

Epidemiological Study on Prevalence of HBsAg in Malarial Patients

**Sharifi-Mood B. MD, **Sanei- Moghaddam S. PhD, * Metanat M. MD*

**Research Center for Infectious Diseases and Tropical Medicine, Boo-Ali Hospital, Zahedan University of Medical Sciences, Iran*

*** Research Center of Zahedan Blood Transfusion Organization, Zahedan, Iran*

(First received 26 Jan 2005; accepted in revised form 7 Jul 2005)

Abstract

Background: Hepatitis B is the most common cause of acute viral hepatitis in the world. A small number of epidemiological studies, show the role of sucking insects in the transmission of hepatitis B as mechanical vector. In order to determine the prevalence of HBsAg in patients with malaria and to compare with healthy blood donors, this study was conducted.

Methods: In this case-control study, 150 malarial patients were observed in Zahedan, Southeast Iran in 2000-2001. All patients were selected randomly from 10 health centers in four areas of Zahedan. Control group (150 blood donors), also were selected randomly using random number table. After recording the demographic data, 5 ml of blood was drawn from each case and were evaluated by ELISA method (Sorin biomedical kit) for HBsAg.

Results: The prevalence of HBsAg was higher in malarial patients than blood donors and there was a significant difference in the prevalence of HBsAg between two groups ($P= 0.049$). In addition, there was a significant difference between the prevalence of HBsAg and sex in malarial patients ($P= 0.04$).

Conclusion: The anopheles mosquito may transmit the virus from person to person as mechanical vector during feeding.

Keywords: *HBsAg, prevalence, malaria, blood donor, Iran*

Introduction

Hepatitis B is the most common cause of acute hepatitis in adults. A large number of cases are seen in Eastern Asia and Africa (1, 2). The prevalence of hepatitis B carriers varies in different parts of the world, ranging from less than 1% to 20 % (2, 3). In the Middle East, the endemicity is intermittent, with a carrier rate of 2% to 7% (3, 4). It is estimated that 3% of Iran population have chronic infection (4). Transmission of the hepatitis B is mainly parental and is related to using of share syringe in the IV drug users, sexual contact, and having different

partners (3). A small number of seroepidemiological studies demonstrating that occupational transmission occurs, but a very small number demonstrate the role of mosquito and other sucking insects in the transmission of hepatitis B as mechanical vector (3-6).

Since the hepatitis B and malaria infection are endemic in Zahedan, Sistan and Baloochestan Province, we decided to determine the prevalence of HBsAg in patients with malaria and to compare with results in control group.

Materials and methods

In this cross-sectional and case-control study from November 2000 to Feb 2001, 150 patients

Correspondence: Batool Sharifi-Mood, Tel: +98 541 322-9811, Fax: +98 541 3229197, E-mail: batoolsharifi@yahoo.com

(114 male and 36 female) were selected randomly from 10 health centers in four areas of Zahedan who fitted the selection criteria. These criteria included no history of icterus, hepatitis, and vaccination against hepatitis B, no history of transfusion, surgery, tattooing, bloodletting, and using of IV drug. Blood donors also were selected randomly from donors who had no any risk factor for hepatitis B infection and history of vaccination.

After recording the demographic data, 5 ml of blood was drawn from each case. Sera were analyzed for HBsAg using a commercial enzyme-linked anti-HBc. (ELISA Test, Sorin Biomedica). X² and Mantel –hanzel, SPSS tests were used for comparison of categorical variables. Differences with $P < 0.05$ were considered significant.

Results

Among 150 patients with malaria, 22 cases (14 males, 8 females) were HBsAg positive. In the control group, from 150 donors (128 males and 22 females), 10 cases (7 males, 3 females) were HBsAg positive. In two groups, nobody had apparently any risk factors for occurring of hepatitis B infection. There was no sexual partner except spouses regarding married subjects. Singles denied any sexual partner.

The analysis of results showed a significant relation between occurring of malaria and prevalence of HBsAg and probability of detection of HBsAg in malarial patients was 2.22 more than that of blood donors ($P = 0.049$ OR = 2.22).

Prevalence of HBsAg was higher in men than women in malarial patients and there was a significant relation between the prevalence of HBsAg and sex ($P = 0.04$). In addition, there was a significant difference between the frequency of HBsAg and sex in two group ($P = 0.041$).

Discussion

Our results showed that probability of detection of HBsAg in patients with history of malaria

was more than that of the blood donors. Although, there is a very limited studies about the role of sucking insects as a mechanical vector in transmission of hepatitis B virus infection, but all these studies have showed that insects can transmit this infection from person to person (1,7-10). For example, Mzhang showed a relation between frequency of infection and having a history of malaria (8). Moreover another study in Senegal, confirmed the relation between prevalence of HBsAg and malarial infection (11). Netwkrik study showed that sucking insects can transmit hepatitis B virus from person to others and virus obtained from blood samples people who have been bitted by infected insects (9). Even in these cases as experimental models who, are bitted in vitro could obtain anti-HBs. In African study, pools of sucking insects collected from huts in northern, South Africa (an area with high rates of human HBV seropositivity) tested positive for hepatitis B surface antigen. In addition, HBsAg persists in these insects for at least 7.5 weeks after experimental feeding (12, 13). Although, to now, the possibility of transmission of HBV infection by sucking insects is controversial, but in our survey as other studies, there was a significant relation between prevalence of HBsAg and having a history of malaria.

Therefore, we conclude that anopheles mosquito can transmit the virus during feeding and biting from infected person to others. Upon our results, we offer to do more researches on relation of prevalence of HBsAg and malaria infection especially, where HBV and malaria are endemic. If with more studies, this relation could be confirmed, we can advise that prophylaxis for malaria is a route for prevention of hepatitis B virus infection.

Acknowledgments

We would like to thanks Zahedan Research Center for Infectious Diseases and Tropical Medicine and all members of Zahedan Health Center and laboratory staff in Zahedan Blood

Transfusion Organization who assisted us in this study.

References

1. Anonymous (2003). Bed bugs and disease transmission. CDC. Available from: www.google.com
2. Alavian SM. *Healthy Carriers*. 2nd ed. Timoorzadeh, Tehran, 2001: pp. 2-18.
3. Alavian SM. *Hepatitis B*. 2nd ed. Nooredanesh, Tehran, 2002: pp.4-16.
4. Alavian SM. *Guideline of management of the Liver diseases*. 1st ed. Nooredanesh, Tehran, 2002: pp.4-19.
5. Merat SH, Malekzadeh R, Rezvan H, et al. Hepatitis B in Iran. *Arch Iran Med*. 2003; **(4)**:192-201.
6. Sherlock S, Dooley J. *Diseases of the liver and biliary system*. 10th ed. Churchill Livingstone, Philadelphia, 2001: p. 277.
7. Bruton G J. Bedbugs in relation to transmission of human diseases. *Pub Health Rep*. 1983; **78(3)**:513-24.
8. Mzheng Y. An animal study on transmission of hepatitis B virus through mosquito insect. *Chin Med J*. 1995; **(1)**: 895.
9. Netwkrik M M , Simon JB. Rate of ingested HBsAg in blood sucking insects. *Gastroenterology*.1975; **40(6)**: 982-7.
10. Ogston CW, London WT. Excretion of hepatitis B surface antigen by bedbug. *Trans R Soc Trop Med Hyg*.1980; **74(5)**: 823-25.
11. Will S W. HBsAg in Mosquito collection in Senegal. *Am G trop Med hyg*.1976; **(1)**: 186.
12. Jupp PG, Mc Eligot SE. Transmission experiments with HBsAg and common bedbug. *S Afr Med J*. 1979; **56(3)**:54-57.
13. Jupp PG , Purcel RH, Philips JM ,et al. Attempts to transmit hepatitis B virus to chimpanzees by arthropods. *S Afr Med J*. 1991; **79(4)**:320-22.