Case Study

Prevalence of HBV, HCV and co-infection with HBV and HCV among the Pregnant Women of Pakistani Population.

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Abstract

Viral hepatitis during pregnancy is associated with higher risks of maternal complications. The epidemiology of viral hepatitis during pregnancy is essential for health planners and programme managers. This study was conducted to determine the prevalence of HBV & HCV infection in pregnant women. It was a hospital based retrospective study. During the study period; a total of 2450 pregnant females were tested for hepatitis B and C. There were 158 females with positive hepatitis results, out of which 130 were hepatitis C positive and 28 were hepatitis B positive. Only 3 females were those having both hepatitis B and C positive. Average age range of women’s was 27-36 years. The data was analyzed by ICT method available at facility of (MCH).We concluded that prevalence of hepatitis B and C in pregnant women is high, of which hepatitis C is more prevalent than hepatitis B and the co-infection of hepatitis B and C was observed as well.

Keywords: Hepatitis B, Hepatitis C, pregnancy, epidemiology

Introduction

Hepatitis is a medical condition defined by inflammation of the liver and characterized by the presence of inflammatory cells in the tissue of an organ. Hepatitis is caused by viruses, alcohol, toxins, drugs, autoimmune condition, metabolic diseases and pregnancy. Viral hepatitis is caused by HAV (hepatitis A virus) HBV (hepatitis B virus) HCV (hepatitis C virus) HDV (hepatitis D virus) HEV (hepatitis E virus).

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are among the principal causes of severe liver disease, including hepatocellular carcinoma and cirrhosis-related end-stage liver disease [1].

Perinatal transmission from mother to her newborn baby is the most important mode of infection. If pregnant women is an HBV carrier and is also positive for hepatitis B ‘e’ antigen (HBeAg), her newborn baby has a 90% chance of becoming infected. Approximately 25% of infected infants will become chronic carriers [2].

Hepatitis C virus (HCV) is one of major etiological agents for parenterally acquired hepatitis. It is asymptomatic in large proportion of cases (64-75%) and revealed
accidentally by abnormal liver function tests or anti-HCV positivity. The long term morbidity and mortality is far greater than its counterpart hepatitis B virus in terms of chronic hepatitis (70%), cirrhosis (20-30%), hepatocellular carcinoma and liver function. HCV can be transmitted through various routes, like blood transfusion, reuse of syringes, organ transplantation, sexual exposure, contaminated instruments, use of multi-dose viral injections, tattooing, body piercing, parental transmission and sharing razors [3].

Chronic hepatitis C is the primary cause of cirrhosis and liver cancer. Liver cirrhosis may lead to portal hypertension, ascites, bruising and bleeding, jaundice and hepatic encephalopathy. It is a common cause of liver transplant [4].

In the pregnant population, the prevalence of HCV is estimated to be about 1%, with the highest prevalence in the black population 6.1% and the lowest in the Latino population 2.8%. Only 25% of pregnant women report receiving blood products’ or using IV drugs when HCV infection is diagnosed. Concurrent alcoholism, IV drug use (38%), and coexisting infection with human immunodeficiency virus (HIV) (33%) are important risk factors [5, 6].

Shams R et al. in 2010 [7], have tested 75777 pregnant women’s for hepatitis B & C. The results of healthy pregnant ladies revealed that the prevalence of both Hepatitis B and C has increased from 2002 to 2008. Prevalence of Hepatitis B increased from 1.4% to 3.4% and Hepatitis C from 6.3% to10.1%. The overall prevalence of HBsAg and HCV antibody in pregnant ladies was 1.9% and 7.4% respectively [7].

Elsheikh RM et al. [8] have carried out a 3 months study from March–June 2006, briefly sera were collected from pregnant women at Umdurman Maternity Hospital in Sudan, and was tested for markers of hepatitis B virus (HBVsAg) and HCV. HBVsAg was detected in 41 (5.6%) out 728 women, Anti-HCV was detected in 3 (0.6%) out of 423 women’s [8].

Khokhar N et, al. 2004 [9] enrolled and checked for anti HCV in all pregnant women presenting in the ante natal clinic of Shifa International Hospital Islamabad, from July 2001 to December 2002, a total of 503 patients were enrolled. 24 (4.8 %) were anti HCV positive [9].

Keeping in view these incidences of hepatitis positive patients, the current study was carried out to determine the prevalence of HBV & HCV in pregnant women’s and assess the frequency of Hepatitis B and C or co-infection among them.

### Materials and Methods

#### Setting and Duration

The present study was carried out at the Maternal and Child Healthcare Center (MCH) of PIMS Hospital for six months.

#### Inclusion and Exclusion Criteria

Indore pregnant female were included while female other than this criteria were excluded for this study.

#### Collection of Blood Samples

Venous blood samples were collected from patients, having HBV, HCV infection. To obtain serum for the determination of HBV and HCV blood was collected in sterile, gel centrifuge tube.

#### Determination of HCV and HBV

The serum samples of pregnant females were analyzed to determine Hepatitis C virus (HCV) and Hepatitis B surface antigen (HBsAg) by using kit method chromatographic immunoassay based on the Principal of Double Antibody-Sandwich technique.

![Figure 1: Frequency of pregnancies according to age group](image)

Figure 1 shows the frequency and percentages of the pregnant females according to their age group. The total sample size was 2450 out of which there were 899 (36.7%) in the group A (17-26), 1379(56.3%) in group B (27-36) and the remaining 172(7%) were in the group C (37-46).

Figure 2 shows that out of our total sample size (N=2450) there were 158(6.44%) pregnant females positive for hepatitis, 28(1.14%) were positive for hepatitis ‘B’ and 130(5.3%) were positive for hepatitis ‘C’. Hepatitis ‘C’ was found more prevalent than hepatitis ‘B’.
In the current study there were 158 females that revealed positive for hepatitis which is 6.45% of the total samples with a hepatitis C predominance contributing 84% and hepatitis B contributing 16%. The ratio from hepatitis B to hepatitis C was 1:4.6. There were only 3 (1.89%) patients positive for both hepatitis B and C. Fig 4.3 illustrates that total 158(6.45%) pregnant females were positive for hepatitis out of which 28(16%) were positive for hepatitis B and 130(84%) were positive for hepatitis C. The ratio of hepatitis B and C in pregnant females was 1:4.6. And only 3(1.89%) were positive for both hepatitis B and C. The data was categorized into three age groups as Group A (17-26 yr), Group B (27-36 yr) and Group C (37-46 yr).

Similar studies in 2010 by Shams R et al 2010 [7] have reported that prevalence of both Hepatitis B and C in pregnant ladies has increased from 2002 to 2008. Prevalence of Hepatitis B increased from 1.4% to 3.4% and Hepatitis C from 6.3% to 10.1%. The overall prevalence of HBsAg and HCV antibody in pregnant ladies was 1.9% and 7.4% respectively. This study revealed that Increase in seropositivity from 1.4 % to 3.4% HBV and HCV 6.3 to 10.1% from 2002 to 2008 was observed.

Another similar study Taseer et al. 2010 [10] reported that out of 500 pregnant women 35 (7.00%) were found to be anti-HCV positive and 23 (4.60%) were positive for HBsAg. Majority of the patients 263 (52.60%) were in the age group 26–35 years. Our study on pregnant women reported low prevalence of HBV and high prevalence of HCV that may be due to the poor hygienic conditions.

Furthermore, Elefsmiotis et al. 2009 [11] demonstrated the overall prevalence of HBsAg among pregnant women in Greece and was estimated to be 4.1% with highest rates among Albanian immigrants 12%. Another study conducted by Lin et al in 2008 [12], reported that from 10,327 pregnant women in Taiwan and 1,418 in other Southeast Asian countries that had an HBsAg positive rate of 15.5% and the other Southeast Asian countries had 8.9%. Taiwanese women had a higher HBsAg positive rate than other Southeast Asian women (15.7% vs. 8.4%).
2007, sheikh et al. [13] carried out a 3 months study markers of hepatitis B virus (HBVsAg) and HCV. HBVsAg was detected in 41 (5.6%) out 728 women, Anti-HCV was detected in 3 (0.6%) out of 423 women. Studies conducted by Mahamat A et al. in 2010 [14] demonstrated hepatitis B surface antigen (HBsAg) prevalence among 2,347 pregnant women according to ethnicity. With 11.0% HBsAg prevalence, Asian women (Hmong and Chinese) were the group with the highest risk of hepatitis B virus (HBV) perinatal transmission compared with other ethnic groups. In 2009, Sheikh et al. [13] reported that among 3020 pregnant women, 102 were positive for HCV antibodies. Among anti-HCV positive women, 8(7.84%) were also positive for HBsAg. In 2001, Gigi RM et al. [15] reported that the prevalence of hepatitis C virus (HCV) infection was studied in 2408 pregnant women. Positive anti-HCV were detected in 47 women (1.95%). Our study on prevalence of hepatitis among pregnant women revealed high percentage which may be due to the fact that it was conducted among the people who have poor socioeconomic status and were not health conscious.

In present study the prevalence of hepatitis B is 1.14% and hepatitis C is 5.30% which is parallel with the previous studies of Pakistan 1.4-3.4% and 6.3-10.1% respectively. While the scenario in general population is also quite high (5.872% and 4.54%). In general population, the risk of transmission may be injections, razors and dental therapy while in pregnant women’s risk of transmission are the instruments (used for surgical or gynecological procedures) which may be the causes of high prevalence. This study suggests that surveillance systems, monitoring policy and evaluation strategies at gross root level may improve the situation which is still very alarming and threatening.

**Conclusion**

Hepatitis B and C is a major public health concern and even with the implementation of interventions and health promotion strategies, it still persist at the same magnitude. Prevalence of hepatitis C virus is more common than hepatitis B virus in pregnant women’s similar to prevalence in general population and though co-infection of hepatitis B and C is low but gravity of problem is double.

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None Declared

**Competing Interest**

The authors declare no competing interests.

**References**


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