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Abhath Journal for Basic and Applied Sciences – Faculty of Education – Hodeidah University

Hodeidah – Yemen Republic

P. O. Box (3114)

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Contents of the Issue

Introduction of the Issue

We are pleased and delighted to present the researchers with this issue of the 'Abhath' Journal of Basic and Applied Sciences, which is the first issue of the first volume, the issuance of which emanates as an affirmation of moving forward towards issuing specialized quality journals.

The Faculty of Education at Hodeidah University aims, by issuing this journal, to publish specialized researches in basic and applied sciences, from inside and outside Yemen, in the English language.

On this occasion, the journal invites male and female researchers to submit their researches for publication in the next issues of the journal.

In conclusion, the editorial board of the journal extends its thanks and gratitude to Prof. Mohammed Al-Ahdal – Rector of the university – the general supervisor of the journal, for his support and encouragement for the establishment of this journal. Furthermore, thanks are extended to Prof. Mohammed Bulghaith – University Vice-Rector for Higher Studies and Scientific Research – vice-supervisor of the journal, for his cooperation in facilitating the procedures for the issuance of this issue. Nevertheless, thanks are for all researchers whose scientific articles were published in this issue, and for the editorial board of the journal, which worked tirelessly to produce this issue in this honorable way.

Journal Chief Editor

Prof. Yusuf Al-Ojaily

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Prevalence of Hepatitis B Virus among Sickle Cell Anemic Patients in Bait Al-Faqeeh, Al-Hodeidah Governorate, Yemen.

Adel Yahya Hasan Kudhari and Ahmed Yehia Al-Jaufy*

Faculty of Medicine and Health Science, Sana'a University

adelkhathri2014@gmai.com & aljaufy@yahoo.com

Abstract. Hepatitis B infection continues to be a problem in many parts of the world, despite the progresses made in the prevention against hepatitis B over the last few years, particularly in Yemeni sickle cell anemic patients. This study was aimed to determine the prevalence of hepatitis B virus infection and identify the potential risk factors of hepatitis B infection in sickle cell anemic patients in Bait Al-Faqeeh district, Al-Hodeidah governorate, Yemen.

One hundred sickle cell anemic patients (63 males and 37 females) were included in this study. They were selected randomly from the Rural Bait Al-Faqeeh hospital and AL-Amal Health Center during the period June 2016 to June 2017. Sociodemographic characteristics and data about the possible risk factors were collected from each patients by using a predesigned questionnaire. Hepatitis B surface antigen was measured using a Electro-chemiluminescence immunoassay (ECLIA) technique. Hepatitis B surface antigen was found in 35 patients (35%). There was no statistical significant association between hepatitis B virus infection and gender in sickle cell anemic patients (p = 0.187). Concerning the age groups of studied patients, the highest rates of hepatitis B virus infection were noticed in the age group of 12–22 years old (39.4%), but no statistical significant association was found (p> 0.05). There was no statistical significant association between hepatitis B virus infection and risk factors including the blood transfusion, surgical operation, injury

* Correspondence author: A. Y. Al-Jaufy

and dental visiting ($p > 0.05$). It can be concluded that hepatitis B virus infection is still a major health problem among sickle cell anemic patients in Bait Al-Faqeeh district.

Introduction

Hepatitis B virus (HBV) is a serious public health problem worldwide and major cause of chronic hepatitis, cirrhosis and hepatocellular carcinoma (HCC). The impact of HBV infection on public health is enormous, with an estimated prevalence of 2 billion infected and 378 million chronically infected (Franco *et al*, 2012; Liu and Yao, 2015).

Hepatitis B virus is transmitted by contact with infected blood and body fluids. Several studies have already reported the transmission by sharing infected objects. Therefore, drug users, who share syringes and other objects contaminated with blood, usually have a high risk of HBV infection (Matos *et al*., 2013; Degenhardt *et al*., 2016). This situation also occurs in case of patients or health professionals infected by handling HBV-contaminated medical devices (Bârlean *et al*., 2014; Diercke *et al*., 2015). On the contrary, transmission within the family is less reported (Shepard *et al*., 2006), although some previous studies have demonstrated that sharing personal objects with family members (e.g., safety razor, dishes, cutlery, glasses, face towels, and toothbrush) is strongly associated with HBV transmission (Lobato *et al*., 2006; Nazzal and Sobuh, 2014). In developed countries, most new infections are related to contaminated blood transfusion, intravenous drug abuse, haemodialysis (HD), acupuncture, tattooing and sharing razors (EL-Shabrawi *et al*., 2013; Gogoi *et al*., 2015).

Sickle cell disease (SCD) and its variants are genetic disorders resulting from the presence of a mutated form of hemoglobin (Hb) known as HbS (Strouse, 2016). SCD is a group of genetic disorders having in common the production of the abnormal HbS instead of HbA. Sickle cell anemia (SCA), *i.e*. the homozygous form of SCD, results from a single base mutation in exon 1 of the β-globin gene which causes

the substitution of valine for glutamic acid at the sixth position of the β-globin chain (Rees *et al*., 2010). SCA is characterized by painful vaso-occlusive episodes and susceptibility to infections of bacterial, fungal or viral origin (Steinberg, 2009). In SCA, inflammation may occur in acute or chronic forms involving a series of cellular interactions mediated by inflammatory cytokines (Hoppe, 2014).

Because patients with SCD lack enough red blood cells for life sustenance they require frequent blood donation. They are therefore susceptible to blood borne infections such as malaria, hepatitis B, hepatitis C and human immunodeficiency virus (HIV) (Ocak *et al*., 2006). HBV is of high interest in SCA patients because they are chronic blood recipients as a result of frequent anemia. They are, therefore, potentially at high risk of HBV infection (Fasola *et al*., 2003).

The prevalence of HBsAg among blood donors was 5.05% in Yemen (WHO, 2016a), a recent study demonstrates that the prevalence of HBV and hepatitis C virus (HCV) infections is high (14.5% and 1.6%), respectively among adult males in Bait Al–Faqih District, Al-Hodeidah governorate, Republic of Yemen (Al-Kadassy *et al*., 2017).

Study of the hepatitis B among SCA group is very important because they are chronic blood recipients as a result of frequent anemia, they are, therefore, potentially at high risk of HBV infection and due to dearth of information on the prevalence of HBV in SCD in Al-Hodeida governorate, this study was performed to determine the seropositivity and the risk factors of hepatitis B infection among SCD in Bait Al-Faqih district, Al-Hodeidah governorate, Republic of Yemen.

Subjects and Methods

Atotal number of 100 patients of SCA were investigated for the presence of HBsAg in their sera. All information related to each SCAP was obtained through a predesigned questionnaire that included the sociodemographic information and predisposing factors. This cross sectional study was carried out in two health establishments; one public (Rural Bait Al-Faqih Hospital) and the other is private (Al-Amal Health

Center) located in Bait Al-Faqih district, Al-Hodeida governorate, Yemen during a period of one year. Three ml of venous blood was collected from each patient into a plain tube, serum of patients were examined for detection of HBsAg by using an Electro-

chemiluminescence immunoassay (ECLIA) method according to the manufacturer procedure.

Results

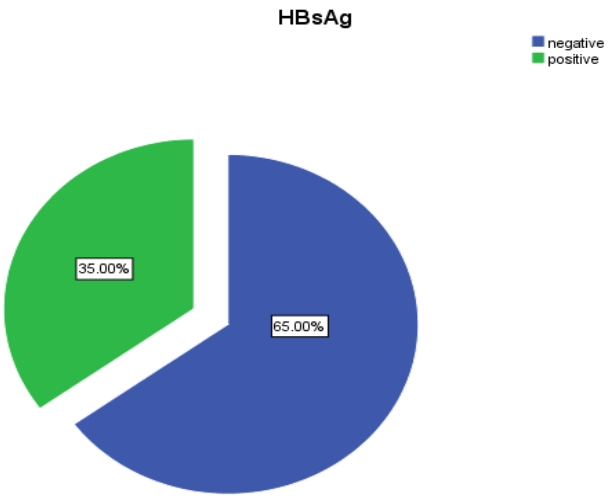
A total number of 100 sickle cell anemic patients (SCAPs), 63 (63%) males and 37 (37%) females, were enrolled in this study. Their age ranged from 1 to 45 years with a median age was 10 (1 - 45) years.

Table (1): The association between HBsAg, sex and different age groups of the studied patients, in Bait Al-Faqeeh district, Al-Hodeidah governorate.

Parameters	HBsAg				Total		OR	CI	χ^2	P
sex	**Positive**		**Negative**							
	No.	**%**	**No.**	**%**	**No.**	**%**				
Male	19	30.2	44	69.8	63	63				
Female	16	43.2	21	56.8	37	37		0.759 –4.10	1.75	0.185
Total	35	35	65	65	10 0	100.0	1.8			
Age-group (yrs) 1-11	18	32.7	37	67.3	55	55.0				
12-22	13	39.4	20	60.6	33	33.0				
23-33	3	37.5	5	62.5	8	8.0		–	0.603	0.896
34-45	1	25.0	3	75.0	4	4.0				
Total	35	35.0	65	65.0	100	100.0	–			

OR:Odds ratio >1 (**at risk**), **CI**Confidence intervals, χ^2**:**Chi-square ≥3.9 **and P -**value <0.05 (**significant)**.

Figure (1): Prevalence of hepatitis B virus among SCAPs in Bait Al-Faqeeh, Al-Hodeidah governorate.



As shown in figure 1, out of 100 SCAPs, 35 patients (35%) were found to be positive for HBV while 65 patients (65%) were found to be negative for HBV. Table 1 shows the association between HBsAg infection, sex and different age groups of the studied patients. The rate of HBsAg among SCAPs females (43.2%) were higher than that of SCAPs males (30.2%) with an odds ratio equal to 1.8 times for females than males**.** No statistical significance was observed ($p > 0.05$). Also, shows the HBsAg infection rate was highest in the age group 12–22 years in which the rate was 39.4%, followed by the age group 23–33 years (37.5%), then the age group1–11 years (32.7%), and the least rate was found at the age group 34-45 years (25.0%). No statistical significance was observed ($p > 0.05$).

Table (2): Potential risk factors of HBsAg among SCAPs in Bait Al-Faqeeh district, Al-Hodeidah governorate.

Parameters	HBsAg				Total		OR	CI	χ^2	*P*
Blood transfusion	**Positive**		**Negative**							
	No.	%	No.	%	No.	%				
Yes	35	35.0	64	64.0	99	99.0	-	-	0.54	0.461
No	0	0.0	1	1.0	1	1.0				
Total	35	35.0	65	65.0	100	100.0				
Surgical history *Yes*	1	25.0	3	75.0	4	4.0	1.417	0.254-7.901	0.183	0.669
No	34	35.4	62	64.6	96	96.0				
Total	35	35.0	65	65.0	100	100.0				
Injury *Yes*	2	100.0	0	0.0	2	2.0	0.337	0.445-0.255	3.790	0.120
No	33	33.7	65	66.3	98	98.0				
Total	35	35.0	65	65.0	100	100.0				
Dental visiting *Yes*	1	100.0	0	0.0	1	1.0	0.343	0.451-0.262	1.876	0.171
No	34	34.3	65	65.7	99	99.0				
Total	35	35.0	65	65.0	100	100.0				

OR Odds ratio >1 (**at risk**)
CI Confidence intervals
χ^2 Chi-square ≥3.9 (**significant***)*
P Probability value <0.05 (**significant**)

Table 2 shows potential risk factors of HBsAg associated with

blood transfusion among studied patients. 99% of studied patients were blood transfused, out of them 35% were HBsAg positive. The presence of HBsAg among patients were not significantly associated with blood transfusion ($p > 0.05$). Also, shows potential risk factors of HBsAg associated with surgical history among studied patients. 4% of the studied patients had surgical history, out of them 25% were HBsAg positive. The presence of HBsAg among patients were not significantly associated with surgical history ($p > 0.05$). Also, shows potential risk factor of HBsAg associated with injury among sickle cell anemic patients. 2% out of the studied patients had injury, all of them were HBsAg positive. The presence of HBsAg among patients were not significantly associated with injury ($p > 0.05$). Also, shows potential risk factors of HBsAg associated with dental visiting among sickle cell anemic patients. 1% of the studied patients had dental visiting,all of them were HBsAg positive. The presence of HBsAg among patients were not significantly associated with dental visiting ($p > 0.05$).

Table (3): The association of HBsAg with frequency of blood transfusion among SCAPS in Bait Al-Faqeeh district, Al-Hodeidah governorate.

Blood transfusion./ time	**HBsAg Positive =35**		**HBsAg Negative =65**		**Total**		**OR**	**95% CI**	***χ 2**	**P value**
	No	%	No	%	No	%				
Once	3	37.5	5	62.5	8	8.0	1.04	0.333-3.48	0.094	0.772
4- times	6	31.6	13	68.4	19	19.0				
>4 times	26	36.1	46	63.9	72	72.0				
Total	35	35.0	64	64.0	99	99.0				

OR Odds ratio >1 (**at risk**)
CI Confidence intervals
*χ^2 Fisher Exact and ***p :*** Probability value <0.05 (**significant**)

Table 3 shows the association of HBsAg with frequency of blood transfusion among sickle cell anemic patients. The HBsAg rate among patients with one time blood transfusion was 37.5%, followed by > 4 times blood transfusion (36.1%) while the rate of HBsAg for those with 4 times blood transfusion was 31.6%. No statistical significance was found in this table ($p > 0.05$).

Table (4). The association of HBsAg with source of blood transfusion among SCAPs in Bait Al-Faqeeh district, Al-Hodeidah governorate.

Sources of blood transfusion	HBsAg Positive =35		Total		OR	95% CI	*χ^2	*P*
	No	%	No	%				
Bait- Al-Faqeeh	26	32.9	79	79.0	–-	–-	0.721	0.445
Bait- Al-Faqeeh and Al- Hodeidah	9	47.4	19	19.0	–-	–-	1.577	0.285
Al-Hodeidah and Sana'a	0	0.0	1	1.0	–-	–-	0.544	1.000
Total	35	35.0	99	99.0	–	–	0.544	1.000

Table 4 shows the association of HBsAg with source of blood transfusion among sickle cell anemic patients. The highest rate of HBsAg among studied patients was in Bait- Al-Faqeeh and Al-Hodeidah (47.4%) followed by Bait Al-Faqeeh (32.9%), but absent in Al-Hodeidah and Sana'a as sources of blood transfusion. No statistical significance was found in this table ($p > 0.05$).

Discussion

Hepatitis B is a disease of significant public health impact. Prevention strategies are important for the effective control of this infection, including universal vaccination and the use of immunoglobulin in certain

situations. For this purpose, data about prevalence rates are needed, especially in populations at risk for disease transmission, such as SCAPs. Transfusion-transmitted hepatitis is an emerging public health in many parts of the world, mainly in regions where blood screening practices are poor and the prevalence of parenterally transmitted infections among blood donors is high (Singh *et al*., 2003; de *et al*., 2005). SCAPs have a high risk of acquiring hepatitis B and C and other blood born infections.

The present study is the first one in Bait Al-Faqeeh district, Al-Hodeida governorate that covers this issue and aimed to determine the prevalence of HBV infection in sera of sickle cell anemic patients. In the present study, the prevalence of HBsAg among SCAPs in Bait Al-Faqeeh district, Al-Hodeida governorate, Republic of Yemen was 35.0%. This rate is much higher compared to previous studies carried out in Yemen, where the prevalence of HBV was 2.1% among sickle cell anemic patients and 6.9% among multi-transfused patients in Sana'a city (Ghalib, 2014), whereas it was 22.4% among sickle cell anemic patients in Aden (Qhalib and Zain, 2014). Other studies conducted in different countries indicated low rates for HBV among SCAPs : 0.95% in Saudi Arabia (Al-Suliman *et al*., 2013), 1.8% in Iran (Ghafourian et al., 2013), 2.1% in Turkia (Asma *et al*., 2013), 2.9% in India (Vinod *et al*., 2015), 3.1% in Brazil (Jose *et al*., 2010), 3.5% in Ghana (Antwi *et al*., 2014), 7.3% in King Salman Armed Forces Hospital, Kingdom of Saudi Arabia (Khan *et al*., 2015), 17.3% in Nigeria (Jibrin *et al*., 2014), 17.7% in Nigeria (Onuchukwu *et al*., 2012) 7.3% in King Salman Armed Forces Hospital, Kingdom of Saudi Arabia (Khan et al., 2015).

The very high prevalence recorded in this study is correlated with a previous study conducted in the same area where the prevalence of HBV was 14.5% in adult males in Bait Al-Faqeeh district (Al-Kadassy et al., 2017), indicating a reflection of the hyper-endemicity of HBV infection in Bait Al-Faqeeh district, Al-Hodeida governorate. Also these findings

may be related to increased poverty, use of sharp objects not sterilized in rural area, poor medical services, including absent vaccines coverage of the rural population , widespread illiteracy and low level of awareness about various risks factors of the HBV infection, especially the older ones in this area, also the reuse of unsterilized syringes and shaving razors (Asad *et al*., 2015; Heijnen *et al*., 2016), as well as poor screening techniques for detecting of HBsAg in blood transfusion centers (Nsiah *et al*., 2012). Also it might be explained by increased exposure to the repeated hospitalization and injections. Also due to the recent conditions and absent the medical services were play much role in increase rate of HBV infection among SCAPs.

In the present study, the prevalence rates of HBV infection were higher among females than male patients, being 43.2% and 30.2%, respectively. The high prevalence of female patients was the common pattern in most studies among sickle cell anemic patients, but no significant association were recorded (p>0.05). Moreover, this result was similar to previous studies carried out in Nigeria (Jibrin *et al*., 2014; Ide and Babatunde, 2015) and in Ghana (Samuel *et al*., 2014). This result might be due to a risky behavior common among females such as ear or nose piercing, indiscriminate use of eye lashes, or other direct contact with mucous membranes of eyes, mouth, or skin for cosmetic reasons.

The present study showed that the highest prevalence of HBsAg for HBV infection(39.4%) was seen in the age group of 12–22 years old, but no significant association was found (p>0.05). This result was in agreement with those studies performed in Nigeria (Jibrin *et al*, 2014).

The present study showed no statistical significant association between HBsAg infection and age of the studied patients (p>0.05). This result was in disagreement with that study conducted in Syrian multitransfused patients (Widad *et al*., 2016).

Interestingly, this study has been shown that there was no significant association between the HBV infection and blood transfusion (p>0.05). This result agreed with previous study carried out in Ghana ((Samuel *et al*., 2014). In contrast, various studies have shown that blood transfusion was a predictor for the development of HBV infection and increased rates of HBV infection among SCAPs were recorded (Ghalib, 2014; Widad *et al*., 2016). This may be due to the small sample size of this study, different setting and different in markers screening of HBV infection.

In this study, no significant associations were found between studied risk factors (blood transfusion, surgical operations, dental visiting and injury) and HBV infection among SCAPs (p> 0.05). These results agreed with those studies performed in Nigeria (Jibrin *et al*, 2014), in Ghana (Samuel *et al*., 2014) and in India, (Vinod *et al*., 2015). In contrast to our finding, a study conducted in Sana'a city showed a significant association of HBV infection with some risk factors including blood transfusion, surgical operations and family history (Ghalib, 2014). Also, previous studies reported in King Salman Armed Forces Hospital, Kingdom of Saudi Arabia (Muhammad *et al*., 2015) and in Syrian multitransfused patients where the HBsAg and/or anti-HBc seropositivity was significantly associated with the number of blood transfusions (p = 0.03), but not associated with the number of blood units (p>0.05) (Widad *et al*., 2016).

The lack of significant association between various risk factors and HBsAg seropositivity in this study may reflect the absence or low level of awareness of these various risks factors and HBV infection among rural families.

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