

## Incidence of syphilis, hepatitis B, hepatitis C and HIV in antenatal mothers

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### ABSTRACT

All diseases are due to interaction of nature and nurture, environment and genetics. However the extent of their contribution varies. Still the desire to live as long as possible is always there. Diseases are our biggest enemies because they prevent us not only from enjoying a happy and healthy life, but also cut short our stay on this earth. The hepatitis viruses, a heterogenous group of viruses with tropism for the liver, are the major causes of viral hepatitis. Hepatitis B and C viruses are also responsible for many cases of hepatocellular carcinoma. Syphilis is a sexually transmitted disease caused by a bacterium called *Treponema pallidum*. Syphilis can be spread during vaginal, anal or oral sex through contact with an open sore or contact with a skin rash. HIV (Human Immunodeficiency Virus) is a virus that causes AIDS (Acquired Immunodeficiency syndrome) a health condition in which a person is affected by a series of diseases because of poor immunity. HIV by itself is not an illness and does not instantly lead to AIDS. HIV is a complex retrovirus around 120nm in diameter and roughly spherical and belong to the family Retroviridae. The present work focused in incidence of hepatitis B, hepatitis C, Syphilis & HIV in antenatal mothers was carried out on Apollo BSR Hospital, Bilaspur. Most of the patients were coming from the rural area of Chhattisgarh. During the test it was also seen that the prevalence of all the three diseases is in between age group of 20-30. Blood sample were collected from the out patients department (OPD) of the medical college. Samples were taken from antenatal mothers. Samples were collected through disposable syringes into a sterile test tube for serum separation. Since all these diseases are transferred through blood and can easily been transmitted from mother to fetus so all antenatal mothers are screened easily by testing to eradicate the pathogenic action of the disease and remove them completely from the society. In our country, pregnant mothers do not always attend the antenatal clinics and take adequate treatment. Further resort to traditional remedies or purchased antibiotics can lead to increased opportunity of transmission and delay in cure. So, from the available detail shows that these diseases are present in antenatal mothers & therefore all antenatal mothers should be routinely only 12% were found to be HIV positive, 9% were found to be positive for hepatitis B, 7% were found positive to hepatitis C and 5% were found to be positive for syphilis. 1 patient is positive for both syphilis and hepatitis C, 1 positive for both HIV and Hepatitis C, 1 patient positive both for Hepatitis B and C, 1 patient was positive for Hepatitis C and syphilis. This reveals that the antenatal mother caring both the diseases can transfer the same to the child.

**Key words:** Blood Samples, Antenatal Mothers, Pregnant Mothers, Pathogenic Action, ELISA Test.

### INTRODUCTION

Diseases are our biggest enemies because they prevent us not only from enjoying a happy and healthy life, but also cut short our stay on this earth. All diseases are due to interaction of

nature and nurture, environment and genetics. Most of the infectious diseases, like Tuberculosis (TB), Typhoid, Malaria, Infective Hepatitis, Tetanus, Cholera etc., which will kill lakhs of people every year in underdeveloped or developing countries, have been completely wiped off from the developed

nation. The *hepatitis* viruses, a heterogenous group of viruses with tropism for the liver, are the major causes of viral hepatitis. Hepatitis B and C viruses are also responsible for many cases of hepatocellular carcinoma. In some rare cases, the Epstein Barr virus (which causes mononucleosis) can also result in hepatitis because it can cause inflammation of the liver. Other viruses that also can cause hepatitis include *hepatitis* D and E and Cytomegalovirus (CMV)<sup>1</sup>.

*Hepatitis* A (HAV) causes an acute, highly contagious form of hepatitis previously known as infectious hepatitis. It is a subacute disease that mainly occurs in children and young adults. It is an enterovirus, 27nm in diameter with an icosahedral symmetry. The genome is single stranded linear RNA molecule. Hepatitis B is also called serum hepatitis is caused by the hepatitis B virus (HBV) which is a DNA virus. It can cause a wide spectrum of symptoms ranging from general malaise to chronic liver disease that can lead to liver cancer. It is 42nm in diameter and an outer lipid envelop of 7nm thickness, which contains Hepatitis B surface Antigen. A genome made of a small, circular partly double stranded DNA, with an incomplete positive strand. Hepatitis C spread by direct contact with an infected person's blood. Infection with the hepatitis C virus can lead to chronic liver disease and is the leading reason for liver transplant in the United States. It is an enveloped virus, 35-50 nm in diameter containing a linear, single stranded, positive sense RNA genome enclosed within a protein core. Rizzetto and colleagues of Italy identified a new viral antigen in 1977 in the hepatic cells of some HBsAg carriers. They named it as delta antigen which was thought to be another antigen of HBV. It is now known that delta antigen is the defective RNA virus dependent on the helper function of HBV for its replication and expression. HDV replicates only on HBV infected cells and acquire a HBsAg on its surface. The virus is 35-37 nm in diameter with a very small, single stranded circular RNA molecule. *Hepatitis* E occurs usually in small epidemic in society receiving water through a common source. It is a naked icosahedral virus with 27-30nm in diameter and a single stranded RNA genome. *Hepatitis* G (HGV) is a ssRNA and the mode of infection appears to be parenteral<sup>2</sup>

Syphilis is a sexually transmitted disease caused by a bacterium called *Treponema pallidum*. Syphilis can be spread during vaginal, anal or oral sex through contact with an open sore or contact with a skin rash. The bacterial can enter the body through the penis, anus, vagina, mouth or through broken skin. An infected pregnant woman can pass the disease to her unborn child. It comprise of the following stages: primary stage, secondary stage, latent stage and late stage. It can be spread during the first two stages of the disease, i.e., primary stage and secondary stage.

Human Immunodeficiency Virus (HIV) is a virus that causes AIDS (Acquired Immunodeficiency syndrome) a health condition in which a person is affected by a series of diseases because of poor immunity. HIV by itself is not an illness and does not instantly lead to AIDS. HIV is a complex retrovirus around 120nm in diameter and roughly spherical and belong to the family Retroviridae. It uses the enzyme reverse transcriptase to transform RNA to DNA. HIV can be classified as two types HIV-1 & HIV-2. It has several major genes coding for structural proteins that are found in all retroviruses, and several nonstructural genes that are unique to HIV. It consists of outer envelope, core shell and inner core. Other associated proteins are gp41, GP120 in outer envelope, P17 in outer layer of core shell and P24 in inner layer of core shell. Inner core contain P10 & P32.

The main objective of this work is to diagnose the HIV, syphilis & hepatitis B, C of antenatal mother those who coming at the outpatient department of Apollo Hospital, Bilaspur(C.G). At the same time we were also screening their age group as well as their family history.

## MATERIAL AND METHODS

Blood samples were collected from Apollo Hospital, Bilaspur(C.G). Samples were taken from antenatal mothers. Samples were collected through sterilized disposable syringes into a sterile test tube for serum separation.

**Requirements**

**Hepatitis B**

Test dipstick, desiccant pouch.

**Syphilis**

carbogen reagents, disposable slides, mixing sticks, rubber teats etc.

**HIV**

ELIA reader, sodium hypochloride solution, ELISA washer, incubator, vortex mixer, disposable gloves, etc

**Test Procedure**

Reagents and sample were brought at room temperature before testing.

Carbogen reagent suspension was thoroughly mixed by gentle agitation before testing.

**Hepatitis B**

Virucheck one step test for HBsAg utilizes the principle immune chromatography, a unique two site immunoassay on a membrane. As the test sample flows through the membrane assembly of the test dipstick, the colored monoclonal anti-HBsAg colloidal gold conjugate complexes with the HBsAg in the sample.

**Hepatitis C**

One step cassette style ANTI-HCV test is a rapid, direct binding test for visual detection of hepatitis C antibodies (anti-HCV) in serum. It is used as an aid in the diagnosis of hepatitis C infection. One step ANTI-HCV test is based on the

principle of double antigen sandwich immunoassay for determination of anti HCV in serum. Purified recombinant antigens are employed to identify anti HCV specifically.

**Syphilis**

The testing procedure, the specimen, serum or plasma is mixed with the carbogen reagent and rotated for 8 minutes. If antipodal antibodies are present in the specimen, they will react with the carbogen reagent forming visible black floccules. If antipodal antibodies are not present in the specimen, there will be no flocculation.

**HIV**

Microlisa HIV test is an enzyme immunoassay based on indirect ELISA. HIV envelope proteins GP41, C terminus of gp120 and gp36 for HIV-2 representing immunodominant epitopes are coated onto microtitre wells. Specimens and controls are added to the microtitre wells and incubated.

**RESULTS AND DISCUSSION**

The Present work focused in incidence of Hepatitis B, Hepatitis C, Syphilis & HIV in antenatal mothers was carried out on Apollo Hospital, Bilaspur(C.G). Most of the patients were coming from the rural area of Chhattishgarh. Sample were collected from the out patients department (OPD) of the Hospital. Samples were taken from antenatal mothers. Samples were collected through disposable syringes into a sterile test tube for serum

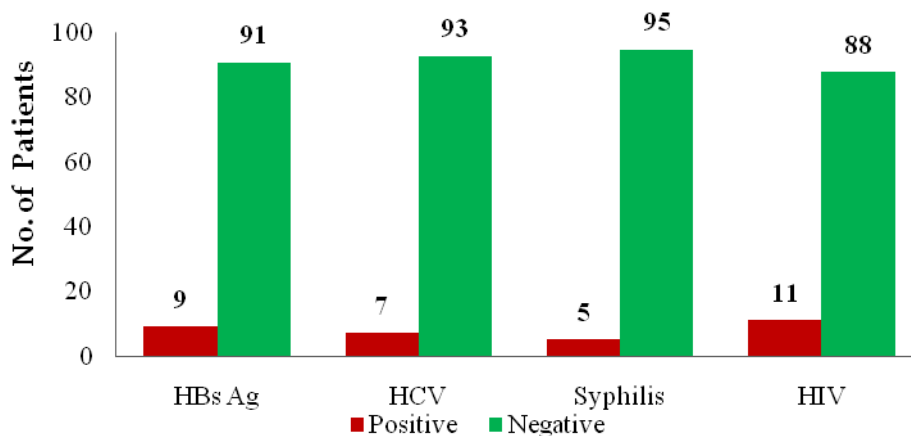


Fig. 1:

**Table1: Details of the patients diagnosed**

Disease	No. of Patients Examined	Positive	Negative
HBs Ag	100	09	91
HCV	100	07	93
Syphilis	100	05	95
HIV	100	11	88

**Table 2: Details of patients with a combination of disease**

Combination of Disease	No. of Patients (out of 100)
Hepatitis B + Hepatitis C	01
Hepatitis C + Syphilis	01
Hepatitis C + HIV	01

separation. Fresh serum is preferable; serum may be stored 2-8°C for upto 24 hrs in case of delay in testing. Hemolyzed or contaminated samples are not used due to improper result

It was observed that out of 100 patients tested for HIV, Hepatitis B, C, and Syphilis only 12 patients were found to be HIV positive i.e., only 12% were found to be HIV positive. 9 patients (9%) were found to be positive for Hepatitis B and only 7 patients (7%) were found positive to Hepatitis C. Only 5% were found to be positive for syphilis. One patient is positive for both syphilis and hepatitis C, 1 positive for both HIV and Hepatitis C, 1 patient positive both for Hepatitis B and C, 1 patient was positive for Hepatitis C and Syphilis. This reveals that the antenatal mother caring both the diseases can transfer the same to the child.

During the test it was also seen that the prevalence of all the three diseases is in between age group of 20-30. Since all these diseases are transferred through blood and can easily be transmitted from mother to fetus so all antenatal mothers are screened easily by testing to eradicate the pathogenic action of the disease and remove them completely from the society. In our country, pregnant mothers do not always attend the antenatal clinics and take adequate treatment. Further resort to traditional remedies or purchased

antibiotics can lead to increased opportunity of transmission and delay in cure. So, from the available detail shows that these diseases are present in antenatal mothers & therefore all antenatal mothers should be routinely tested for both diagnosis and treatment.

### CONCLUSION

The present study has been undertaken to have a view of the trend of STDs in a cosmopolitan city like Bilaspur. Routine antenatal care should be performed to ensure complete removal of these diseases and their transfer from mother to child. Prostitution is very important in developing countries, where the large majority of STD episodes are contracted through them. In some urban and tropical areas, over half of the prostitutes were found to be infected with syphilis or HIV infection.

During the test it was also seen that only 9% patients were seen positive for Hepatitis B & 7% for hepatitis C. out of 100 patients tested for Syphilis only 5 i.e. only 5% were found to be positive. During the test it was also seen that few patients were found to be positive for both syphilis and Hepatitis C. This study reveals that the antenatal mother caring both the diseases can transfer the same to the child. Syphilis was found only in 5% and it was fairly steady during the study period. During the test it was also seen that the prevalence of all the three diseases is in between age group of 20-30. Since all these diseases are transferred through blood and can easily be transmitted from mother to fetus so all antenatal mothers were screened easily by testing to eradicate the pathogenic action of the disease and remove them completely from the society. In our country, pregnant mothers do not always attend the antenatal clinics

and take adequate treatment. Further resort to traditional remedies or purchased antibiotics can lead to increased opportunity of transmission and delay in cure.

Our research was just beginning and a small one. So it has not been possible to give a clear cut conclusion about it. Further study need carry on this work, which will give a good clear idea and definition of statistical identity of antenatal mothers of eastern region.

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#### REFERENCES

1. Chakraborty P. *A Text Book of Microbiology*.1(61) : 559-568 (1995).
2. Crif Moss. Hepatitis C Virus (2000).
3. Ananthanarayan R, Paniker CKJ. Text Book of microbiology. *Orient Longman Private Limited*, 6(62): 539-554 (2000b).
4. Dennie C.C. A history of syphilis. Charles C. Thomas Publisher Springfield , 1.III.(1962).