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# A Study of the Risk Factors of Hepatitis B among Adult Rural Population of Maner Block, Patna

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## Abstract

**Background:** Communicable diseases remain a significant public health problem despite the progress in diagnosis, treatment, and prevention, the wide spread use of antibiotics and vaccination. Now a days, sexually transmitted diseases (STDs); food borne diseases; emergence of antimicrobial resistant bacteria; vector borne diseases and vaccine preventable diseases are still considered of high concern at both national and international levels [1].

**Aims and Objectives:** To Study the Risk factors and association of Hepatitis B in adult population living in rural areas of Maner Block, Patna.

**Material and Methods**

A analytic case control study was conducted in the villages of Maner Block which is the field practice area of the Department of Community Medicine of Indira Gandhi Institute of Medical Sciences, from June 2016 to May 2017 . During the study period health camps were organized in villages of the all the 17 subcentres of Maner Block. two villages from each subcentre were selected randomly for the conduct of the health camps. diseases including Hepatitis B. (HBsAg).

**Results**

The study included 150 participants (50 hepatitis B cases and 100 controls) who agreed to participate in the study and interviewed with a standard questionnaire. The case and control were matched for age and sex. 57 cases were identified as HBsAg positive in which seven cases did not give the consent to participate in the study.

**Conclusion**

Hepatitis B appear to be a major health problem in our community. Our study finding indicated that an intermediate level of hepatitis B and C virus infection among the study groups and routine screening and vaccine schedules (for HBV) may be important. Therefore, screening asymptomatic people is an important instrument in disease detection, prompt diagnosis and intervention.

**Keywords**: Hepatitis B, Risk factor.

## Background

Hepatitis is an inflammation of the liver affecting millions of people every year. Hepatitis is among the most important causes of loss of healthy life . There are different types of viruses which are responsible for viral hepatitis.[1] Of these viruses, hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), hepatitis D virus and hepatitis E virus (HEV) are the most common types of viruses that infect the liver. These viruses are

members of different viral families, but all display a strong hepatotropism and can cause acute or chronic infections. But, infection with hepatitis B viruses and hepatocellular carcinoma (HCC) is responsible for heavy disease burdens.[2]

Hepatitis B virus (HBV) infection is one of the top 10 viral infections globally.[3] Infection with HBV could result in outcomes ranging from an acute, self-limiting disease through chronic hepatitis B (CHB) to cirrhosis and hepatocellular carcinoma (HCC).[4] HBV is one of the main causes of hepatic decomposition, cirrhosis & hepatocellular carcinoma (HCC), and acute disease usually occurs when the immune response is well preserved, while patients with an immunodeficiency are more likely to develop a chronic disease.[1,5]

Viral hepatitis places a heavy burden on the health care system because of the costs of treatment of liver failure and chronic liver disease. In many countries, viral hepatitis is the leading cause of liver transplants. Such end-stage treatments are expensive, easily reaching up to hundreds of thousands of dollars per person. Chronic viral hepatitis also results in loss of productivity. Hepatitis B infections are seen more often in recipients of organs, blood, and tissue, along with persons working or receiving care in health settings, and in vulnerable groups. Viral hepatitis has not received the attention it deserves from the global community. Although the burden of disease is very high, the problem has not been addressed in a serious way for many reasons, including the relatively recent discovery of the causative viruses, the mostly silent or benign nature of the disease in its early stages, and the insidious way in which it causes chronic liver disease.[1]

Viral hepatitis is key public health problems that pose an enormous risk for disease transmission in the general population, especially in children and women. Reliable epidemiological data are essential for planning health programs and facilitating the scaling up of hepatitis treatment as well to identify high risk groups. It is important to know the number of persons infected with and dying from hepatitis related liver disease, the prevalence of hepatitis related morbidity, and the distribution of genotypes and fibrosis stages. This is because the selection of appropriate treatments can depend upon the genotype, and the presence or absence of cirrhosis, while the urgency with which to initiate treatment depends largely on the degree of liver fibrosis. Unfortunately, estimates of these key epidemiological parameters are limited by the lack of data from some parts of the world. This condition is much worse in developing countries like India. The prevalence of viral hepatitis infection varies greatly in different regions of the world and it is high in endemic areas. Although different studies on the prevalence of viral hepatitis have been conducted in different parts of india (especially HBV and HCV), most of them focused on investigating the prevalence among Adult Rural Population, pregnant mothers, blood donors, HIV infected individuals, health care workers and medical waste handlers.

**Aims and Objectives**

1. To Study the Risk factors of Hepatitis B in adult population living in rural areas of Maner Block, Patna.

2. To study the association, if any of Hepatitis B infection with:

- Socio-demographic characteristics.
- Utilization of health care and services such as History of Blood transfusion, Surgery, Hospitalization, Dentist visit etc.
- Personal behaviour such as History of Sexually transmitted disease, Migration, Ear/Nose piercing, Contact with HBsAg positive person.
- Awareness about Hepatitis B.

**Material and Methods**

A analytic case control study was conducted in the villages of Maner Block which is the field practice area of the

Department of Community Medicine of Indira Gandhi Institute of Medical Sciences, from June 2016 to May 2017. During the study period health camps were organized in villages of the all the 17 subcentres of Maner Block. Two villages from each subcentre were selected randomly for the conduct of the health camps. diseases including Hepatitis B. (HBsAg).

**STUDY PARTICIPANTS:** Both cases and controls were selected among the persons above 20 years of age who attended the health camps.

**Selection of Case:** Persons who tested positive for HBsAg in the health camps were approached for consent to participate in the study.

**Inclusion Criteria:** Consenting adults above 20 years of age who tested positive for HBsAg from among those who visited in the health camps were included.

**Exclusion Criteria:** Persons below the age of 20 years, seriously ill and non-consenting persons.

**Selection of Control**: Controls were selected from among other adults who attended the health camp in the same village who are serologically negative for HBsAg and matched with respect to age, sex, religion, with the cases. Cases were matched according to age, sex, occupation, educational levels, and income with a consenting person from the same village who did not test positive for HBsAg in the ratio of 1:2. Thus the number of controls enrolled was 100.

**Data Collection:** After selection, the cases and controls were interviewed using pretested questionnaire Given in table 1,2,3,4,5,6.

**STUDY VARIABLES:**

**Dependant variables**: The hepatitis B infection.

**Independent variables:** The hepatitis B transmission determinants, the exposure to the following risk factors given in Table 1,2,3,4,5,6.

**Data Analysis:** Data collected were entered in Microsoft Excel, 2007 and analysis was done by SPSS Version 17.

- Descriptive statistics were computed for the demographic factors of the cases and the controls, and to assess the personal characteristics of the participants.
- Univariate analysis was performed with odds ratio (OR) calculated for risk factors with Chi-square test. Characteristics that were found, through univariate analysis, to be significantly associated with Hepatitis B infection were entered into a logistic regression model, to rule out the confounding factors and to determine which characteristics were independent predictors of Hepatitis B infection status of the participant.
- Odds Ratio was calculated for the all the variables simultaneously.
- Confidence interval was set at 95%. P-value of less than 0.05 was considered to indicate statistical significance.

**Ethical committee approval:** Approval for the study was obtained from the Institutional Research and Ethics Committee of Indira Gandhi Institute of Medical Sciences, Patna and conducted after informed consent was obtained from the participants.

**Results**

The study included 150 participants (50 hepatitis B cases and 100 controls) who agreed to participate in the study and interviewed with a standard questionnaire. The case and control were matched for age and sex.

**A. Socio-demographic characteristics**

Table-1 shows socio-demographic characteristics of participants.

**Table1: Distribution of socio-demographic characteristics of the cases and controls.**

| Variable | Case (n=50) Frequency (%) | Control (n=100) Frequency (%) | P- Value | Total(n=150)Frequency (%) |
|---|---|---|---|---|
| Age | | | | |
| 20-30 | 16(32) | 26(26) | | 42(28) |
| 31-40 | 12(24) | 21(21) | 0.738 | 33(22) |
| 41-50 | 9(18) | 19(19) | | 28(18.7) |
| >50 | 13(26) | 34(34) | | 47(31.3) |
| Sex | | | | |
| Male | 32(64) | 65(65) | 0.904 | 97(64.7) |
| Female | 18(36) | 35(35) | | 53(35.3) |
| Education level | | | | |
| Illiterate | 21(42) | 39(39) | | 60(40) |
| Primary | 9(18) | 8(8) | 0.208 | 17(11.3) |
| Secondary | 13(26) | 30(30) | | 43(28.7) |
| Intermediate | 7(14) | 23(23) | | 30(20) |
| Occupation | | | | |
| Housewife | 15(30) | 31(31) | | 46(30.7) |
| Labour | 26(52) | 49(49) | | 75(50) |
| Businessman | 2(4) | 3(3) | 0.932 | 5(3.3) |
| Officeemployee | 3(6) | 3(3) | | 6(4) |
| Nonemployee | 4(8) | 14(14) | | 18(12) |
| Marital Status | | | | |
| Single | 4(8) | 11(11) | | 15(10) |
| Married | 45(90) | 82(82) | 0.200 | 127(84.7) |
| Widow | 1(2) | 7(7) | | 8(5.3) |
| Family Size | | | | |
| <5 | 34(68) | 63(63) | 0.447 | 97(64.7) |
| >5 | 16(32) | 37(37) | | 53(35.3) |
| Per capita Income | | | | |
| <2000 | 15(30) | 6(6) | | 21(14) |
| <4000 | 18(36) | 43(43) | 0.872 | 61(40.6) |
| <6000 | 12(24) | 21(21) | | 33(22) |
| <8000 | 5(10) | 4(4) | | 9(6) |

## B. Health care services exposure risk facto

Table 2 : Show univariate analysis regarding health care service related risk factors.**:**

**Table 2 : Univariate analysis for the health care service exposure risk factors of Hepatitis B.**

| Variable | Case (Frequency) (%) | Control (Frequency) (%) | p- value | OR (95% C.I) |
|---|---|---|---|---|
| History of Blood Transfusion | | | | |
| Yes | 10 (20) | 4 (4) | 0.004 | 0.17(0.05-0.56) |
| No | 40 (80) | 96 (96) | | |
| History of surgery (major or minor) | | | | |
| Yes | 20(40) | 22(22) | 0.02 | 0.42(0.20-0.89) |
| No | 30(60) | 78 (78) | | |
| History of dentist visit | | | | |
| Yes | | | | |
| No | 17 (34) | 31 (31) | 0.71 | 0.87(0.42-1.80) |
| | 33 (66) | 69 (69) | | |
| History of hospitalization | | | | |
| Yes | | | | |
| No | 22 (44) | 25(25) | 0.02 | 0.42(0.21-0.87) |
| | 28 (56) | 75(75) | | |

## C. Personal behaviour related risk factor exposu

Table 3 show personal behaviour related risk factor exposure.

**Table 3 : Univariate analysis of Personal behaviour related risk factor of Hepatitis B.**

| Variables | Case (Frequency) (%) | Controls (Frequency) (%) | p- value | OR(95%of C.I) |
|---|---|---|---|---|
| History of STD | | | | |
| Yes | 6 (12) | 0(0) | 0.002 | 0.04(0.002-0.75) |
| No | 44(88) | 100 (100) | | |
| Ear/ Nose Piercing | | | | |
| Yes | 17(34) | 34(34) | 1.00 | 1.00 (0.49-2.05) |
| No | 33(66) | 66(66) | | |
| History of perused needle stick injury | | | | |
| Yes | 5(10) | 0 (0) | 0.01 | 19.68(1.04-373.32) |
| No | 45(90) | 100 (100) | | |
| History of Migration | | | | |
| Yes | | | | |
| No | 15(30) | 18 (18) | 0.09 | 0.0.51(0.23-1.13) |
| | 35(70) | 82(82) | | |
| High Risk Behaviour | | | | |
| Yes | | | | |
| No | 2(4) | 0(0) | 0.21 | 0.16(0.01-4.0) |
| | 48(96) | 100(100) | | |
| Family history of Hepatitis B | | | | |
| Yes | 16(32) | 8(8) | 0.0002 | 5.41(2.12-13.79) |
| No | 34 (68) | 92(92) | | |
| Contact with HBV patient | | | | |
| Yes | | | | |
| No | 9(18) | 7 (7) | 0.04 | 0.34(0.12-0.98) |
| | 41(82) | 93(93) | | |

## D. Information about awareness of Hepatitis

Table 4 shows the information about awareness of hepatitis B in case and controls.**B**

**Table 4 : Information about awareness of Hepatitis B among case and controls.**

| Variables | Case (50) | Control (100) | p-value | OR(C.I) 95% |
|---|---|---|---|---|
| History of vaccination | | | | |
| Yes | 2(4) | 13(13) | 0.083 | 0.279(0.06-1.29) |
| No | 48(96) | 87(87) | | |
| Awareness of Hepatitis B | | | | |
| Yes | 26(52) | 65(65) | 0.12 | 1.71(0.86-3.42) |
| No | 24(48) | 35(35) | | |
| History of jaundice > 6 month ago | | | | |
| Yes | 26(52) | 25(25) | 0.001 | 0.31(0.15-0.63) |
| No | 24(48) | 75(75) | | |
| Tested for HBsAg in Past | | | | |
| Yes | 23(46) | 18(18) | 0.0003 | 0.26(0.12-0.59) |
| No | 27(54) | 82(82) | | |

**able 5 : Knowledge about modes of transmission of Hepatitis B among cases and controls.**

Table 5 show the information about modes of transmission of hepatitis B.

**Table 6: Binary Logistic Regression analysis for Hepatitis B risk factor** Table 6 shows the binary logistic regression of the risk factors found significantly associated with the acquisition of Hepatitis B infection.

| Variable | Case (%) | Control (%) | p- value | OR(95% of C.I) |
|---|---|---|---|---|
| History of Jaundice | 26(52) | 25 (25) | 0.011 | 5.33(2.16-13.16) |
| History of Blood Transfusion | 10 (20) | 4(4) | 0.24 | 0.37(0.07-1.99) |
| Treatment for STD | 6 (12) | 0 | 0.75 | 0.04(0.002-0.75) |
| Contact with Hepatitis B patient | 9(18) | 7(7) | 0.87 | 0.89(0.24-3.40) |
| History of Surgery | 20(40) | 22(22) | 0.57 | 0.70(0.20-2.45) |
| History of Preused needle stick injury | 5(10) | 0 | 0.81 | 0.05(0.03-0.96) |
| History of Hospitalization | 22(44) | 25(25) | 0.37 | 0.60(0.20-1.84) |
| Family history of Hepatitis B infection | 16(32) | 8(8) | 0.002 | 0.15(0.45-0.51) |

| Variable | Case(50) | Control(100) |
|---|---|---|
| Blood | | |
| Yes | 20 | 23 |
| No | 30 | 77 |
| Sexual | | |
| Yes | 10 | 23 |
| No | 40 | 77 |
| Water | | |
| Yes | 17 | 52 |
| No | 33 | 48 |
| Food | | |
| Yes | 24 | 51 |
| No | 26 | 49 |
| Other/ Don't know | | |
| Yes | 15 | 26 |
| No | 35 | 74 |

**Discussion**

HBV infection are significant health problems around the globe. Both infections are associated with a broad range of clinical presentations ranging from acute hepatitis to chronic infection that may be clinically asymptomatic or may progress to chronic hepatitis and liver cirrhosis[7]. Population based serological studies of viral hepatitis have demonstrated the diversity of epidemiological patterns with regard to the risk of acquiring infection related to personal attributes, place and risk distribution over time. Screening asymptomatic people is an important instrument in disease detection, prompt diagnosis and intervention, particularly at an early stage of the disease. This may improve the health outcome as well as better understanding of the transmission pattern of the disease[8].

Both case and control groups showed male predominance. Among cases 64% of them are male and about 36% are female in controls 65% are male and 35% are female.

There are Several studies conducted in Egypt, Turkey and Brazil, showed that male was considered as a risk factor for HBV infection. In some studies conducted in Greece, Taiwan and Iran, one of the risk factors mentioned for HBV was male sex.

In another study conducted in Taiwan, risk factors for HBsAg positivity were male sex, age 50 years, and a family history of hepatocellular carcinoma.

The most common age group which are positive for HBsAg are between 20-30 years and are about 32% in cases followed by >50 years about 26% and in control 26% and 34% respectively The most common age group which are positive for HBsAg are between 20-30 years and are about 32% in cases followed by >50 years about 26% and in control 26% and 34% respectively.The majority of study population was young adults. This result may be due to the rising incidence of risk factors for hepatitis B infection toward the end of adolescence. As well, this is consistent with the allowed age range of blood donation and employment. This age coincides with the onset of high-risk behaviours, such as unsafe sexual practices and

injecting drug use. Thus, we hypothesized that these high-risk behaviours are risk factors for infection.

Majority of the participant are illiterate. Among cases 42% of them are illiterate and among controls 39% of them are illiterate. Study show that educational level also have important role in the acquiring of hepatitis B infection. Though our study show that these are not a significant risk factor.

Regarding the occupation the majority of cases about 52% are labor and among controls 49% are of labor class population. The higher incidences of hepatitis B in these populations are due to risky social activities or unhygienic living habits, and other factors. These factors may increase the risk of contact and rate of infection compared with others. These differences were correlated with a high infection rate, but further investigations are needed for better understanding the mechanisms of these relationships. In our study 68 % of cases had family size less than 5 and 63% of controls having family size less than 5.

Regarding per capita income 34% of cases having income less than 4000 per month and among controls 43% of participants having per capita income less than 4000 per month. Nearly 90 % of cases are married and among controls 82% are married. They shows both case and controls are well matched hence comparable.

Our study does not show any significant difference in socio- demographic characteristics among case and controls hence socio- demographic characteristics are not statistically significant risk factor in our study.

The univariate analysis of the data identified history of blood transfusion, history of surgery, history of hospitalization and past history of jaundice as a risk factor for Hepatitis B infection.

Our study shows that history of hospitalization is significantly associated with hepatitis B infection. About 22 cases having history of hospitalization in past. Duration of hospitalization is also important in those cases, most of them having hospitalization for more than 7 days.

A study done in India to assess the knowledge and the practice of the nurses and doctors toward the infection and prevention measures, showed the lack of both the knowledge and practice, exposing the patients and themselves to nosocomial infection.

This is consistent with what have been shown in study done in different places; as in Moldova, in Brazil and in KSA. In KSA, Bani I, conducted a cross sectional study among pregnant women to assess the prevalence of Hepatitis B and its associated factors. They showed that hospitalization is a significant risk factor for hepatitis B infection**.** This result could indicate deficiencies in health care workers knowledge and practice of the standard infection prevention and control precautions in health care settings.

A significant relation was found between blood or blood product transfusion and Hepatitis B infection; 10 (20%) of the cases received blood (or any of its products) compared to 4 (4%) of the controls. Thus Blood transfusion as a significant risk factor for Hepatitis B infection, by univariate analysis this might be due to improper screening of blood before transfusion.

A study conducted in Nigeria among pregnant women showed that the history of blood transfusion is a significant risk factor. As well, a cross sectional study done among health care workers in Uganda showed same results. This finding support the conclusion by Al-Hindi and colleagues that the routine tests screening of blood units and its products to detect Hepatitis B infection by HBsAg test alone is not enough in and there is a need to consider introducing Anti-HBc test and HBV DNA in order to discover the occult HBV, to minimize the risk of HBV transmission by blood and its products.

In Brazil, it was shown that blood transfusion is among the predictors of the HBV exposure. In two different studies conducted in Italy, blood transfusion and surgical intervention were among the independent risk factors.

Forty two of the participant having history of surgery in past among those 20 are cases and 22 are controls. This difference in proportions was found to be statistically significant, (P value 0.02, OR=0.42). Thus history of surgery either major or minor is significantly associated with the development of hepatitis B infection. The finding that exposure to unsafe invasive medical procedures contributes to HBV transmission is consistent with other studies, indicating deficiencies in standard infection control precautions in the local health care setting. This may be due to proper precaution was not taken during surgical procedure. However, performance of some invasive procedures through the informal sector remains a risk, and awareness campaigns directed towards the public need to be launched to raise public demand for safety.

It has been shown in several studies that dental procedures are the risk factors for HBV acquisition due to lack of sufficient knowledge in clinical infection control. Our study revealed that dental visit is not a risk factor, whereas experimental dental visit increases the chance of HBV infection possibly due to not having the knowledge and it was found as an independent risk factor for its transmission.

Past history of jaundice especially more than 6 month ago is significantly associated with acquiring of hepatitis B infection. Our study reveals that 52% of cases having past history of jaundice and 25% of control having past history of jaundice.

The unsafe and unhygienic personal and community practices are risk factors of Hepatitis B transmission. Family history of Hepatitis B, contact with Hepatitis B patient, past treatment of STD and history of perused needle stick injury was most important risk factor.

Past treatment of STD is significantly associated with acquiring hepatitis B infection, which indicates that STD clinic population may be considered a high risk group, that these risk groups should be screened for HBV and that counselling and contact tracing seems to be of great importance. In our study 12% of cases having past treatment of STD.

The risk of transmission of HBV is known to be high in people who are in contact with chronically infected subjects. In Amazon, the high prevalence among siblings clarifies the importance of personal contact in the transmission of this virus.

The most important risk factor for HBV infection was contact with an infected person in Romania and in Thailand. In Greece, one of the major independent risk factors was interfamilial exposure. In Italy, being the household of a chronic HBsAg carrier was independently associated with hepatitis B .

In France, among military recruits, mention of a family history of hepatitis B was a significant predictor of infection. In an area of Nepal, household contact was an independent risk factor. In Korea, it has been shown that HBV has strong familial clustering.

Our study also strongly revealed that contact with HBV-infected person is an independent risk factor for its spread. The major spread of HBV infection in the community occurs during childhood and with familial contact. Horizontal transmission related to poor injection practices and sexual behaviour may be important factors for maintaining the spread and prevalence of HBV infection in the community.

Most of the participants did not know about the modes of transmission of hepatitis B only about 52% of cases know about correct modes of transmission and about 65% of controls having knowledge of hepatitis B transmission.

Thus knowledge about mode of transmission is also important in acquiring the disease in the community. Routine screening and vaccination is one of the most important preventative measures adopted to prevent and control Hepatitis B infection at the community level. Our study revealed that only 15 of the study participant reported being vaccinated against Hepatitis B; 2 of the cases and 13 of the controls.

The findings in this study, using the univariate analysis, identified that history of blood transfusion, past history of jaundice, history of surgery and history of hospitalization, as significant health related risk factors. On the other hand, the significant personal behaviour risk factors are past treatment of STD, contact with Hepatitis B patient, history of perused needle stick injury, and family history of Hepatitis B.

After use of the logistic regression of these risk factors; to control for confounding factors, just the past history of jaundice and family history of hepatitis B remained the independent risk factor for Hepatitis B transmission.

**Conclusion**

This case-control study was an effort to highlight the main risk factors that lead to Hepatitis B Virus infection. The present study shows that the known risk factors are also significant in the transmission of Hepatitis B in Bihar. Migration which is the bane of our state was not significantly associated with hepatitis B infection. The study also suggests that episode of jaundice six month or more in the past, household contact/family history of hepatitis B is predictors of chronic hepatitis B infection. The role of universal precaution can't be over emphasized.

It revealed that several high risk behaviours and practices for the transmission of this infection are significantly more prevalent among the cases compared to the controls. Our data indicates that a history of blood transfusion, history of hospitalization, history of surgery, past treatment of STD and family history of hepatitis B are important risk factors for HBV infection in our area. While the study focused in the rural population of Maner block, Patna, it is likely that similar results may be found elsewhere in the country. Identifying groups at risk for susceptibility can assist in the development of national strategies to target specific groups for cost-effective salvage vaccination programs for adults in the future.

The adoption of infection prevention standards as strategy is the key of Hepatitis B prevention and other blood borne pathogens, while health education for the personal hygiene will protect the public, emphasizing on the vaccination of the risky behaviour groups as a first protective line.

However this study suggest that strategy can be instituted to identify the high risk population with past history of jaundice or contact with jaundiced person ( household contact). This study can help in monitor in the population to detect clearing of HBsAg or follow up for further intervention to prevent chronic HBsAg carrier state and its complications.

**References**

1. World Health Organization (2012). Prevention and control of viral hepatitis infection: framework for global action.
2. Saeed, U., Waheed, Y. and Ashraf, M (2014). Hepatitis B and hepatitis C viruses: a review of viral genomes, viral induced host immune responses, genotypic distributions and worldwide epidemiology. Asian Pacific Journal of Tropical Disease, 4(2), 88-96.
3. Pérez CC, Cerón AI, Fuentes LG, Zañartu SC, Balcells MM, Ajenjo HC, Rabagliati BR, Labarca LJ, Acuña LG (2009). Hepatitis B, C, Treponema pallidum and Toxoplasma gondii co-infections in HIV infected patients. Rev Med Chile. 137:641-648.
4. Gerlich WH (2013). Medical virology of hepatitis B: how it began and where we are now. Virology Journal. 10(1):239.

5. Zanetti AR, Van Damme P, Shouval D (2008). The global impact of vaccination against hepatitis B: a historical overview. Vaccine. 26(49):6266-6273.
6. Shepard CW, Finelli L, Alter MJ (2005). Global epidemiology of hepatitis C virus infection. The Lancet infectious diseases. 5(9):558-567.
7. World Health Organization (2016). Guidelines for the screening, care and treatment of persons with chronic hepatitis B and C infection. World Health Organization fact sheet.
8. Wolfgang T, Jeffrey A, and Karen E (2000). Hepatitis C virus quantification: optimization of strategies for detecting low-level viremia. Journal of Clinical Microbiology 38(2):888-91.
9. Simmonds P (2006). Variability of hepatitis C virus. Hepatology. 21(2): 570-583.
10. Ndong-Atome GR, Makuwa M, Njouom R, Branger M, Brun-Vézinet F, Mahé A, Rousset D, Kazanji M (2008). Hepatitis C virus prevalence and genetic diversity among pregnant women in Gabon, central Africa. Bio Medicine Central infectious diseases. 8(1):82.
11. Balew M, Moges F, Yismaw G, Unakal C. Assessment of hepatitis B virus and hepatitis C virus infections and associated risk factors in HIV infected patients at Debretabor hospital, South Gondar, Northwest Ethiopia. Asian Pacific Journal of Tropical Disease. 2014 ;4(1):1-7.
12. Desalegn Z, Wassie L, Beyene HB, Mihret A, Ebstie YA (2016). Hepatitis B and human immunodeficiency virus co-infection among pregnant women in resource-limited high endemic setting, Addis Ababa, Ethiopia: implications for prevention and control measures. European journal of medical research. 21(1):16.
13. Zenebe Y, Mulu W, Yimer M, Abera B (2014). Sero-prevalence and risk factors of hepatitis B virus and human immunodeficiency virus infection among pregnant women in Bahir Dar city, Northwest Ethiopia: a cross sectional study. BioMedicine Central infectious diseases. 14(1):118.