

SHORT COMMUNICATION

Sero prevalence of Hepatitis B virus among infertile women recruited for Assisted Reproduction Technology (ART)

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ABSTRACT

Aim: Sexually transmissible diseases such as Hepatitis B virus (HBV) causes or induces incurable often fatal infections have been transmitted through Assisted Reproduction Technology (ART). This study is to determine the seroprevalence of HBV among infertile women recruited for intrauterine insemination (I.U.I).

Methodology and Results: A 5mL of blood was collected and serum aspirated. The detection of HBV was carried out using global one-step rapid test kit relative sensitivity of 99% and specific of 97%. Age range of infertile women was 20 – 49 years. Approximately 30 (5.9%) out of the 512 recruited women were seropositive for HBV with increase in prevalence rate among age group of (25 – 29 years) and (30 – 34 years). The rate of infection of HBV was found to be insignificant in this study using chi-square statistical analysis ($p > 0.0001$).

Conclusion, Significance and Impact of Study: Though the rate of the virus infection were statistically insignificant but the screening should be a continuous exercise and be carried out by all fertility center.

Keywords: Hepatitis B virus, infertile women, Assisted Reproductive Technology (ART)

INTRODUCTION

Assisted Reproductive Techniques such as In Vitrofertilization (IVF), Intracytoplasmic Sperm Injection (ICSI), Intrauterine Insemination (IUI), etc are increasingly being used. Besides the well-established Prognostic factors for success, such as the age of the women, the hyperstimulation protocol used the number and the quality of transferred embryos, other factors such as contamination and transmission of infection can also impinge on the success rates of an IVF programme/treatment.

Sexually transmitted diseases and among them viruses have always pre-occupied teams practicing Medically Assisted Reproduction but mainly as a threat that should be avoided as much as possible. One of the viral infections that is well pronounced in the list of viruses is the Hepatitis B virus. This pathogen which may cause or induce other incurable often fatal infections has been transmitted through Assisted Reproduction Technology (ART) and insemination procedures and can be transmitted from infected mothers to the fetus or new born (Abusheikha *et al.*, 1999). Most infected women are in their reproductive years (Alter *et al.*, 1986) and it is quite likely that they will continue to want and to have children (Berry *et al.*, 1987).

HBV, a double-stranded DNA virus, is a major cause and chronic hepatitis, cirrhosis, and hepatocellular cancer. HBV is one of the most common infectious diseases in the world. It has been estimated that 350 million people worldwide are HBV carriers (Custer *et al.*, 2004). HBV can be transmitted parenterally, sexually, vertically, and via other routes of mucosal exposure. Approximately 25% of regular sexual contacts of HBV-infected persons will become seropositive for HBV (Mosley, 1975), and HBV has been transmitted through artificial insemination.

This prospective study was designed to determine the seroprevalence of this chronic viral agent among infertile women recruited for Intra Uterine Insemination (IUI) in Benin City, Nigeria with a view to ensuring that appropriate precautions are taken to minimize risk of the virus transmission to partners and offspring. This will no doubt help to prevent further spread and adverse outcome caused by this pathogen.

MATERIALS AND METHODS

Sera from 512 infertile Women Attending Fertility Clinic at Human Reproductive Research Programme/ In Vitrofertilization (HRRP/IVF) Centre at the University of Benin Teaching Hospital (UBTH), Nigeria from June 2007 to May 2009 were screened for the presence of Hepatitis B antibody to virus HBV. All the women based on their

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clinical laboratory and gynaecological evaluations were programmed for Assisted Reproduction Treatment (ART). They were subjected to initial comprehensive medical interview including family history, past medical life, sexual and social history Present and past marital status including any gynaecological problems by the clinician.

A 5 mL of blood was collected from each of the participant into plain containers to aspirate the serum for the screening. The detection of the antibody to HBV was carried out on each of the patient serum using one step Hepatitis B surface Antigen Screening test kit. The test procedure was according to the manufacturer's instructions and guidelines in line with the laboratory Diagnosis of Sexually Transmitted Diseases (STDs) of WHO (1999). Global One-Step rapid test kit for qualitative detection of Hepatitis B surface antigen in serum or plasma was used. The kit was produced by Global Strips Reagents made in USA with relative sensitivity of 99% and specificity of 97%.

Chi-square statistical analysis was used to evaluate the level of significance of the Virus in relation to the number of participants screened/age of the infertile women.

The age range of the infertile women in this study was 20-49 years.

RESULTS

Out of the 512 infertile women recruited for this programme, 30 (5.9%) were seropositive for HBV. Increase in prevalence rate was observed among infertile women in age groups of (25-29) and (30-34) years with prevalence of (7.5%) and (6.9%) respectively, (Table 1).

Though the rate of infection of HBV was found to be insignificant in this study using chi-square statistical package ($p > 0.0001$) but the screening of this viral agent should be a continuous exercise and should be carried out in all the fertility centers.

Table 1: Age classification of infertile women screened for HBV

Age(yrs)	No. Exam	No. Positive	% Positive
20-24	34	2	5.8
25-29	106	8	7.5
30-34	144	10	6.9
35-39	80	4	5.0
40-44	82	3	3.6
45-49	66	3	4.5
Total	512	30	5.9

DISCUSSION

The primary goals of microbial screening of infertile women enlisted for ART such as artificial insemination is to provide prognosis for the fertility and to obtain a

successful pregnancy outcome for both the mother and foetus.

The result obtained (5.9%) from this screening is giving room for concern to reproductive specialist. This prevalence rate is also similar to the 2-15% collaborative screening carried out in previous work of (Mishra and Seef 1992).

Contamination with HBV has been documented in ART clinics and blood banks (Hadler and Margolis, 1993).

Knowledge is now accumulating on the fertility characteristics of these patients, on sperm preparation, on the use of assisted reproductive techniques for infected patients.

In some studies, chronic *Hepatitis B virus* does not seem to influence the course of pregnancy and such an infection has no adverse effects on pregnancy but when the future mother is HBsAg-positive, the couple is exposed to the evolution of the diseases in the mother with possible infection of the new born or fetus and adverse pregnancy outcome (CDC and Prevention, 1988).

Couples in which one or both partners are infected with a sexually transmissible pathogenic virus should receive in-depth pre-conceptional counseling on the risks of sexual and vertical transmission of their infections. Adoption and, in circumstances involving an infected man and uninfected woman, donor insemination should be presented as the safest options. Couples who decide to proceed with partner-IUI or other fertility treatment must agree to reasonable interventions aimed at reducing the transmission risk.

In couples who are discordant for HBV infection, the partner who is seronegative should be vaccinated against HBV. Fertility treatments maybe initiated once the vaccinated partner's anti-hepatitis B surface antibody titer (HBsAB) is positive. Modified sperm washing to reduce viral load is not required after the female partner is immunized against *HBV*. If the female is the infected partner and is HBsAB positive, her newborn should receive immunoprophylaxis within 12 h after birth. Immunoprophylaxis consists of both *HBV* vaccine and immunoglobulin, and is repeated at six months of life. Breastfeeding is not contraindicated in women chronically infected with HBV (Hart *et al.*, 2001).

With respect to the offspring that may result from the treatment of infertility, the European Society of Human Reproduction and Embryology (ESHRE) recommends the screenings of both Partners for HBV and Hepatitis C virus (HCV) before ART procedure are started. The ARSM also recommend viral STI Screening for couple of risk for infection and for all women receiving treatment involving the use of semen.

In conclusion, counseling and education concerning safe sex practices should be provided and emphasized. In cases where the male, but not the female, partner is infected, the couple should understand the merits of using condoms throughout fertility treatment, pregnancy, and the postpartum period. Serial diagnostic testing of the uninfected partner is recommended throughout treatment and pregnancy and for both mother and infant during the first year after birth. Informed consent should be explicit

and as thorough as possible, emphasizing that risk of transmission cannot be completely eliminated even specific risk reductions strategic are employed. In-depth psychological, medical, and obstetrical care can be provided by a multidisciplinary medical team.

REFERENCES

- Abusheikha, N., Akagbosu, F., Marcus, S., Lass, A., Cousins, C. and Brinsden, P. (1999).** Viral screening and assisted conception treatment-the bourn hall experience. *Journal of Assisted Reproduction and Genetics* **16**, 337-339.
- Alter, M. J., Ahtone, J., Weisfuse, I., Starko, K., Vacalis, T. D. and Maynard, J. E. (1986).** Hepatitis B virus transmission between heterosexuals. *Journal of America Medical Association* **256**, 1307-1301.
- Berry, W., Gottesfeld, R., Alter, H. and Vierling, J. (1987).** Transmission of Hepatitis B virus by artificial insemination. *Journal of America Medical Association* **257**, 1079-1081.
- Centre for Disease Control and Prevention (1988)** Perspective in disease prevention and health promotion update: Universal precautions for prevention of transmission of human immunodeficiency virus, Hepatitis B virus and other blood borne pathogens in health-care settings. *MMWR Morbidity, Mortality Weekly Report* **37**, 377-388.
- Custer, B., Sullivan, S. D., Hazlet, T. K., Iloeju, U., Veenstra, D. L. and Kowdley, K. V. (2004).** Global epidemiology of Hepatitis B virus. *Journal of Clinical Gastroenterology* **38** (10 Suppl), S158-168.
- Hadler, S. C. and Margolis, H. S. (1993).** Epidemiology of Hepatitis B virus infection. *In: Hepatitis B Vaccines in Clinical Practice.* Ellis, R. (ed.). Marcel Dekker, New York. pp. 141-157.
- Hart, R., Khalaf, Y., Lawson, R., Bickerstaff, H., Taylor, A. and Braude, P. (2001).** Screen for HIV, hepatitis B and C infection in a population seeking assisted reproduction in an inner London hospital. *British Journal of Obstetric Gynaecology* **108**, 654-656.
- Mishra, L. and Seef, L. B. (1992).** Viral hepatitis, A through E, complicating pregnancy. *Gastroenterology Clinical North American Journal of North America* **21**, 873-887.
- Mosley J. W. (1975).** The epidemiology of viral hepatitis: an overview. *American Journal of Medical Science* **270**, 253-270.
- World Health Organization (WHO) (1999).** Laboratory diagnosis of sexually transmitted disease. ISBN **92(4) 1545011**.