implementation of isolation procedures and infection control measures.

The Center for Disease Control does not currently recommend dedicated machines, patient isolation or a ban on reprocessing of dialyzers for HCV positive patients [15]. Hemodialysis units should focus on implementation of, and adherence to, strict infection-control procedures designed to prevent transmission of blood-borne pathogens, including HCV and other infectious diseases.

Decreasing the infection risk with careful screening, prophylactic measures, and vaccination when it becomes available should improve patient morbidity and reduce associated costs.

Conclusion

HCV is prevalent in HD patients in this study with a high rate of positive seroconversion. We encourage similar studies to be conducted in all Egyptian governorates to evaluate this major health problem all over Egypt. We also suggest that regular audits of infection-control procedures be included in performance reviews of HD units.

References

1. Perico N, Cattaneo D, Bikbov B, Remuzzi G. Hepatitis C infection and chronic renal diseases. *Clin J Am Soc Nephrol.* 2009;4(1):207-20
2. Hahn JA. Sex, drugs, and hepatitis C Virus. *J Infect Dis.* 2007 Jun 1;195(11):15569.
3. Gretch D, de la Rosa C, Carithers RL Jr, Willson RA, Williams B, Corey L. Assessment of hepatitis C viremia using amplification technologies: correlations and clinical implications. *Ann Intern.* 1995 Sep1;123(5):321-9.
4. Seelig R, Renz M, Bottner C, Seelig HP. Hepatitis C virus infections in dialysis units: prevalence of RNA and antibodies to HCV. *Ann* 1994 Feb; 26(1):45-52.5.
5. Santos MA, Souto FJ. Infection by the hepatitis C virus in chronic renal failure patients undergoing hemodialysis in Mato Grosso state, central Brazil: a cohort study. *BMC Public Health.* 2007 Mar 12;7:32.
6. Guh JY, Lai YH, Yang CY, Chen SC, Chuang WL, Hsu TC, Chen HC, Chang WY, Tsai JH. Impact of decreased serum transaminase levels on the evaluation of viral hepatitis in hemodialysis patients. *Nephron.*1995 ,69 (4):459-65.
7. Chan TM. Hepatitis C virus infection in patients on renal replacement therapy. *Nephrology.* 1995 2(Suppl 1):S 85-S87.
8. Jadoul M, Poignet JL, Geddes C , Locatelli F, Medin C, Krajewska M, Barril G, Scheuermann E, Sonkodi S, Goubau P; HCV Collaborative Group. The changing epidemiology of hepatitis C virus (HCV) infection in hemodialysis, European multicentre study. *Nephrol Dial Transplant.* 2004 Apr; 19(4):904-9.
9. Pereira BJG, Levey AS. Hepatitis C virus infection in dialysis and renal transplantation. *Kidney Int.* 1997 Apr; 51(4):981-99.
10. Afifi A. The Egyptian Renal Registry. The 9th annual report for the year 2008 Published on 29th Annual congress of nephrology of Egyptian Society of Nephrology and Transplantation ESNT Hurghada Egypt 2009.
11. Frank C, Mohamed MK, Strickland GT, Lavanchy D, Arthur RR, Magder LS , El Khoby T, Abdel-Wahab Y, Aly Ohn ES, Anwar W, Sallam I. The role of parenteral antischistosomal therapy in the spread of hepatitis C virus in Egypt. *Lancet.* 2000 Mar 11;355 (9207):887-91.
12. Pol S, Thiers V, Carnot F ,Zins B, Romeo R, Berthelot P, Bréchet C. Efficacy and tolerance of alpha-2b interferon therapy on HCV infection of hemodialyzed patients. *Kidney Int.* 1995 May; 47(5):1412-8.
13. Sampietro M, Baladamenti S, Salvadori S, Corbetta N, Graziani G, Como G, Fiorelli G, Ponticelli C. High prevalence of rare hepatitis C virus in patients treated in the same hemodialysis unit: evidence for nosocomial transmission of HCV. *Kidney Int.* 1995 Mar;47(3):911-7.
14. Umlauff. F. Gruenewald K. Weiss G, Kessler H, Urbanek M, Haun M, Santner B, Koenig P, Keeffe EB. Patterns of hepatitis C viremia in patients receiving hemodialysis. *Am J Gastroenterol.* 1997 Jan; 92(1):73-8.

Editor notes

This short communication provides information on the prevalence of HCV infection among hemodialysis patients in one of the Egyptian governorates. The overall prevalence of HCV antibody positivity was 35% and the six-month seroconversion rate was 11%. In this study, data about the average duration on hemodialysis at inception is missing, but in the majority of Egyptian studies the average duration of hemodialysis is around five years. Since there is no reason to think that the studied governorate is different, the prevalence rate with the given seroconversion rate of 11% is expected to be much higher than 35%.

Assem El-sherif, Associate Editor