

## ORIGINAL ARTICLE

## HEPATITIS B AND HEPATITIS C VIRUS IN WOMEN WITH FIRST PREGNANCY

Shandana Mustafa Jadoon, Muhammad Adeel\*, Shaheen Aslam, Ahsan Rasool\*\*

Department of Obstetrics &amp; Gynaecology, \*Department of Orthopedic Surgery, \*\*House Officer, Ayub Teaching Hospital, Abbottabad-Pakistan

**Background:** Hepatitis B and Hepatitis C are amongst the leading causes of morbidity and mortality in pregnant women throughout the globe. This study is aimed at determining the frequency of these infections among primigravid females and the common factors that make them prone to these infections. **Methods:** This cross-sectional study was conducted at Ayub Teaching Hospital, Abbottabad from December 2015 to May 2016. A total of 174 jaundiced primigravida patients were included in the study through non-probability consecutive sampling. Blood samples were sent for HBsAg and anti-HCV ELISA. Samples were analysed by the pathologist with more than 5 years clinical experience. All data will be analysed using SPSS-16. **Results:** The mean age of the subjects was  $24 \pm 5.7$  years. Six (3.4%) patients were HBsAg positive and 13 (7.5%) were anti-HCV positive. About 9% of patients had undergone surgery in their life and 1.7% reported having received blood transfusion during their life. Thirty-two of them had history of intravenous or intramuscular injections. History of piercing of body part mostly ear-piercing for ornaments was present in 170 (97.7%) respondents. However, the frequency of blood transfusion, surgery and body piercing was not statistically significantly between HBsAg positive, HBsAg negative, and anti-HCV positive and negative patients ( $p > 0.05$ ). **Conclusion:** The incidence of these viral infections in our community is on the rise. It emphasizes the need of routine antenatal screening in pregnant ladies for these viruses and to educate the public about preventive measures against these infections.

**Keywords:** Hepatitis B; Hepatitis C; Common factors, First pregnancy

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## INTRODUCTION

Viral Hepatitis B and C is serious health issue worldwide. Chronic infection with these viruses can eventually leads to cirrhosis and Hepatocellular carcinoma.<sup>1</sup> Hepatitis B is caused by HBV which is a double-stranded DNA virus belonging to the Hepadnaviridae family that has the predilection to affect the liver.<sup>2</sup> Sexual transmission accounts for most adult HBV infections.<sup>3</sup> It is estimated that about 25% of the regular sexual contacts of infected individuals will turn out to be seropositive.<sup>4</sup> Vertical transmission is the predominate mode of transmission in part of the world which are endemic for HBV infection such as the South Pacific and Asia.<sup>5</sup> Vertical transmission occurs in up to 10% of neonates born to mother having acute HBV infection in first trimester whereas 80–90% of neonates show sero-positivity when infection occurs in the third trimester.<sup>6</sup>

Out of these infected infants 90% will go on to develop chronic disease. Whereas 2–6% of infected adults will develop chronic infection and in these individuals 15–25% will be at risk of getting cirrhosis and hepatocellular carcinoma.<sup>4</sup> Looking at broader picture about 240 million people worldwide are affected with HBV, with Africa and Asia ranking highest on the list.<sup>8</sup> Making the situation graver about

more than 780 000 people die every year due to complications of hepatitis B.<sup>9</sup>

Hepatitis C is a liver disease caused by the hepatitis C virus: the virus can cause both acute and chronic hepatitis infection, ranging in severity from a mild illness lasting a few weeks to a serious, lifelong illness.<sup>10,11</sup> The hepatitis C virus is a blood borne virus and the most common modes of infection are through unsafe injection practices, inadequate sterilization of medical equipment, and the transfusion of unscreened blood and blood products.<sup>12</sup> Globally, between 130–150 million people globally have chronic hepatitis C infection.<sup>13,14</sup> Approximately 700 000 people die each year from hepatitis C-related liver diseases.<sup>15</sup>

Pakistan has intermediate endemicity of HBV infection, with carrier rate of around 4%. Infections during pregnancy can lead to various maternal complications as well.<sup>16,17</sup> Early childhood infections are acquired through horizontal transmission, such as breaks in skin or mucus membranes.<sup>18,19</sup> One of the studies quote the prevalence of HBsAg in pregnant women to be about 25% and out of these 61% turned positive for antiHBe and 17% for HBeAg.<sup>20</sup> Chronic liver disease incidence has increased in Pakistan lately and chronic infection with hepatitis C is one of the main cause leading to CLD. Nearly 60–70% patients with CLD

turn out to be positive for anti-HCV.<sup>21-23</sup> HCV serology comes out positive in about 50% patients with hepatocellular carcinoma (HCC) in Pakistan.<sup>24</sup> Again use of unsterilized injections, medical instruments, excessive use of barbers for shaving, unsterilized equipment for ear piercing and dental practices by quacks.<sup>25-27</sup> The perinatal transmission of HCV occurs in 5 percent of infants born to mothers who turn out positive for HCV-RNA.<sup>28,29</sup>

Low educational level and/or low socio-economic status account for prevalence of a number of infectious diseases and these factors are responsible for high endemicity of hepatitis B and C in our country as well. Pregnant women are more vulnerable for getting these infections and passing them on to the next generation. As there are few studies targeting this group so we carried out this study at Ayub Teaching Hospital Abbottabad, with the aim to find out the presence of hepatitis B and C antibodies in pregnant patients attending the gynaecology department and also to identify common factors responsible for the spread of these viral infections.

## MATERIAL AND METHODS

This study was carried out in Ayub Teaching Hospital, Abbottabad in the department of Obstetrics & Gynaecology from December 2015 to May 2016. A total 174 women with first pregnancy were selected carefully by non-probability consecutive sampling all pregnant women presenting in (first pregnancy) with jaundice (yellow discoloration of sclera and serum bilirubin >17µmol/L) and age group between 15-45 years were eligible for study and already diagnosed cases of HBV and HVC on the basis of history and medical record, Patient with chronic liver disease, Patients with haemolytic disorder and Patients with malaria due to plasmodium vivax, malriae or ovale species were excluded from study. Patients were carefully selected on the basis specified criteria as follows:

Hepatitis B virus infection were defining as reactive Enzyme Linked Immunosorbent assay (ELISA) 3<sup>rd</sup> generation for HBsAg with cut off value of 2.0 in the laboratory and hepatitis C virus infection were define as reactive Enzyme Linked Immunosorbent assay (ELISA) 3<sup>rd</sup> generation for anti HCV antibodies with cut off value of 1.0 in the laboratory. Common causative factors were history of surgery which was defined as any type of previous surgery (whether major or minor) even once in the past and blood transfusion was defining history of blood transfusion

even once in the past for any indication. Piercing of body parts were define history of piercing of body parts even once in the past for any indication. History of injection use was defined use of either intravenous and intramuscular injection.

This study was conducted after approval from the ethical board and research committee of the Ayub Teaching Hospital, Abbottabad. The purpose and benefits of study and complete procedure were explained to the patients and written informed consent was obtained.

Brief history about the duration of disease and onset of jaundice were done. General physical examination of the patients and systemic examination were sent to laboratory HBsAg and anti-HCV by ELISA. Samples were analysed by the pathologist with more than 5 years clinical experience. History of blood transfusion, surgery, piercing of body parts and injection use was documented.

All the information was recorded by structured *per forma*.

Data were entered in SPSS-17. Frequency and Percentages were calculated for categorical variables. Mean and SD were calculated for numerical data. Post stratification were done through *chi-square* test Keeping *p-value* ≤ 0.05 will be significant.

## RESULTS

The age ranged from 15 to 45 years. The mean age was 24±5.7 years. The median and mode ages were 24 and 25 years respectively. Hepatitis screening (HBsAg & anti-HCV) was positive in 10.9% of patients. Out of these six patients were positive for HBsAg and remaining for anti HCV. Among common causative factors, most common factor was ornamental body piercing followed by intravenous or intramuscular injections as shown in figure-1.

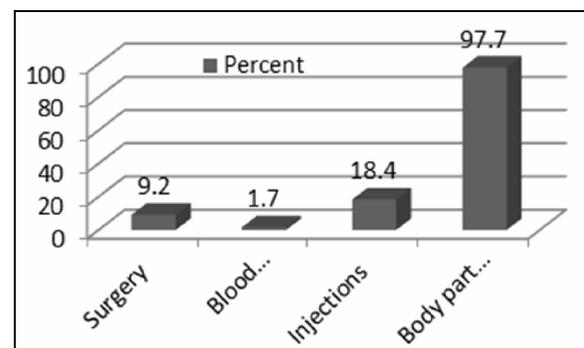


Figure1: Frequency of common causative factors

**Table-1: HCV relation to various causative factors**

		Surgery		p value
		Yes	No	
Anti-HCV	Positive	3 (23%)	10 (77%)	0.072
	Negative	13 (8%)	148 (72%)	
<b>Total</b>		16	158	
		Blood transfusion		p value
		Yes	No	
Anti-HCV	Positive	0	13 (100%)	0.620
	Negative	3 (1.86%)	158 (98.14%)	
<b>Total</b>		3	171	
		Injections		p value
		Yes	No	
Anti-HCV	Positive	3 (23%)	10 (77%)	0.650
	Negative	29 (18%)	132 (72%)	
<b>Total</b>		32	142	
		Body part piercing		p value
		Yes	No	
Anti-HCV	Positive	13 (100%)	0	0.565
	Negative	157 (97.5%)	4 (2.5%)	
<b>Total</b>		170	4	

Among 6 HBsAg positive patients, two (33.3%) had a history of surgery and among 168 HBsAg negative patients 14 (8.3%) had a history of surgery in the past; this difference was not statistically significant ( $p=0.096$ ). Fifty percent of HBsAg positive patients had a history of using injections this difference was statistically significant;  $p=0.042$ .

Out of HBsAg positive patients none had a history of blood transfusion. All the HBsAg patients (100%) had a history of piercing body parts and in HBsAg negative patients, 164 (97.6%) had a history of piercing body parts in the past; this difference was not statistically significant;  $p=0.702$ .

Among 13 anti-HCV positive patients 3 (23%) had a history of surgery and among 161 anti-HCV negative patients 13 (8%) had a history of surgery in the past; this difference was not statistically significant;  $p=0.072$ . Among 13 anti-HCV positive patients none had a history of blood transfusion and among 161 anti-HCV negative patients 3 (1.86%) had a history of blood transfusion in the past; this difference was not statistically significant;  $p=0.620$ . Among 13 anti-HCV positive patients 3 (23%) had a history of using injections and among 161 anti-HCV negative patients 29 (18%) had a history of using injections in the past; this difference was statistically significant;  $p=0.650$ . Among 13 anti-HCV positive patients all (100%) had a history of piercing body parts and among 161 anti-HCV negative patients 157 (97.5%) had a history of piercing body parts in the past; this difference was not statistically significant;  $p=0.565$  (Table-1).

## DISCUSSION

Hepatitis b and C virus infection appears to be on the rise in various parts of the world especially in developing countries.<sup>30</sup> Although the developing

countries have included neonatal immunization and routine screening of antenatal women as part of antenatal and neonatal care, still there has been increase in the number of newly diagnosed cases.<sup>31</sup> Acute infection can present with the dominant symptoms of jaundice, anorexia (poor appetite), malaise or it can be asymptomatic. The progression from acute to chronic hepatitis B and C is usually slow and goes undetected. It is difficult to estimate the time duration for resolution of acute hepatitis B and C because of the subclinical presentation.<sup>32</sup> The fertility rate in Pakistan is quite high, four children per woman. This puts our antenatal population at special risk of acquiring these infections. Furthermore, hepatitis during pregnancy can lead to many maternal complications and very high chance of mother to child transmission. Several studies indicate that hepatitis either due to hepatitis B or C can lead low birth weight, preterm birth, premature rupture of membranes, gestational diabetes and congenital.<sup>33,34</sup> Similarly infection with HCV increases the risk of cholestasis of pregnancy, as well as increase in number of neonatal intensive care unit admission.<sup>35</sup>

Thus, the current study was carried out at Ayub Teaching Hospital Abbottabad, to estimate the prevalence of Hepatitis B and C viruses among primigravida and to identify the factors leading to spread of these viruses. A total of 174 jaundiced primigravida patients were included in the study. The mean age was  $24\pm 5.7$  years. 6 (3.4%) patients were HBsAg positive and 13 (7.5%) were anti-HCV positive. Out of these 16 had history of surgery in past, 3 had history of blood transfusion, whereas 32 give history of intravascular or intramuscular injections. About

177 had history of piercing the body parts mostly ear piercing for stuff. Among HbsAg positive patients the incidence of injections use was quite high  $p=0.042$ . However, the incidence of surgery, blood transfusion and body piercing was not statistically different between HbsAg positive and negative women.  $p < 0.05$ .

When comparing with studies done previously, our study shows the prevalence of hepatitis C among pregnant women to be 7.5%, whereas the earlier study quoted the prevalence of hepatitis c to be 9.2%,<sup>37</sup> which seems to be quite close to our study. But if we look at another study the prevalence of hepatitis C in pregnant population in Pakistan was about 1.42%, which is quite low compared to our study.<sup>38</sup> The difference in socioeconomic status, geographical distribution, different methods of screening used as well less access to hospitals can be the reasons for less prevalence of hepatitis C in the above-mentioned study.

Hepatitis b has also been reported to be highly prevalent among pregnant population in Pakistan and other South Asian countries. The consequences of hepatitis B infection in the form of vertical transmission increases the incidence in new-born babies as well. Comparing to previous study which shows the prevalence to be 3.98%, our study closely follows these results with the prevalence to be 3.4%. Similarly looking into other study conducted in Peshawar district the prevalence was low about 0.34%<sup>39</sup> which again highlights the factors like available health facilities and access of patients to these health facilities as well as lack of awareness among general population about methods of spread and consequences of viral hepatitis infections.<sup>40</sup>

Looking globally the prevalence of hepatitis B and C, is about, 4.0% and 6.4% in Egypt<sup>41</sup>, about 4.6% and 7.0% in Pakistan<sup>42</sup>, very low in turkey approximately 2.8% and 0.1%<sup>43</sup>, in Afghanistan again quite low, 1.53% and 0.31%<sup>44</sup>, whereas 5.6% and 0.3% in Sudan. Here again we can see that our results are comparable to previously conducted studies.

Hepatitis B and C have emerged as major global health issues which need to be tackled at national as well as international level.

## CONCLUSIONS

This study highlights the importance of antenatal screening for hepatitis B and C in pregnant women. This is highly vulnerable group because of the interventions they have to undergo during the process of childbirth makes them more susceptible to getting infected if necessary precautions are not taken. And

they can easily pass these infections to the new-borns. So, it is necessary to have routine antenatal screening for all the antenatal population in order to estimate the burden of the disease and to educate people about protective measures to help limit the spread of such infections.

## AUTHORS' CONTRIBUTION

SMJ, MA: Concept, data collection, literature search, statistical analysis, final write-up. SA, AR: Revision of article & proof reading.

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### Address for Corresponding:

**Dr. Shandana Mustafa Jadoon**, Department of Obstetrics & Gynaecology Unit B, Ayub Teaching Hospital, Abbottabad-Pakistan.

**Cell:** +92 333 503 5464

**Email:** shandana86@gmail.com