

An update of Seroprevalence of HBV among healthcare workers in Yemen: a review of data published between 2001 and 2020

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Abstract

Hepatitis B virus (HBV) infection is a major global health problem. Healthcare workers (HCWs) are at high risk of HBV infection. The aim of this review was to summarize HBV seroprevalence in HCWs in Yemen. Electronic databases (PubMed, Google Scholar, and Google) had been used to search for studies on HBV seroprevalence in HCWs in Yemen. Among 1119 HCWS seem in this review, 78 (6.97%) were seropositive for HBV infection. HBV infection correlated significantly with HCWs. HCWs (2.76%-21.4%) infected with HBV. HCWs in Yemen are considered at moderate to high risk of HBV infection according to WHO classification. The prevalence of HBV infection in recent years decreased compared with that published during 2001-2004.

Keywords: Hepatitis B Virus; Healthcare Workers; Needle Stick injuries; HBsAg; Yemen.

1. Introduction

Hepatitis B virus (HBV) is an enveloped dsDNA virus that belongs to *hepadnaviridae*. HBV infects the liver and replicates in hepatocytes [1]. Depending on genetic variation, HBV can be divided into ten genotypes (A to J). In addition, HBV can be further classified into subgenotypes such as A1,A2,B1,B2,C1,C2,D1 and D2 [2]. HBV infects the liver that can be causes inflammation. In addition, it can be acute or chronic, and the connected sickness extent in severity from asymptomatic to symptomatic, advanced diseases that may be lead to cirrhosis and hepatocellular carcinoma [1]. Overall, world health organization (WHO) reported that almost 257 million persons have chronic HBV infection. They represent 3.5% of the world population. As well, WHO indicated that 1.34 million people died from hepatitis in 2015. Among them, 66% suffered from chronic HBV infection complications [3].

Previous study reported that genotypes A and D are distributed in Yemen. Genotype D is distributed in different Yemen regions, while genotype A restricted to Soqotrans [4]. In Yemen, over all prevalence varies from 8% to 20% for HBsAg [5], whereas another study estimated that HBsAg overall prevalence of 15% in Sana'a, 6.7% in Aden, 26.3% in Soqatra [6] and 4.2% in Taiz [7]. Therefore, Yemen is classified as a high endemic geographic area of HBV [5].

HBV is transmitted via percutaneous or mucosal membrane exposure to blood or body fluid of an infected person through blood transfusion, needle stick injuries, sexual contact, intravenous and intramuscular routes and, perinatal transmission [8].

Healthcare works (HCWs) consider a population at a high risk of developing HBV infections due to their close contact with HBV seropositive patients [9]. In 2010, approximately 1,679000 persons were infected with HBV by unsafe injections [3]. Previous surveys were carried out in European Union and showed that the prevalence of HBsAg among

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HCWs ranged from 0.6-1.2% in Poland to 2.2% in Romania with occupational exposure [10]. However, in African regions were reported the occupational exposure level (OEL) to HBsAg positive blood and body fluids are 7.8%, 5.7%, 4% and, 1.5% in Nigeria, Tanzania, Kenya and, Egypt respectively [11-14]. As well as, HCWs in Nigeria are at a high risk of exposure to needle stick injuries by 74.8% while intern doctors by 34.8%v[11]. Although, in Asian regions preceding studies were showed that HCWs were at low risks of HBV infections with exposure rates of 0.2%, 0.3%, 0.3% in Indian, Saudi Arabia and, Turkey respectively [15-17]. Interestingly, the prevalence of HBV infection was zero among HCWs in South Korea [18]. As well, in China new study was suggested the sharp injuries were the most source of HBV for HCW [19]. In Yemen, HCWs are at a high risk of HBV infection and other blood borne viruses. Infection exposure level increases due to inappropriate procedures such as recapping needles, improper manipulation of disposal needle and, unsafe needle disposal [20]. Therefore, this review aimed to reanalyze the studies related to HBV infection among HCWs in Yemen and link it with most risk factors.

Table 1 Studies related to HBV among HCWs in Yemen between 2001 and 2020

Author	Title of study	Published year	Infected	Non-infected	Total
Al Nassiri and Raja'a [21]	Hepatitis B infection in Yemenis in Sana'a: pattern and risk factor	2001	3 (21.4%)	11	14
Shidrawi <i>et al</i> [22]	Seroprevalence of Markers of Viral Hepatitis in Yemeni Healthcare Workers	2004	54 (9.9%)	489	543
Al Waleedi and Khader [23]	Prevalence of hepatitis B and C infections and associated factors among blood donors in Aden city, Yemen	2012	2 (6.4%)	29	31
Al Makdad <i>et al</i> [24]	Hepatitis B Virus Infection among Resident Physicians and Nurses in Tertiary Hospitals in Sana'a City, Yemen	2020	9 (5.6%)	160	169
Waheed <i>et al</i> [25]	Vaccination status and Seroprevalence of Hepatitis B surface Antigen among Health Care Workers in Taiz Yemen Republic	2020	10 (2.76%)	352	362
Total			78 (6.97%)	1041	1119

2. Materials and methods

In this study, a systematic review was carried out to reanalyze the seroprevalence of HBV infection among HCWs in Yemen between 2001 and 2020. Five studies were found in PubMed, Google scholar and, Google related to this problem. All details of these studies were list in table 1. Data analysis was performed by using SPSS. The frequency, percentage, arithmetic mean, and mode were used to present the data. A value of $p < 0.05$ was considered statistically significant.

3. Result

A total of 1119 HCWs were involved in this study, according to previous research. Almost 78 (6.97%) were HBsAg positive. Results showed the general prevalence of HBV among HCWs in Yemen. There was a high correlation between HBV infection and HCWs. In addition, the prevalence of HBV infection among HCWs in Yemen 4- folds decreased Figure 1. Also, the studies showed heterogeneity (Test for heterogeneity: $df=1$, $p<0.05$).

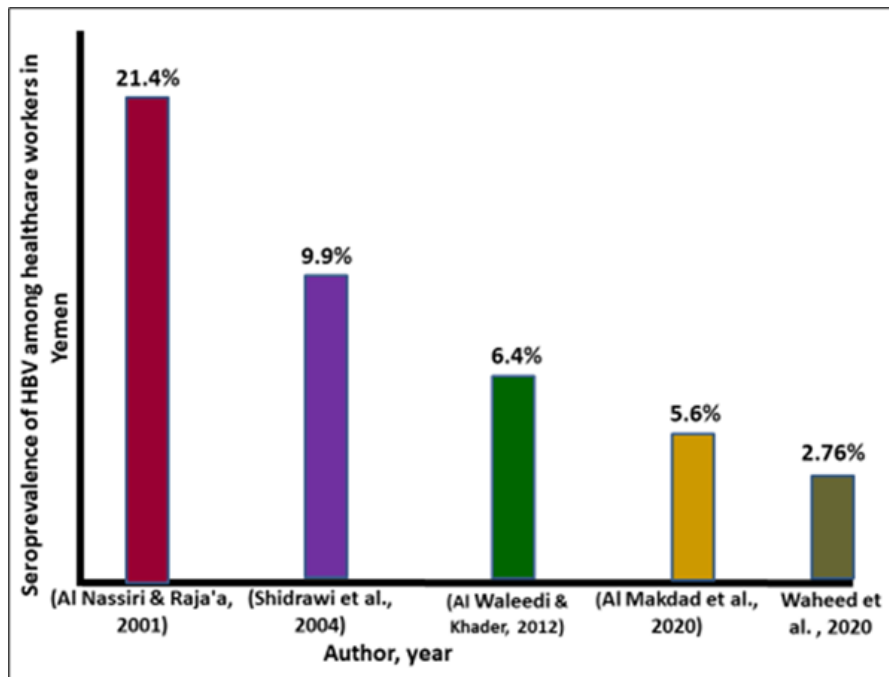


Figure 1 Figure showed decrease on HBV seroprevalence among HCWs in Yemen.

4. Discussion

Exposure to body fluids, especially blood, has been recognized as a potential health hazard in HCWs [26].

Likewise, limited data is available on seroprevalence of HBV infection among HCWs in Yemen. This systematic review compared the prevalence of HBV infection among HCWs in Yemen between 2001 and 2020. A total of 1119 HCWs were included in the five studies. Almost 78 (7%) HCWs were positive for HBV infection. There was a significant correlation between the rate of occupational exposure and HBV infection ($p < 0.05$). According to WHO, HCWs are at intermediate risk of HBV infection in Yemen [1]. This value is nearly similar to data was published in Yemen in 2015 [27]. Although, Alqahtani and his colleagues reported that prevalence of HBV infection was 0.3% among HCWs in Najran, Saudi Arabia. HCWs were at a very low risk of HBV infection in Najran [16].

Low HBV prevalence in Saudi Arabia indicates the role of vaccination and educational programs to eliminate HBV infection among HCWs. Previous studies have shown that the needle stick injury (NSI) was the key risk factor of HBV infection among HCWs [22, 20, 28, 24, 21, 29, 25]

In Yemen, the prevalence of HBV infection varied from town to town as Taiz and Sana'a and reduced from year to year, as indicated through many studies [22, 25, 24]. The HBV prevalence reduced from 9.9% [22] to 2.76% [25]. HBV prevalence decreased in HCWs due to introduce of HBV vaccines into national immunization programs. In addition, educational programs improved HCWs knowledge about risk factors for HBV transmission.

In contrast, HCWs were at low risk of HBV infections in other countries such as Poland, South Korea, Indian and, Turkey due to good training and effective vaccination programs. Generally, HCWs remain at a intermediate risk of HBV infection in Yemen.

5. Conclusion

The occupational risk of HBV infection among HCWs was intermediate in Yemen. HBV vaccine and training programs should be readily available for HCWs. HCWs must train on the basic principles of HBV infection, especially transmission routes, prevention strategies and, treatment options.

More researches must carry out to figure out HBV infection among HCWs in Yemen.

Limitations of the study

Limit of researches on HBV infection among HCWs in Yemen.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Author Contribution

Fahd A.A. Al-Romima analyzes the data and pre-writes of manuscript.

Adam Hezam Faed Al-Shamiri supervises the manuscript and checks it.

Ashwaq Ahmed Abdullah supervises the manuscript and checks it.

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