

# Prevalence of Hepatitis B and C Viruses among Patients Who Underwent Dental Interventions in a Dental Care Units at College of Dentistry, Duhok, Kurdistan.

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## ABSTRACT

**Background:** The aim of this study was to determine the prevalence of hepatitis B virus (HBV) and hepatitis C virus (HCV) among patients who attended to undergo dental procedures in a dental care units at College of Dentistry, Duhok, Kurdistan. Furthermore, is it necessary to include routine screening of Hepatitis B surface antigen (HBsAg) and anti-HCV in the dental care setting? **Methods:** The study was conducted prospectively at Dental care units at College of dentistry in Duhok province from February 2016 – November 2016. The patients' demographic profile was recorded. Blood samples were tested for the presence of HBsAg and anti-HCV at the virology department of Azadi teaching hospital by using enzyme-linked immunosorbent assay (ELISA) technique. The results obtained were analyzed by entering the data in a binary format as a Microsoft Excel spreadsheet. **Results:** Out of 301 patients, there were 154 (51.16%) male with a mean age of 34.63 years ( $\pm$  11.04). The prevalence of HBV, HCV and combined HBV + HCV was 1.99%, 0 and 0, respectively. The most common age group in this study was 26-50 yr (220; 66,45%), while the highest sero-positivity of HBsAg (3.17%) was in the age group 0-25 yr. The frequency of HBsAg in male and female was 2.60% and 1.36%, respectively; whereas, the frequency of HCV antibody was zero in both genders. **Conclusion:** HBV should be considered seriously in patients attending for dental care. Pre-dental intervention screening for HBsAg is a reasonable policy, particularly in younger aged (< 25 year) patients. All dental HCWs should adhere to infection control measures and they should be vaccinated against HBV to reduce the risk of occupational transmission of HBV and HCV. We did not find any case of HCV in this study, which confirms it has a very low prevalence in our region.

**Keywords:** Dental patients, HBV, HCV, college of dentistry

## INTRODUCTION

Hepatitis B, and C viruses are potential causes of chronic hepatitis, liver cirrhosis and hepatocellular carcinoma (HCC).<sup>[1]</sup> Globally, hepatitis B virus (HBV) results in approximately 2 billion human infections and 350-400 million (more than 5% of the world's population) chronic infections.<sup>[2]</sup> The laboratory diagnosis of HBV infection is made through serological and virological markers. Among these, hepatitis B surface antigen (HBsAg) is the hallmark of the infection. However, other markers are essentially important in differentiating between active and inactive infections. Of note, hepatitis B

Early antigen (HBeAg) is indicative of active viral replication.<sup>[3]</sup> Hepatitis C virus (HCV) infects approximately 175 million people (more than 2.3% of the world population).<sup>[4]</sup> The diagnosis of HCV is based on positive HCV antibody and it can be confirmed by molecular detection of HCV-RNA in the blood.<sup>[5]</sup> The mode of HBV and HCV transmission is through cutaneous and mucosal exposure to the blood and body fluids of the infected patients.<sup>[6]</sup> Occupational transmission of HBV and HCV is a major problem in clinical care settings. It is estimated that the annual incidence of occupational exposure to the blood borne pathogens is more than 2 million injuries that causes about 66,000 HBV, 16,000 HCV and about 1,000 HIV infections among 35 million health care workers each year.<sup>[7]</sup> The typical risk of viral hepatitis transmission is predominately determined by the prevalence of such infection in a general population.<sup>[8]</sup> Iraq has an intermediate prevalence of HBV and HCV infection.<sup>[9]</sup> This pattern of

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prevalence is in favor of occupational transmission of HBV and HCV including those occurring in dental care setting.<sup>[10]</sup> Hence, we tried to determine the prevalence of HBV and HCV among patients who attended to undergo dental procedures in a dental care units at College of Dentistry, Duhok, Kurdistan. Furthermore, is it necessary to include routine screening of HBsAg and Anti-HCV in the dental care setting?

## MATERIALS AND METHODS

### Setting

Dental care units at College of dentistry is a specialized teaching tertiary care units dealing with the treatment of all dental procedures from Duhok’s province. The dental procedures include: dental abscess treatment, dental extraction, dental filing, dental hygiene, periodontal treatment, mouth surgery, endodontic treatment, fluoride treatment, and restorative dentistry.

### Study design and patients

The study was performed prospectively on patients who attended dental care from February 2016 – November 2016. It includes all patients who accepted to participate in a blood test for HBsAg and anti-HCV. The patients’ demographic profile including age and sex were recorded. Blood samples were drawn in the routine manner at the Azadi Teaching Hospital laboratory, Duhok, Kurdistan. Five ml samples were then tested for the presence of HBsAg and HCV antibody at the virology department using enzyme-linked immunosorbent assay (ELISA) technique (Fortress Diagnostics Limited, Antrim, United Kingdom) according to the manufacturer instructions.<sup>[11,12]</sup>

Statistical analysis: The results obtained were analyzed by entering the data in a binary format as a Microsoft Excel spreadsheet.

## RESULTS

Out of 301 patients, there were 154 (51.16%) male with a mean age of 34.63 years ( $\pm$  11.04). The prevalence of HBV, HCV and combined HBV + HCV was 1.99%, 0 and 0, respectively [Table 1].

**Table 1: Characteristics of the study population (no. = 301)**

Variable		No (%)
Age (yr)	Mean $\pm$ SD	34.63 $\pm$ 11.04
	Male	154 (51.16)
Sex	Female	147 (48.84)
	HBV	6 (1.99)
Viral infection	HCV	0 (0.0)
	HBV + HCV	0 (0.0)

The most common age group in this study was 26-50 yr (220; 66,45%), while the highest sero-positivity of HBsAg (3.17%) was in the age group 0-25 yr [Table 2].

The frequency of HBsAg in male and female was 2.60% and 1.36%, respectively; whereas, the frequency of HCV antibody was zero in both genders [Table 3].

**Table 2: Prevalence of HBV and HCV infected patients according to the age group (no. = 301).**

Age group	HBsAg positive No. (%)	Anti-HCV positive No. (%)	Total patients
0-25	2 (3.17)	0 (0)	63
26-50	4 (1.82)	0 (0)	220
>50	0 (0)	0 (0)	18
Total	6 (1.99)	0 (0)	301

**Table 3: Prevalence of HBV and HCV infected patients according to their gender (No. = 301).**

Serologic marker	Male (154)	Female (147)	Total (301)
HBsAg positive	4 (2.6%)	2 (1.36%)	6 (1.99)
Anti-HCV positive	0 (0.0%)	0 (0.0%)	0 (0.0%)

## DISCUSSION

Occupational transmission of blood borne hepatitis viruses may occur in the health care setting as a result of a surgical intervention in an outpatient dental circumstance where contact transmission may happen. The current study is aimed to provide an idea about seroprevalence of such viruses in patients who visited dental clinics at the college of dentistry, University of Duhok for dental treatment. In the present study, the prevalence of HBV and HCV was 1.99 and 0.0, respectively. The figure is in agreement with our previous study from a tertiary care referral hospital in Duhok’s province.<sup>[13]</sup> Similarly, in our recent report, the prevalence of HBsAg and anti-HCV in tuberculosis patients were 1.87 and 0.47, respectively.<sup>[14]</sup> All the aforementioned studies indicate a low prevalence rate of HBV and HCV in our locality, although they were not representative of actual prevalence of the viruses because they were not population based cohort studies. In this study, the frequency of HBV and HCV infections were lower compared to reports from surrounding countries in the region e.g. Iran and Turkey,<sup>[15,16]</sup> whereas the prevalence of HBV was higher than some countries, e.g. Switzerland.<sup>[17]</sup> In general, the zero prevalence result of HCV in our study, confirms the very low prevalence of this virus in our region.<sup>[13,14]</sup> Although seropositive HBV and HCV patients act as a potential infectious risk for dental health workers and dental patients, their prevalence rate did not differ with general population. Despite accidental needle stick injuries, the rate of HCV infection among dental and medical care workers is similar or even less than that of the general population.<sup>[18]</sup> On the contrary, few studies have suggested that dental care workers may have an increased risk of acquiring such viruses.<sup>[19]</sup> In our previous study, we documented dental intervention as an independent risk factor for HBV in a specific population of

patients.<sup>[14]</sup> In the current study, the age group of 0–25 year olds showed the highest rate of HBV prevalence, which may document the high rate vertical transmission from mother to fetus.<sup>[9]</sup> Although this finding is discrepant with the low prevalence of HBV in this study, it may indicate intermediate – high seroprevalence of HBV in our locality. Hence, it is highly recommended to screen dental patients for HBsAg in such age group. As a matter of fact, the young group in this study might be biased due to the overall young aged patients included in this study (mean age = 34.63 years ( $\pm$  11.04)). Our study demonstrated predominance of hepatitis B in male sex (2.6%), which were in support to the finding of our previous reports.<sup>[13,14]</sup> The finding is consistent with other literatures.<sup>[20]</sup> The higher rate of HBV in men can be explained by a greater exposure to this virus through high risk jobs and sexual activities. In contrast, other studies have shown lower frequency of HBV among male gender.<sup>[21]</sup> A large general population based study with proper geographical distribution can confirm actual gender predominance in our region. The main limitation in this study was the small sample size of patients. In addition, we did not perform polymerase chain reaction of viral genome for early detection of such infections before the appearance of HBsAg or anti-HCV in the plasma. To conclude, in keeping with recorded literatures, HBV should be considered seriously in patients attending for dental care. Pre-dental intervention screening for HBsAg is a reasonable policy, particularly in younger aged (< 25 year) patients. All dental HCWs should adhere to infection control measures and they should be vaccinated against HBV to reduce the risk of occupational transmission of HBV and HCV. We did not find any case of HCV in this study, which confirms it has a very low prevalence in our region.

### CONCLUSION

HBV should be considered seriously in patients attending for dental care. Pre-dental intervention screening for HBsAg is a reasonable policy, particularly in younger aged (< 25 year) patients. All dental HCWs should adhere to infection control measures and they should be vaccinated against HBV to reduce the risk of occupational transmission of HBV and HCV. We did not find any case of HCV in this study, which confirms it has a very low prevalence in our region.

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