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The Epidemiology of Hepatitis C Virus Infection Among Patients Attending the Federal Dental Clinic, Enugu

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Abstract: This study investigated the epidemiology of Hepatitis C Virus (HCV) infection, among the patients attending the dental clinic of the Federal School of Dental Technology and Therapy, Enugu, between July and October 2008. Blood samples randomly collected from 100 patients were screened for hepatitis C virus antibody using Hepatitis C virus test strip (ACON, USA). Out of the 100 samples screened, 1% was positive. Although, HCV prevalence was low among the patients, its presence connotes the possibility of cross infection in dental settings in our environment. Consequently, strict adherence to standard precautionary measures by health and dental workers in Nigeria is hereby suggested.

Key words: Infection, virus, dental, hepatitis C, prevalence

INTRODUCTION

Hepatitis C is an inflammatory process in the liver which is characterized by diffuse hepatocellular necrosis. In addition to viral, bacterial and fungal agents, hepatitis can also be caused by drugs, chemicals and toxins (Falase and Akinkugbe, 2003). Viral hepatitis is mainly a result of infection with hepatitis virus A to G.

Hepatitis C Virus (HCV) is a positive stranded RNA virus classified as family Flaviviridae and genus Hepacivirus (Brooks *et al.*, 2007; Willey *et al.*, 2008). It is a common etiologic agent of post transfusion hepatitis and the mode of transmission is mainly parenteral. Before the development of routine screening, HCV accounted for more than 90% of hepatitis cases developed after a blood transfusion. However, nucleic acid test is invaluable for the proper diagnosis of HCV infection and provides critical prognostic information for guiding treatments and measuring the response to antiviral therapy. Thus, sensitive nucleic acid tests are recommended as confirmation of acute and chronic HCV infection (Scott and Gretch, 2007). Over 1 million new cases of hepatitis C virus infection are reported annually worldwide.

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HCV is a leading reason for liver transplantation in US and Britain (Willey *et al.*, 2008; Talaro and Talaro, 2002; SGM, 2007). The prevalence is said to be highest among intravenous drug users (80%) and least among persons who engage in high sex practices (1%) (Falase and Akinkugbe, 2003; Talaro and Talaro, 2002; Brooks *et al.*, 2007).

Hepatitis C virus can be transmitted from mother to child, though not as frequent as hepatitis B. It has also been found in the saliva from more than a third of patients with HCV and HIV co-infection. As in the case of hepatitis B, Hepatitis C also poses a great threat to health care workers. Transmission has been linked to an attempt to treat the parasitic disease, schistosomiasis, by therapy that involved multiple infections, often with improperly sterilized or reused needles (Willey *et al.*, 2008; Falase and Akinkugbe, 2003). Meanwhile, effective immunotherapy and vaccine against HCV is still awaited (Irshad *et al.*, 2008). The present study determined the prevalence of hepatitis C virus among patients attending the dental clinic of the Federal School of Dental Technology and Therapy, Enugu.

MATERIALS AND METHODS

Population Sample

Forty six females and fifty four males were randomly selected among the patients attending the dental clinic of Federal School of Dental Technology and Therapy, Enugu, Nigeria. The samples were collected between July and October, 2008.

Screening for Hepatitis C Virus

Blood samples were aseptically collected through the veins using 5 mL sterile syringe, and introduced into sterile bijoux bottles containing EDTA (Chessbrough, 2002). The samples were, respectively centrifuged at 2000 rpm for 2 min and the plasma separated. The hepatitis C virus antibody screening was done using the Hepatitis C virus strip (ACON, USA). It was conducted according to the manufacture's instructions.

Interpretation of Result and Ethical Consideration

Positive screening was determined by the appearance of two red bars in both the control and the patient's window strip. The occurrence of only one red bar on the control strip indicated negative screening test. The conduct of this research was with the approval of the research and ethical committee of the Federal School of Dental Technology and Therapy, Enugu. The patients consent was also obtained.

RESULTS

The result of the study showed that, out of the 100 patients screened, 1% yielded positive for hepatitis C virus antibody. Table 1 shows that the positive case was a female patient while Table 2 indicated that the patient belongs to the 21-30 age bracket. Also, Table 3 showed that the positive case was unmarried. The result indicated that the prevalence rate of hepatitis C virus among dental patients in our study environment was low.

Table 1: Prevalence of hepatitis C virus among dental patients with respect to sex

Status	Hep C+	Hep C-
Male	0	54
Female	1	45
Total	1	99

Table 2: Prevalence of hepatitis C virus among dental patients with respect to age

Status	Hep C+	Hep C-
10-20	0	5
21-30	1	34
31-40	0	25
41>	0	54
Total	1	99

Table 3: Prevalence of hepatitis C virus among dental patients with respect to marital status

Status	Hep C+	Hep C-
Married	0	54
Single	1	45
Total	1	99

DISCUSSION

Hepatitis C Virus (HCV) infection remains a major public health challenge especially in the less developed nations where therapy is either unavailable or expensive. Most acute cases become chronic and often results to complications such as Cirrhoses and Cancer (Daniel, 2008). In Britain, HCV is said to be the simple highest cause of people requesting for liver transplants (SGM, 2007). The 1% seroprevalence of HCV reported in the present study is consistent with previous reports in which 1.1% prevalence were respectively recorded among Maxillofacial and Oral Surgery patients at Medunsa and Lao blood donors (Dreyer *et al.*, 1993; Jutavijittum *et al.*, 2007). Higher occurrence has however been reported by various authors; 2.2% among healthy individuals admitted in a University hospital for routine health check (Demirturk *et al.*, 2006); 3.8% among dental patients with impacted teeth or jaw deformities (Takata *et al.*, 2003); 14% among accident and emergency patients (Halim *et al.*, 2001); 14.1% among diabetes mellitus patients in Nigeria (Nwokediuko and Oli, 2008); 26% among patients with gingivitis and adult periodontitis patients (Farghaly *et al.*, 1998); 30.5% among incarcerated male substance abusers in Taiwan (Chu *et al.*, 2009). Generally, high prevalence of HCV infection has been associated with intravenous drug users (Alter *et al.*, 1990). The fact that intravenous drug usage is an uncommon practice in our environment could possibly be a reason for the low occurrence in our study population.

Although, the prevalence of HCV in this study among dental patients was low, it nevertheless poses a risk to dental health practitioners. Ironically, in our target institution, patients are not pre-screened for HCV before treatment. Thus, health care workers and clinical students handle their patients without any knowledge of their HCV status. In this connection, a call is hereby made for strict adherence to standard precautionary measures by all dental professionals to avert cross infection, especially at the present time when viable HCV vaccine is yet to be ascertained.

While the present study apparently highlighted the occurrence of HCV among patients and consequently, the prevention of cross infection to health care workers, some previous studies have reported the risk of transmission of HCV from health care workers to patients (Gerlich, 2004). Infact, Martinez-Bauer *et al.* (2008) reported that hospital admission accounted for over 50% of the risk factors for HCV acquisition by patients. It is therefore an impelling necessity for health care workers to be prescreened for HCV before handling patients. Infected health care workers should be prevented from attending to patients in which exposure to blood and body fluid may be involved. In addition, care must be taken to ensure adequate sterilization of all dental instruments used for the treatment of patients.

Although, the positive case as recorded in the present study was observed in a female patient (Table 1), a previous work did not identify any significant difference between the occurrence in males and females (Jutavijittum *et al.*, 2007). It is therefore most likely that sex is not a risk factor in HCV occurrence. Similarly, that the positive female patient was single and within the sexually active age bracket (21-30) may not necessarily be a strong factor in the virus acquisition, since the importance of sexual transmission of HCV is still debated (Tankhiwale *et al.*, 2003).

In conclusion, despite the low prevalence recorded in the present study, it is obvious that HCV is one of the occupational infections worthy of note in our environment. The limitations of successful therapy and absence of vaccines (Irshad *et al.*, 2008) underscores the urgent necessity for all health and dental professionals as well as clinical students to strictly adhere to standard precautionary measures to avoid cross infection in dental settings. Carefulness costs a little, but the cost of recklessness could be very weighty and the consequences devastating.

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