

PREVALENCE OF AUSTRALIA ANTIGEN (HBsAg) IN SEXUALLY TRANSMITTED DISEASES

M. R. LENKA * ELA GHOSH † AND S. K. PANJA ‡

Abstract

30 male patients suffering from sexually transmitted diseases and attending the Dermatology out-patients department of the S. S. K. M. Hospital, Calcutta, were studied for detection of Australia antigen. Immunodiffusion and Counter immunoelectrophoresis were done. 20 per cent Australia antigen (HBsAg) positivity was obtained in the series.

Introduction

The discovery of an immunologically distinct antigen in the serum of an Australian aborigine by Blumberg¹ and the subsequent recognition of its close association with serum hepatitis and hepatitis B virus led to a series of important advances in the understanding of viral hepatitis and other associated diseases.

The prevalence of Australia antigen (more appropriately known as hepatitis B surface antigen, HBsAg) in liver diseases, leprosy and in the general population including blood donors has been widely investigated. Mirick and Shank² suggested that hepatitis B virus may spread by sexual contact. Further epidemiological evidence of the venereal spread of hepatitis B virus was obtained from

serological surveys of sexually promiscuous groups³⁻⁵. Krugman and Giles⁶ demonstrated that oral exposure was an important mode of transmission. Keeping this in view, an attempt was made to find out the prevalence of HBsAg in patients with sexually transmitted diseases.

Material and methods

Thirty male patients with sexually transmitted diseases, attending the Dermatology Out-patients Department of the S.S.K.M. Hospital were studied. They included 23 with syphilis and 7 with gonorrhoea.

Five ml blood was collected aseptically from each patient in sterile containers and was allowed to clot. The serum was separated after centrifugation and labelled and stored at - 20°C for the following tests :

- (1) Agar gel immunodiffusion.
- (2) Counter immunoelectrophoresis.

Agar gel immunodiffusion :

Hepatitis B surface antigen was looked for in all the sera by the two

* Senior Research Fellow

† Lecturer, Department of Pathology

‡ Head, Division of Dermatology
S.S.K.M. Hospital, Calcutta

Request for reprint :

Dr. S. K. Panja
117, Vivekananda Road
Calcutta-700006.

Received for publication on 8-7-1980

dimensional microoucherlony technique of agar gel diffusion as employed by Blumberg¹ and modified by Lenka and Ghosh⁷.

Counter immunoelectrophoresis

The procedure used was that of Lenka and Ghosh⁷ who modified the method of Pesenderfer et al. Barbitone buffer pH 7.6 and ionic strength 0.05, and 0.6% agarose (BDH) were used with sodium azide (0.01%) as preservative. Electrophoresis was conducted in Gelman electrophoretic chamber at a constant current of 10 milliamperes and 130 to 150 volts per slide for one and a half hours. After the electrophoretic run the readings were taken immediately and the slides were kept in a moist chamber at 4°C. Readings were taken again after twenty four hours.

Results

Of the thirty cases studied by the method of agar gel diffusion, 4 cases were HBsAg positive. The results are summarised in Table I. By counter immunoelectrophoresis six were found to be positive than the agar gel diffusion technique.

TABLE I

HBsAg detection in agar gel diffusion and counter immunoelectrophoresis

Types of cases	Number of cases studied	HBsAg positive cases (Agar gel diffusion)	HBsAg positive cases (Counter immunoelectrophoresis)
Syphilis	23	3	5 (21.7%)*
Gonorrhoea	7	1	1 (14.3%)

* Prevalence rate shown within brackets

The prevalence rate of HBsAg in syphilis cases was 21.73% and gonorrhoea cases 14.28% as shown in Table I.

Discussion

The prevalence of HBsAg has been studied by various workers in India and abroad. In our series, the antigen was detected in 20 per cent of patients with sexually transmitted diseases.

HBsAg was found in 21.73% of patients with syphilis. Vranckz⁹ observed 9% HBsAg positivity in syphilis patients. Fulford et al³ observed 2% HBsAg positivity in patients attending the Venereal Diseases Clinic. Adam et al¹⁰ reported 5% HBsAg positivity in the sexually promiscuous group of patients. However, in England and Wales, a history of sexual contact with a jaundiced person was obtained in only 5% of the 981 cases reported to the Public Health Laboratory Service, Epidemiological Research Laboratory during 1975. A direct study of the spouses of patients with acute hepatitis B infection, in the United States¹¹ showed that almost one third of those who were HBs negative developed hepatitis when their wives became jaundiced.

Healthcote and Sherlock¹² in London studied 67 patients with acute hepatitis and observed sexual or domestic contact with 27 cases (40%). They further added that 15 of the 43 men studied were either homosexual or heterosexual (34.9%).

Lim et al¹³ suggested that HBsAg can be found in both semen and saliva. In a detailed study of 200 men, evidence of such infection was probably related to practice of oral sex.

Szmunes et al¹⁴ stated that the involvement in anal intercourse with large number of partners played a major role in the spread of hepatitis B infection. Gitnick¹⁵ found the presence of HBsAg in saliva, sneeze

droplets, vaginal secretion, tears, urine, blood, faeces and semen.

Catterall¹⁶ commented that there was growing evidence of the transmission frequently occurring between sexual partners and of male homosexuals and bisexuals being especially liable to develop the disease. The practice of swallowing semen is probably an important factor and the sexual transmission is one of the most frequent methods of spread of hepatitis B virus.

Schneider et al found that HBsAg was more in white patients with STD than white blood donors. Blacks did not show increased prevalence with STD. Heterosexual transmission is less likely. It is largely acquired before the age of sexual maturity. Colman¹⁸, Dietzman¹⁹ found 9 to 10 fold greater prevalence of present or past hepatitis B infection in homosexuals versus heterosexual males in England and the U.S.A. Skinhoj et al²⁰ suggested that the presence of 3 to 6% HBsAg positive individuals in the homosexual subpopulation represented a reservoir of infection and may well explain the reported high incidence of acute hepatitis in their group.

The reason for discrepancy between the different groups of HBsAg carriers is not clear, but a possible explanation is that they represent difference in the duration of infection. However, other explanations may be difference in the route of infection, concomitant or previous infection with other agents and difference in hormonal or genetic factors.

This study and the review of literature indicate that there is a significant incidence of HBsAg in patients suffering from sexually transmitted diseases.

Acknowledgement

Authors are thankful to the Director, Institute of Post Graduate Medical Education and Research, Calcutta and the Surgeon Superintendent, S.S.K.M. Hospital for allowing to study the clinical material of the Institute and Hospital.

References

1. Blumberg BS : Polymorphisms of serum proteins and the development of isoprecipitin in transfused patients, *Bull NY Acad Med* 1964, 40 : 377.
2. Mirick GS and Shank RE : An epidemic of serum hepatitis under controlled conditions, *Trans Am Clin Chem Ass* 1969, 71 : 176
3. Fulford KWM, Dane DS, Catterall RD, Woof R and Denning JV : Australia antigen and antibody among patients attending a clinic for sexually transmitted diseases, *Lancet* 1973, i : 1470.
4. Heningst W : Sexual transmission of infections associated with hepatitis B antigen, *Lancet* 1973, ii : 1395.
5. Jeffries DT, James WH, Jefferiss FJ, Macleod KG and Wilco RR : Australia (hepatitis associated) antigen in patients attending a venereal disease clinic, *Brit Med J*, 1973, 2 : 455.
6. Krugman S and Giles JP : Viral hepatitis—new light on old disease, *JAMA* 1970, 210 : 1019.
7. Lenka MR and Ghosh Ela : A study on the prevalence of Australia antigen and antibody in a Calcutta Population with special reference to the liver function tests. *Proceedings of 3rd All India Congress of Cytology and Genetics*, Hissar, 1978.
8. Pesenderfer FO, Krassnitzky O and Wewalka F : Immunoelectrophoretischer Nachweis von Hepatitis associated antigen (Au/SH antigen). *Klin Wschr* 1970, 48 : 58.
9. Vranckz R : Hepatitis B antigen and serological evidence of syphilis, *Lancet* 1975, i : 1193.

10. Adam E, Hollinger FB, Melnick JL, Duenas A and Rawl WE: Type B hepatitis antigen and antibody among prostitute and nuns: a study of possible venereal transmission *J Inf Dis* 1974, 129:317,
11. Rederker AL, Mosley JW, Gocke IJ, McKee AP, Pollack W: Hepatitis B immunoglobulin as a prophylactic measure for spouses exposed to acute type B hepatitis, *New Eng J Med* 1975, 293:1055
12. Heathcote J and Sherlock S: Spread of acute type B hepatitis in London, *Lancet* 1973, i: 1468.
13. Lim KS, Fulford KWM, Catterall RD, Dane DS, Taan V and Simpson R: 1976 In proceedings of Anglo American Conference on sexually transmitted diseases, June 1975 New York, Academic Press.
14. Szmuness W, Much MI, Prince AM, Hoofnagle JE, Cherubin CE, Harley EJ, and Block GH: On the role of sexual behaviour in the spread of hepatitis B infection, *Ann Intern Med* 1975, 83: 489.
15. Gitnick GL: The liver and antigens of hepatitis, *B Ann Int Med* 1976, 85:488.
16. Gatterall RD: The sexually transmitted diseases in Recent Advances in Dermatology, edited by Arthur Rook, No. 4, Churchill Livingstone, 1977, pp 52-53.
17. Schneider J, King L, Macnae GM and Kew MC: Hepatitis B surface antigen and antibody in black and white patients with venereal diseases *Brit J Vener Dis* 1977, 53: 372.
18. Coleman C: Hepatitis B antigen and antibody in a male homosexual population *Brit J Vener Dis* 1977, 53: 132.
19. Dietzman DE: Hepatitis B surface antigen and antibody, Prevalence in homo and heterosexuals men *JAMA* 1977, 238: 2625.
20. Skinhoj P, Hoybye G, Hentzer B, Faber V and Poulsen H: Chronic hepatitis B infection in male homosexuals, *J Clin Path* 1979, 32: 783.