International Journal of Pharmacological Research
ISSN: 2277-3312 (Online)
Journal DOI: https://doi.org/10.7439/ijpr **Research Article**

Onset prevalence of hepatitis B Virus among patients receiving multiple blood transfusions in Khartoum

Rania Abdalhamed Osman*[1] and Musa Abdalla Ali[2]

[1]*Faculty of Medical Laboratory Sciences, Department of Microbiology, University of Alneelain, Khartoum, Sudan*
[2]*Faculty of Medical laboratory Sciences, Department of Microbiology, University of Khartoum, Sudan*

Abstract

This study Aims to determine the prevalence of HBs Ag in patient with multiple blood transfusions. In cross sectional study This cross sectional study 90 case. The age less than 60 years with multiple transfusion, These study carried in Khartoum hospitals, Khartoum state from Sep. to Dec 2017, in the subjects serological test were done, ageless than 60 years. Detection of HBs Ag will be done by Elisa Kits. Results: A total number of 90 patients were screened during the study period. 55 (61.1%) were males and 35 (38.9%) were females. 11.1% of the patients were positive HBs Ag, HBV was more prevalent in age (> 18 years, 18-25 years). Among HBsAg positive patients: 6 (60%) were males and 4(40%) were females. Four patients (11.8%) were HBs Ag positive and leukemia disease, two patients (11.1%) were HBs Ag positive and Sickle cell anemia, one patient (16.7%) was HBs Ag positive and Diamond blackfananemia (DBA), Two patients were HBsAg positive and suffer from bleeding after surgical operation. One patients was HBsAg positive and HCV positive, Four out of 13 (30.8%) were HBs Ag positive and jaundice positive, Two (28.6%) were HBs Ag positive and have family history of HBV. HBV transfusion transmission from occult HBV infection carrying extremely low viral loads is related to plasma volume transfused and possibly prevented by anti-HBs. HBV blood safety could be further improved by either anti-HBc screening (indicates previous or ongoing infection with hepatitis B virus in an undefined time frame).

Keywords: Transfusions, transmission, anemia, Hepatitis, predominantly, fulminant.

***Correspondence Info:**
Rania Abdalhamed Osman
Faculty of Medical Laboratory Science,
Department of Clinical Chemistry,
University of Alneelain, Khartoum, Sudan

***Article History:**
Received: 28/12/2018
Revised: 08/01/2019
Accepted: 10/01/2019
DOI: https://doi.org/10.7439/ijpr.v9i1.5020

QR Code

How to cite: Osman R, Ali M. Prevalence of Hepatitis B Virus among Patients Receiving Multiple Blood Transfusions in Khartoum. *International Journal of Pharmacological Research* 2019; 09(01): e5020. Doi: 10.7439/ijpr.v09i1.5020 Available from: https://ssjournals.com/index.php/ijpr/article/view/5020

1. Introduction

Hepatitis is a Latin word which means inflammation of liver. At the present time viral hepatitis is a major health problem worldwide, particularly in Asian countries. Hepatitis is caused by different hepatic viruses and it leads to liver related morbidity.[1] Mostly hepatic infection is caused by single hepatic virus but sometime infection with multiple viruses may occur and it leads to different management problems. These different problems include higher incidence of morbidity and mortality [2]. Hepatitis B virus "HBV" it has a long incubation period "weeks to 6 month" and protracted illness with a variety of outcome. Hepatitis B virus "HBV" infection remains global nubile health problem, despite the availability of ineffective vaccine. [3,4] Hepatitis B virus (HBV) is a double stranded DNA virus belonging the family of hepanda virida and is the only member that infects humans. The hepatitis B virus contain a core protein "HBcAg" as well as surface coat protein (HBsAg) is a protein that produced by the virus in the secretary process but the function of the protein is not well understood. [5] "HBV" in a worldwide in infection. Approximately 5% of world's population have chronic "HBV" infection. WHO has defined the following classification hepatitis B endemicity. [6]

The predominant mode of transmission of "HBV" varies in different geographical areas perinatal infection is the prevalence areas.[7,8] In comparison, to horizontal transmission, particularly in early childhood account for most cases of chronic (HBV) infection in intermitted prevalence areas while unprotected. Sexual intercourse and

intravenous drug use in adult are the major routes in low prevalence areas. [9] The infection rate among infants born "HBeAg" positive is a high as 90%. Maternal – infant transmission may occur in utro at the time of birth or after birth. The high protective "95%" of neonatal vaccination suggests that most infection occur predominantly at or before birth.[10] There is no evidence that cesarean section should not be routinely recommended for carrier mothers. Breast feeding does not appear to increase the risk of transmission. [8]

Children may acquire HVB infection through horizontal transmission minor breaks in the skin or mucous membranes or close bodily contact with other children in addition HBV can survive about side than human body for a prolonged period, as a result transmission via contaminated household articles such as tooth brushes razors and even toys may be possible. The incidence of transfusion – related B decreased significantly after the exclusion of paid blood donors"9" and the introduction of hepatitis B surface antigen "HBs Ag" screening of donors. Despite adequate screening HBV transmission is still the most frequent transfusion – transmitted viral infection. [11]

Sexual transmission remains the major mode of spread of HBV in developed countries sexual transmission of hepatitis B can prevented by vaccination and safe sex practice use of condoms.[12,13]

Percutaneous transmission happens among intravenous drug users who share syringe and needles.[14] HBV is the most common transmitted borne in the health care settling transmission generally occurs from patient to patient or from patient to health care personnel via contaminated instruments to accidental needle sticks. HEALTH Care workers particularly surgeons, pathologists and physicians in hemodialysis and oncology units have the highest risk of HBV infection.[15,16]

Transmission of HBV infection has been reported after transplantation of extra hepatic organs such as kidney and even cornea from "HBsAg" positive donors[17] Manifestations range from sub clinical or anicteric hepatitis "Approximately 70% of patients "icteric hepatitis and, in some cases fulminant hepatitis fulminant hepatic failure is unusual occurring, in approximately 0.1% to 0.5% of patients. Fulminant hepatitis B is believed to be due to massive immune mediated lysis of infected hepatocytes, this explains why many patients with fulminant hepatitis B have no evidence of HBV replication at presentation.[18]

Many patients with chronic hepatitis B are a symptomatic, while others have no specific symptoms such as fatigue chronic HBV infection is occasionally associated with extra hepatic manifestations including polyarteritisnodosa and glomerulonephropathy.[19]

2. Material and method

2.1. Study Area:

The study is conduct at Khartoum Hospitals.

2.2. Study design:

This cross sectional study was done on 90 cases on the age less than 60 years; with multiple transfusions, (Transfusion more than 3 times). This study carried in Khartoum hospitals, Khartoum state from Sep. to Dec 2017, in the subjects serological test were done.

2.3. Study period:

Data was collected from Sep. to Dec 2017

2.4. Study population:

Patients with multiple blood transfusion, ageless than 60 years, 90 patients enroll in the study sample size

2.5. Inclusion criteria:

- Patient age less than 60 years, with multiple transfusions, (Transfusion more than 3 times).
- Those who agree to participate in the study.

2.6. Exclusion criteria:

- Patient transfusion less than 3 times.
- Age more than 60 years.
- Patents are not agreed to participate in the study.
- Very ill patient.

2.7. Ethical considerations:

Ethical Obtained from research ethical committee of faculty of graduate studies Al-Neelain University and ministry of health Khartoum state. Verbal consent is obtained from patient questionnaire interview and blood test sampling.

2.8. Experimental work:

Specimen collection and storage blood samples are takes by normal vein puncture technique 3ml were put a plain container and allows to clot and then serum is separate at room temperature by centrifugation and kept frozen -20 for the purpose of HBs Ag. Detection of HBs Ag will be done by Elisa Kits.

2.9. Statistical analysis:

Data summarize and present by means of tables and Graphs. Statistical Package for Social Sciences "SPSS" is use to examine Existence of possible association between risk factors and diagnosis of HBV infection.

3. Results

Provision of constant and safe blood has been a public health challenge in Sub-Saharan Africa with high prevalence of transfusion-transmissible infections (TTIs). A total number of 90 patients were screened during the study period. Of these 55 (61.1%) were males and 35 (38.9%) were females. 11.1% of the patients were positive HBs Ag,

Table 1: Sero-prevalence of HBV according to age of the patients

Age		HBs Ag		Total
		+ve	-ve	
> 18 years	Count	4	66	70
	%	5.7%	94.3%	100.0%
18-25	Count	3	7	10
	%	30.0%	70.0%	100.0%
26-35	Count	1	3	4
	%	25.0%	75.0%	100.0%
36-45	Count	0	2	2
	%	0.0%	100.0%	100.0%
46-60	Count	2	1	3
	%	66.7%	33.3%	100.0%
Total	Count	10	79	89
	%	11.2%	88.8%	100.0%
P –Value	p <0.001			

Overall, the seroprevalence of HBV was 11.1%. HBV was more prevalent in age (> 18 years, 18-25 years) see (Table 1). Prevalence of HBV with respect age was statistically significant p< 0.001

Table 2: Sero-prevalence of HBV according to gender of the patients

HBs Ag		Gender		
		M	F	Total
Positive	Count	6	4	10
	%	60.0%	40.0%	100.0%
Negative	Count	49	31	80
	%	61.3%	38.8%	100.0%
Total	Count	55	35	90
	%	61.1%	38.9%	100.0%
P-vale		0.939		

Among HBsAg positive patients: 6 (60%) were males and 4(40%) were females. Also the HBsAg negative were 49 (61.3%) and 31(38.8%) in male and female respectively. The total samples were 55(61.1%) male and 35(38.9%) female. Which show insignificant deference between male, female P-value = 0.939.

Table 3: Sero-prevalence of HBV according to diagnosis of the patients

Diseases		HBs Ag		
		+ve	-ve	
Prostate Cancer	Count	0	5	5
	%	0.0%	100.0%	100.0%
Leukemia	Count	4	30	34
	%	11.8%	88.2%	100.0%
Sickle cell anemia	Count	2	16	18
	%	11.1%	88.9%	100.0%
Diamond blackfan anemia (DBA)	Count	1	5	6
	%	16.7%	83.3%	100.0%
Bleeding	Count	2	20	21
	%	9.1%	90.9%	100.0%
Head tumor	Count	0	1	1
	%	0.0%	100.0%	100.0%
H.pylori	Count	0	1	1
	%	0.0%	100.0%	100.0%
Renal failure	Count	0	1	1
	%	0.0%	100.0%	100.0%
Lung cancer	Count	0	1	1
	%	0.0%	100.0%	100.0%
HCV	Count	1	0	1
	%	100.0%	0.0%	100.0%
Total	Count	10	80	90
	% s	11.1%	88.9%	100.0%

Four patients (11.8%) were HBs Ag positive and leukemia disease, two patients (11.1%) were HBs Ag positive and Sickle cell anaemia, one patient (16.7%) was HBs Ag positive and Diamond blackfananemia (DBA), two patients HBsAg positive and suffers from bleeding after surgical operation. One patient was HBsAg positive and HCV positive. Five patients (100%) were HBs Ag negative and prostatic cancer, one patients was HBsAg negative and suffer from head tumor, one patients was HBs Ag negative and suffer from *H.pylori*. one patients was HBsAg negative and suffer from renal failure, one patients was HBsAg negative and suffer from lung cancer.

Table 4: Sero-prevalence of HBV according to diagnosis of the jaundice

Jaundice		HBs Ag		Total
		+ve	-ve	
YES	Count	4	9	13
	%	30.8%	69.2%	100.0%
NO	Count	6	71	77
	%	7.8%	92.2%	100.0%
Total	Count	10	80	90
	%	11.1%	88.9%	100.0%

Four out of 13 (30.8%) were HBs Ag positive and jaundice positive, 6 (7.8%) were HBsAg positive and jaundice negative.

Table 5: Sero-prevalence of HBV according to History of traditional practices

History of traditional practices		HBs Ag		Total
		+ve	-ve	
YES	Count	0	1	1
	% within Q5	0.0%	100.0%	100.0%
NO	Count	10	79	89
	% within Q5	11.2%	88.8%	100.0%
Total	Count	10	80	90
	% within Q5	11.1%	88.9%	100.0%

Ten (11.2%) were HBs Ag positive and no history of traditional practices, 79 (88.8%) were HBs Ag negative and no history of traditional practices. One (100%) which was HBs Ag negative and have history of traditional practices.

Table 6: Sero-prevalence of HBV according to Family history of HBV

Family history of HBV		HBs Ag		Total
		+ve	-ve	
YES	Count	2	5	7
	% within Q6	28.6%	71.4%	100.0%
NO	Count	8	75	83
	% within Q6	9.6%	90.4%	100.0%
Total	Count	10	80	90
	% within Q6	11.1%	88.9%	100.0%

Two (28.6%) were HBs Ag positive and have family history of HBV, 8 (9.6%) were HBs Ag positive and haven't family history of HBV. Five (71.4%) were HBs Ag negative and have family history of HBV.

Table 7: Sero-prevalence of HBV according to History of contact with HBV

History of contact with HBV patients		HBs Ag		Total
		+ve	-ve	
Yes	Count	3	22	25
	% within Q7	12.0%	88.0%	100.0%
No	Count	7	58	65
	% within Q7	10.8%	89.2%	100.0%
Total	Count	10	80	90
	% within Q7	11.1%	88.9%	100.0%

Three (12.0%) were HBs Ag positive and History of contact with HBV patients, 7 (10.8%) were HBs Ag positive and haven't History of contact with HBV patients. 22 (88%) were HBs Ag negative and have History of contact with HBV patients.

Table 8: Sero-prevalence of HBV according to HBV vaccination status

		HBs Ag		Total
		+ve	-ve	
Vaccinated	Count	0	13	13
	%	0.0%	100.0%	100.0%
Not vaccinated	Count	10	52	62
	%	16.1%	83.9%	100.0%
Unknown	Count	0	14	14
	%	0.0%	100.0%	100.0%
Double dose vaccinate	Count	0	1	1
	%	0.0%	100.0%	100.0%
Total	Count	10	80	90
	%	11.1%	88.9%	100.0%

Ten (16.1%) were HBs Ag positive and not vaccinated, 13 (100%) were HBs Ag negative and vaccinated. no patients were vaccinate and HBs Ag positive. 14 (100%) were HBs Ag negative and not unknown with HBV vaccine. One (100%) was HBsAg negative and have Double dose vaccinate.

Table 9: Sero-prevalence of HBV according to number of blood transfusion

Number of blood transfusion		HBs Ag		Total
		+ve	-ve	
3-10	Count	4	54	58
	% within number	6.9%	93.1%	100.0%
11-20	Count	4	16	20
	% within number	20.0%	80.0%	100.0%
21-30	Count	1	7	8
	% within number	12.5%	87.5%	100.0%
31-40	Count	1	3	4
	% within number	25.0%	75.0%	100.0%
Total	Count	10	80	90
	% within number	11.1%	88.9%	100.0%

Four (6.9%) of patient were HBs Ag positive and transfusion blood between 3-10, four (20%) were HBs Ag positive and transfusion blood between 11-20. one patients were HBs Ag positive and transfusion blood between 21-30. One patient was HBs Ag positive and transfusion blood between 31 and 40.

4. Discussion

These result similar to Shepard 2005 which report More than one third of the population has been infected with HBV and it is estimated that there are 80 million HBV carriers (about 6% of the total population)[20]. It is generally accepted that the diagnosis of infection by HBV is based on the presence of the HBsAg in the blood stream [21]. However, screening of blood bank donors for HBsAg does not totally eliminate the risk of HBV infection through blood transfusion [22] and these results similar to Park 2009 which report that Around 10 -15% of HBV infected persons are chronic carriers and 50% of the infectious HCV infected cases are asymptomatic. [23] The blood transfusion is an effective mode of transmission of both HBV, as it allows large quantum of infective virions into the recipient. Pre-donation clinical screening of donors to reject or defer the risky group from donation is an important step. But many of the donors are not detected during pre-donation clinical screening by blood bank officer especially. If we compare the HBsAg positivity in other developing countries of the world the rate is quite high as compared to India. Table 10 shows prevalence of HBsAg in other countries. [24]

5. Conclusion

We conclude that multi-transfusion hepatitis B continues to be the most common cause of blood transfusion in Sudan. HBV infection by blood components is currently prevented in most developed countries by combining sensitive HBV surface antigen (HBsAg) assays, HBV transfusion transmission from occult HBV infection carrying extremely low viral loads is related to plasma volume transfused and possibly prevented by anti-HBs. HBV blood safety could be further improved by either anti-HBc screening (indicates previous or ongoing infection with hepatitis B virus in an undefined time frame).

References

[1]. Gaeta GB, Rapicetta M, Sardaro C, Spadaro A, Chionne F, Freni AM. Prevalence of anti-HCV antibodies in patients with chronic liver disease and its relationship to HBV and HDV infections. *Infection.* 1990; 18:277–9.doi: 10.1007/BF01647003.

[2]. Tsatsralt-Od B, Takahashi M, Nishizawa T, Endo K, Inoue J, Okamoto H. High prevalence of dual or triple infection of hepatitis B, C, and delta viruses among patients with chronic liver disease in Mongolia. *J Med Virol.* 2005; 77:491–9. doi: 10.1002/jmv.20482.

[3]. Parkj E, Park. Hepatitis B virus infection in: Park J, Park M eds. Text book of preventive and social Medicine 15th edn Philadelphia; W.B. Saunders: 1996.p.145-47.

[4]. Stephen B. James W. Hepatitis B virus in I daneilp, Abba I. T. Tristram G, eds. Basic and clinical

immunology 8th edn. North walk san Maleocaifornia: Appeleton and log: 1992: P464-72.

[5]. Chisari FV, Ferrari: Hepatitis B virus immune-pathogenesis. *Annu Rev Immunoi* 1995; 13: 29-60.

[6]. Alter H J, Hougthon M. Hepatitis C virus and elimination post transfusion hepatitis. *Natmed* 2006; (10): 1082-1086.

[7]. Wrightt L, Mamish D, Combs, *et al*. Hepatitis B virus and apparent fulminant non – A, non–B hepatitis. *Lancet* 1992; 339: 952.

[8]. Alter M J, Hadlers C, Morgolis H *et al*. The changing epidemiology of hepatitis B in the United States. Need for alternative vaccination strategies. *JAMA* 1990; 263:12-18.

[9]. Stephen B, James W. Hepatitis B virus in daneil p, Abbol, Terr. T, Tristrangeds. Basic and clinical immunology 98th edn North walk san Maleocaifornia: *Appeleton and long*: 1992: 464-72.

[10]. Philib A, Brunell A, hepatitis B infed in: Beharnan RE, Kliegman RM, Nelson WE, Vaughan V C, eds. Nelsont Text book of paediatrics 14th edn. Philadelphia: Saunders 1992: 819 -22.

[11]. Gohkt. Prevention and control & hepatitis B virus infection in Signgapore. *Ann Acadmed Singapore* 1997: 26: 671.

[12]. Thompson N D, Per Z JF, Moor Man AC, Holmberg SD. Non hospital health care. Associated hepatitis B and C virus transmission: United States 1998 -2008. *Ann Intern Med* 2009; 150: 33.

[13]. Gerberdingj L. The infection health care provider. *N Engi J Med* 1996; 334: 594.

[14]. Dickson RC, Everhart JE, Lake JR, *et al*. Transmission of hepatitis B by Transplantation of liver from donors positive for antibody to hepatitis B core antigen. *Gastroenterology* 1997; 113: 1668.

[15]. Wright L, Mamish D, Combs C, *et al*. Hepatitis B virus and apparent fulminant non. A, non – B hepatitis. *Lancet* 192: 339: 952.

[16]. Beasley RP, H Wang LY, Linc C, *et al*. Incidence & hepatitis B virus infection in preschool children in Taiwan. *J Infection D*: S 1982; 146: 18.

[17]. Coursaget P, Y Vonnet B, Chotard J, *et al*. Age and sex–related study of hepatitis B virus chronic carrier state in infants from endemic area (Senegal). *J Med Virol* 1987; 22:1.

[18]. Haber BA, Block J m, Jonas MM, *et al.* Recommendations for screening, monitoring and referral of pediatric chronic hepatitis B. *Pediatrics* 2009; 124: e1007.

[19]. Krugmans, over by LR Mushahwari K, *et al*. Viral hepatitis type B studies on Natural history and prevention re-examined. *N Engl J Med*, 2000; 300:101.

[20]. Shepard CW, Finelli L, Alter MJ. Global epidemiology of Hepatitis C virus infection. *Lancet Infect. Dis.* 2005; 5: 558- 67.

[21]. Badur S, Akgun A. Diagnosis of hepatitis B infections and monitoring of treatment. *J Clin Virol* 2001; 21: 229-237.

[22]. Allain JP. Occult hepatitis B virus infection. *Transfus Clin Biol* 2004; 11: 18-25.

[23]. Park K. Textbook of, preventive and social medicine. 20th ed. Jabalpur, India: *Bhanot*; 2009: 184- 94.

[24]. Lt Col PK Gupta, Col H Kumar, Mr DR Basannar, Brig M Jaiprakash. Transfusion Transmitted Infections in Armed Forces: Prevalence and Trends: *MJAFI*; 2006; 62: 348–350.

[25]. Okoroiwu, H. U., Okafor, I. M., Asemota, E. A., Okpokam, D. C. Seroprevalence of transfusion-transmissible infections (HBV, HCV, syphilis and HIV) among prospective blood donors in a tertiary health care facility in Calabar, Nigeria; an eleven years evaluation, *BMC Public Health*, 2018; 18(1): 645.