TAJ June 2009; Volume 22 Number 1

ISSN 1019-8555
The Journal of
Teachers Association
RMC, Rajshahi

Original Article

Vertical Transmission of Hepatitis B Virus is the most Important Route of Transmission in Asymptomatic Carriers in Bangladesh

Harun-or-Rashid[1], Abdul Alim[2], A R M Saifuddin Ekram[3], Iftekhar Mahmood[4], M Mahfuzul Hoque[5], K Rahman[5], M M Rahman Khan[5], Belal Uddin[6], Mobin Khan[7]

Abstract

To find out the route of the transmission of HBV in asymptomatic carrier and build up awareness against the transmission of HBV.

It was a prospective study in the Dept. of Medicine (IPD & OPD) and Transfusion Medicine in Rajshahi Medical College Hospital from June 2005 to July 2007. 300 asymptomatic carriers of HBV were included. HBsAg was detected incidentally during routine screening tests done for blood donation programme, foreign mission and courses abroad. All the HBsAg positive patients were confirmed by doing HBsAg (ELISA) tests after 6 months. All were positive.

Among 300 asymptomatic carriers male 270 and female 30. Age between 15 to 35 yrs. HBeAg positive only in 15 patients. ALT above 60 U/L in 17 patients, HBV-DNA (PCR) detectable in 15 patients, coarse liver echotexture in 20 patients, Oesophageal Varix small size in 02 patients. Serum Albumin, PT, AFP all were normal range. Screening of all the family members of the carriers was done. Among the 300 index cases 130 (43.33%) family members most likely mother,father, brother, sister or cousin were HBVmarkers positive. Liver related death was present in 50 families (16.66%}

HBV transmission is preventable. Mass education is required about the transmission of HBV. Screening of HBV should be mandatory in all pregnant women. Bangladesh Government has integrated the HBV vaccination in EPI.

TAJ 2009; 22(1): 97-100

Introduction

Hepatitis B virus (HBV) is a major public health problem and cause of infectious disease mortality world wide. Approximately 2 billion people one third of the world's population have serologic evidence of past or present HBV infection and 350 million people are chronically infected. HBV is transmitted by percutaneous and mucous membrane exposures to infectious blood and body fluids that contain blood. percutaneous exposures that have resulted in HBV transmission include transfusion of blood or blood products [1, 2] injection and other heath care related procedures [3-7], illegal injection drug use [8], and needle sticks or

[1] Assistant Professor, Department of Hepatology, Rajshahi Medical College, Rajshahi.
[2] Associate Professor, Department of Gastroenterology, Rajshahi Medical College Rajshahi.
[3] Professor, Department of Medicine Rajshahi Medical College Rajshahi.
[4] Associate Professor, Department of Medicine Rajshahi Medical College Rajshahi.
[5] Assistant Professor, Department of Medicine Rajshahi Medical College Rajshahi.
[6] Assistant Professor, Department of Paediatric Rajshahi Medical College Rajshahi.
[7] Professor, BSM Medical University, Dhaka.

other injuries from sharp instruments sustained by hospital personnel [9,10]. In addition, occasional out breaks of hepatitis B have been associated with tattooing and acupuncture [11,12]. Because HBV is stable on environmental surfaces for ≥ 7 days [13], indirect inoculation of HBV can also occur via inanimate objects. Perinatal and sexual transmission of HBV usually results from mucous membrane exposures to infectious blood or serum derived body fluids [14,15]. The risk of perinatal HBV transmission has been well described. The risk is greatest for infants born to women who are HBeAg- positive and ranges from 70-90% at 6 months of age; about 90% of these children remain chronically infected [15]. The risk of perinatal infection among infants born to HBeAg- negative mothers ranges from 10 to 40%, with 40- 70% of these infected infants remaining chronically infected [15, 16]. Children born to HBsAg positive mothers who do not become infected during perinatal period remain at high risk of infection during early childhood [17-19]. In one study 40% of infants born to HBeAg negative mothers became infected by 5 years of age [16].

Material and Methods

Three hundred consecutive HBsAg carriers were included. All of them were asymptomatic. They were detected to have positive HBsAg incidentally during routine screening tests for going abroad & blood donation programme. All the patients were observed for more than 6 months after detection of HBsAg. All the HBsAg positive patients were confirmed by doing HBsAg (ELISA) tests after 6 months. All were positive. Detail history and clinical examination were done at the entry. Hepatitis B viral profile, Serum alanine aminotransferase (ALT), prothrombin time (PT), albumin, alpha-fetoprotein (AFP) were done in all cases at the entry. Ultrasonography and UGI Endoscopy was done in all cases. All clinical & laboratory data were recorded in a questionnaire and checklist and then analyzed in a computer. Statistical significance of data was determined by using x^2- test (Chi-squared test). All results were expressed as mean or percentage where indicated.

Results

Age of the patients range from 15 to 35 yrs (25± 10). Two hundred and seventy (90%) cases were male and thirty (10%) cases were female. Five patients had previous history of Jaundice (1.66%), 20 patients had history of injections (6.66%), history of hospital admission was in 12 (4%), Blood transfusion history had 5 patients (1.66%). History of sexual promiscuity was present in 15 patients (5%), 12 (4%) patients were health care workers of which 5 (1.66%) were nurses. History of major and minor surgery was present in 10 patients (3.33%). No hepatomegaly found in any cases, splenomegaly in 3 (1%) cases, esophageal varices small size in 2 cases (.66%), spider angioma, gynaecomastia, palmer erythema, testicular atrophy and ascites were not found in any of the cases. ALT above 60 u/l in 17 patients (5.66%) HBV-DNA (PCR) detectable in 15 patients (5%), coarse liver echotexure in 20 patients (6.66%) serum albumin, prothrombin time, Alpha-fetoprotein all were normal range. Screening of the family members of all carriers was done. Among the 300 index cases 130 family members (43.33%) most likely mother, father, brother, sister or cousin were HBsAg, Anti HBs, Anti HBc (total) were positive. Liver related death was present in 50 familes (16.66%).

Table I: Base line characteristics of HBV carriers (N= 300)

Characteristics	Number	Percentage
Age (in years) 15- 35yrs		
(25 ± 10) (mean ± SD)		
Sex		
Male	270	90%
Female	30	10%
Previous history of Jaundice	5	1.66%
Previous history of Injections	20	6.66%
Previous history of Blood transfusion	5	1.66 %
Previous history of Hospital Admission	12	4.00 %
Previous history of sexual prosmiscuity	15	5.00%
Previous history of Surgery	10	3.33%
Previous history of contact with Jaundiced Patients	10	3.33%

Health care workers	12	4.00%
Affected family members of index cases	130	43.33%
History of Liver related death in the affected family	50	16.66%
Asymptomatic	300	100.00%
Hepatomegaly	Nil	0%
Splenomegaly	03	1.00%
Oesophageal Varix	02	.66%
Spider angioma, Gynaecomastia		
Palmererythema	Nil	0%
Testicular atrophy		
Ascites		

Table II: Serological, Biochemical, USG and Endoscopic charactistic of asymptomatic HBV carriers (N= 300)

Characteristics		Number	Percentage
HBsAg- positive		300	100.00 %
HBeAg- positive		15	5.00%
HBV-DNA positive (PCR)		15	5.00%
ALT (above 60 u/l)		17	5.66%
Serum Albumin			
prothrombin time		300	100.00 %
Alpha-fetoprotein	Normal		
Coarse liver echotexure		20	6.66%
Oesophageal varix (small size)		02	.66%

Table III: Occupations of HBV carriers (N= 300)

Occupation	Number	Male	Female	Percentage
Students	130	120	10	43.33%
Farmer	70	70		23.33%
Businesman	49	49		16.33%
Service holder	37	31	06	12.33%
House wife	14		14	4.00%

Table IV: Positive HBV- markers in family members (n= 130)

Characteristics	Number	Relation	Percentage
HBsAg- positive	55	Mother	
	10	Father	61.53%
	15	others- Brother, Sister, Cousin	
Anti HBs	35	Mother	
	6	Father	31.53%
Anti HBc(T)	8	Mother	
	1	Father	6.92 %

Discussion

Perinatal transmission results in increase number of HBV carriers. In our study all of the cases were asymptomatic carriers. Most of them were young and active force in our society. The most important fact regarding HBV infection is that there are many asymptomatic cases who will possibly develop liver cirrhosis and hepatocellular carcinoma themselves in later life and who also become a source of HBV infection to other people. The time of development of chronic HBV infection related to infancy and infection during later childhood or adulthood usually results in acute or sub- clinical disease without chronicity except that patients are in an immune compromised condition. Thus HBV infection of adults through sexual contact or drug abuse sometimes causes acute or fulminant hepatitis but not chronic hepatitis or the asymptomatic state.

In our study the perinatal transmission rate is 43.33%. This kind of study was done in India[20], Pakistan[21], Japan[22], Iran[23]. They all show that perinatal transmission is the important route of HBV transmission. Their studies were mostly on paediatric age group. But our study was adolescent and adult age group. It is obvious that majority of infection occurs in children and hence the majority of chronic carricrs in our population result from vertical transmission. In order to decrease the significant morbidity and mortality in later life associated with HBV infection, Children are the most important group to intervene.

As vertical infection is responsible for majority of infections it may sufficient to screen all pregnant women and immunize high risk infants. High risk strategy involves screening all the pregnant females for HBsAg and immunizing infants of only those mothers who are positive for it. There fore keeping in mind that vertical transmission is the most important mode of infection of HBV in children, it is inferred that hepatitis B immunization should begin at birth to have a greater impact. Bangladesh Govt. has already integrated HBV vaccination in EPI.

References

1. Alter HJ, Purcell RH, Holland PV, Morrow AG, Purcell RH, Feinstone SM, et al. Clinical and serological analysis of transfusion-associated hepatitis. Lancet 1975; 2:838-41.
2. Seeff LB, Wright EC, Zimmerman HJ, McCollum RW. VA cooperative study of post-transfusion hepatitis,1969-1974:incidence and characteristics of hepatitis and responsible risk factor. Am J Med Sci 1975;270:355-62.
3. Hutin YJ, Harpaz R, Drobeniuc J, Melnic A, Ray C, FavorovM, et al. Injections given in healthcare settings as a major source of acute hepatitis B in Moldova. Int J Epidemiol 1999;28:782-6.
4. Alter MJ, Ahtone J. Maynard JE/ Multiple-dose vial associated with transmission of hepatitis B virus in hemodialysis unit. An Intern Med 1983;99:330-3.
5. Polsh LB, Shapiro CN, Bauer F, Klotz P, Ginier P, Roberto RR, et al. Nosocomial transmission of hepatitis B virus associated with a spring-loaded fingerstick device. N Engl J Med 1992;326:7215.
6. Hutin YJ, Goldstein ST, Varma JK, O'Dair JB, Mast EE, Shapiro CN, et al. An outbreak of hospital-acquired hepatitis B virus infection among patients receiving chronic hemodialysis. Infect Control Hosp Epidemiol 1999; 20:731-5.
7. Drescher J. Wagner D, Haverich A, Flik J, Stachan-Sunstyr R, Verhagen W, et al. Nosocomial hepatitis B virus infection in cardiac transplant recipients transmitted during transgvenous endomyocardial biopsy, J Hosp Infect 1994;26:81-92.
8. Lettau LA, MeCarthy JG, Smith MH, Hadler SC, Morse LJ, Ukena T, et al. An outbreak of severe hepatitis due to delta and hepatitis B viruses in parenteral drug abusers and their contacts. N Engl J med 1987;317:1256-61.
9. Alter HJ, Seeff LB, Kaplan PM, McAuliffe VJ, Wright EC, Gerin JL, et al. Type B hepatitis: the infectivity of blood positive for a antigen and DNA polymerase after accidental accidental needlestick exposure. N Engl J Med 1976; 295:909-13.
10. Mast EE, Alter MJ. Prevention of hepatitis B virus infection among health care workers, In: Ellis RS, editor. Hepatitis B vaccines in clinical practice. New York: Marcel Dekker; 1992. p.295-307.
11. Limentani AE, Elliott LM. An outbreak of hepatitis B from tattooing. Lancet 1979;2:86-8.
12. Kent GB, Brondum J, Keenlyside RA, LaFazia LM, Scott HD. A large outbreak of acupuncture-associated hepatitis B. Am J Epidemiol 1988;127:591-8.
13. Bond WW. Favero MS, Petersen NJ, Gravelle CR, Ebert JW, Maynard JE. Survival of hepatitis B virus after drying and storage for I week. Lancet 1981;1:550-1.
14. Alter MJ, Margolis HS. The emergence of hepatitis B as a sexully transmitted disease. Med Clin N Am 1990;74:1529-41.
15. Stevens CE, Neurth RA, Beasley RP, Szmuness W. HBeAg and anti- HBe detection by radioimmunoassay. Correlation with vertical transmission of hepatitis B virus in Taiwan. J Med Virol 1979;3:237-41.
16. Xu ZY, Liu CB, Francis DP, Purcell RH, Gun ZL, Duan SC, et al. Prevention of perinatal acquisition of a randomized double-blind placebo-controlled and comparative trial. Pediatrics 1985;76:713-8.
17. Beasley RP, Hwang L-Y. Postnatal infectivity of hepatitis B surface antigen-carrier mother. J Infect Dis 1983;147:185-90.
18. Franks AL, Berg CJ, Kane MA, Browne BB, Sikes RK, Elsea WR, et al. Hepatitis B infection among children born in the United States to southeast Asian refugees. New Engl J Med 1989;321:1301-5.
19. Huric MB, Mast EE, Davis JP. Horizontal transmission of hepatitis B virus infection to United States-born children of among refugees. Pediatrics 1992;89:269-73.
20. Chakravarti A, rawat D, Jain M. A Study on the Perinatal Transmission of the Hepatitis B Virus . Indian J med. Microbiol. 2005;23:128-30.
21. Khalida Kazmi, A. Ghafoor, A. Waheed Qureshi. Mother-infant transmission of hepatitis B in Pakistan. Pakistan J. Med. Res. 2003;42(4):181-2.
22. Kazuo Shiraki. Perinatal transmission of hepatitis B virus and its prevention. J. of Gastro & Hep, 2000;5:E_{11}- E_{15}.
23. Mohammad Reza Hasanjani Roushan MD, Minoo Mohraz MD, Ali Akbar velayati MD. Possible transmission of hepatitis B virus between spouses and their children in Babol, Northern Iran. Tropical Doctor 2007;37:245-247.

All correspondence to:
Harun-or-Rashid
Assistant Professor
Department of Hepatology
Rajshahi Medical College, Rajshahi.