

## Risk Factors for Hepatitis C in Pregnant Women

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### ABSTRACT

**Introduction:** The prevalence of Hepatitis in pregnant women is about 6.5 in Pakistan. The frequency of Hepatitis is 7%.

**Objective:** To determine the association of certain risk factors for transmission of HCV infection in pregnant women

**Study Design:** Case control study

**Setting:** Obstetric and Gynaecology Department, Sir Ganga Ram Hospital, Lahore

**Duration of Study:** From 19<sup>th</sup> December 2008 to 18<sup>th</sup> June 2009

**Material and Method:** 580 patients selected from patients presented in Obstetrics and gynae unit-I and divided into 290 Anti HCV positive cases and 290 Anti HCV negative control subjects. Detailed history regarding past surgery, blood transfusion, D&C by untrained hospital setting and injectables by untrained persons outside hospital setting, taken and entered on specially designed proforma.

**Results:** 206 (71.03%) Anti HCV positive cases and 108 (37.24%) control subject has history of surgery in past while 84 (28.97%) cases and 182 (62.76%) control subjects did not have any history of surgery in past. Odd ratio was 41.60(20.69%) cases and 36 (12.41%) control subjects received blood transfusion at least three months back while 230 (79.31%) cases and 254 (87.59%) control subjects did not receive any blood transfusion in past. Odd ratio was 1.84. 138(33.79%) cases and 65 (22.41%) control subjects had history of D&C while 152(66.21%) cases and 225(77.59%) control subjects did not have any history of D&C by untrained persons outside hospital setting. Odd ratio was 3.1. 160(55.17%) cases and 150 (51.72%) control subjects had history of injectables (drips / injections) at least three months back by untrained persons outside hospital setting while 130 (44.83%) cases and 140 (48.28%) controls did not receive any injectables (drips / injections). Odd ratio was 1.15.

**Conclusion:** Past surgical history and history of D&C were the most important risk factors for transmission of hepatitis C infection among pregnant women.

**Key Words:** Hepatitis C, Associated factors, Pregnant women.

### INTRODUCTION

Hepatitis C is emerging as a major health problem world wide and is a leading cause of chronic liver disease, especially in third world countries<sup>1</sup>. World Health Organization (WHO) estimated about 170 million people, 3% of the world population is infected with hepatitis C virus<sup>2,3</sup>. It accounts for about 14.5% of acute viral hepatitis, 60-70% chronic hepatitis and up to 60% of cirrhosis and hepatocellular carcinoma<sup>4</sup>. The prevalence of HCV positivity in pregnant women ranges from 1.2% to 4.5% in developed countries<sup>5,6</sup>. Various studies have shown seroprevalence in Pakistan ranging from 0.7% - 20%<sup>7</sup> in general population while 3.27% in pregnant women<sup>8</sup>.

The prevalence of HCV in a population can be predicted by risk factors associated with transmission of infection<sup>9</sup>. Surgical procedures are

the most important risk factors for transmission of hepatitis C virus<sup>8</sup>. Hepatitis C infection is blood born but only 25% of the infected pregnant women indicate a history of blood or blood products transfusion or intravenous drug use<sup>10</sup>.

There is no association between vertical transmission of HCV and gestational age at delivery or presence of chorioamnionitis but use of scalp electrodes has been associated with vertical transmission of hepatitis C<sup>11</sup>.

Pregnancy is a stressful condition. Normal pregnancy is associated with series of dramatic haemodynamic changes but standard liver function tests remain normal during entire course except alkaline phosphatase which increases near term. Also, there is no alteration in structure or histology but if liver is infected like in cirrhosis or liver

function tests are deranged then it may cause problem during pregnancy and delivery<sup>12</sup>.

Liver function tests are required to assess the liver disease. These tests include aspartate amino transferase (AST) and alanine amino transferase (ALT), their levels indicate the liver cell injury or necrosis while serum albumin and prothrombin time shows cirrhosis or severe acute liver injury, as their levels are depressed in these conditions. In normal pregnancy, alkaline phosphatase level may be elevated three to four folds because of placental alkaline phosphatase level<sup>13,14</sup>.

Hepatitis C virus is a single stranded RNA virus of Flavi viridae family. Anti HCV is detected by enzyme linked immunosorbant assay( ELIZA) method. Patient with chronic hepatitis whose therapy can be delayed should not be treated with interferon during pregnancy due to lack of controlled studies available, however, women already on interferon treatment are allowed to continue pregnancy<sup>15,16</sup>. In patients with acute hepatitis C during pregnancy, the use of interferon therapy should be considered with close monitoring.

The infection by the hepatitis viruses when appears during pregnancy could result in damage to fetus, however, risk differ according to implicated virus. However, 50% of infected women have no risk to fetus. There is no evidence that natural history of HCV interfere with normal pregnancy unless the patient has cirrhosis with associated complications. On the average, around 5% HCV may be transmitted vertically ( with wide variation 0-30%), but transmission rate becomes very high in case of coinfection with HIV -1 and HCV viral load <sup>17</sup>.

Rationale of study is to find out the most significant risk factor for HCV positivity in pregnant patients so that strategies can be made to prevent its spread.

**RESULTS**

During study period of 6 months, 290 cases ( Anti HCV +ve pregnant women ) and 290 controls ( Anti HCV –ve pregnant women) were selected.

History of general surgery, obstetrical, gynecological and dental surgery was present in 206 (71.03%) Anti HCV +ve cases and 108 (37.24%) control subjects. 84(28.97%) cases and 182(62.76%) control subjects did not have any history of surgery in past. Difference was statistically highly significant with Odd ratio of 4.1( table 1).

60 (20.69%) cases and 36(12.41%) control subjects received blood transfusion at least three months back while 230 (79.31%) cases and 254 (87.59%) control subjects did not receive any blood transfusion in the past. The difference was statistically insignificant with Odd ratio of 1.84 ( table 2).

History of D&C by untrained person outside the hospital setting was present in 138( 33.79%) cases and 65(22.41%) control subjects while 152(66.21%) cases and 225(77.59%) control subjects did not have any history of D&C by untrained person outside the hospital setting. The difference was statistically found to be significant with Odd ratio of 3.14 ( table 3).

160(55.17%) cases and 150(51.72%) control subjects had history of injectables ( drips/ injections) at least three months back by untrained persons outside hospital setting while 130(44.83%) cases and 140(48.28%) controls did not receive any injectables ( drips / injections) at least three months back by untrained persons outside hospital setting. The difference was statistically found to be insignificant with Odd ratio of 1.15( table 4).

**Table 1:** Association of Past Surgical History among cases and control subjects

Past Surgery	Anti HCV+ve	Anti HCV -ve
Positive	206 (71.03%)	108 (37.24%)
Negative	84 (28.97%)	182 (62.76%)

Odd ratio: 4.1

**Table 2:** Association of Past History of blood transfusion among cases and control subjects

Past history of blood transfusion	Anti HCV+ve	Anti HCV -ve
Positive	60 (20.69%)	36 (12.41%)
Negative	230 (79.31%)	254 (87.59%)

Odd ratio: 1.84

**Table 3:** Association of Past History of D&C among cases and control subjects

Past History of D&C	Anti HCV+ve	Anti HCV -ve
Positive	138 (33.79%)	65 (22.41%)
Negative	152 (66.21%)	225 (77.59%)

Odd ratio: 3.14

**Table 4:** Association of Past History of injectables among cases and control subjects

Past history of injectables	Anti HCV+ve	Anti HCV -ve
Positive	160 (55.17%)	150 (51.72%)
Negative	130 (44.83%)	140 (48.28%)

Odd ratio: 1.15

## DISCUSSION

Pakistan is highly endemic for hepatitis C infection<sup>18,19</sup> and is among countries of low to middle socio economy where more than half of population is illiterate. Majority of cases under this study lacked knowledge about HCV and mode of its transmission which is comparable to the study conducted by Jeffery et al<sup>20</sup>.

Many studies were conducted in Pakistan during past few decades and guidelines for the prevention and control of hepatitis were formulated.<sup>21</sup> In spite of this, hepatitis C is becoming more prevalent in our population.

In this study, I have compared certain risk factors associated with transmission of hepatitis C virus in pregnant women including past surgical history, history of blood transfusion at least 3 months back, history of D&C by untrained persons outside hospital setting and history of injectables (drips/injections) by untrained persons outside hospital setting.

Past surgical history including general, obstetrical, gynaecological or dental surgery is highly significant factor for transmission of hepatitis C in my study comparable to a study conducted by Jaffery et al at Shifa International Hospital Islamabad which showed increase frequency of hepatitis C in patients having past surgical history, with Odd ratio of 4.96.<sup>22</sup> Similarly study conducted by Shirazi et al from Ziauddin Medical University Karachi revealed increased frequency of hepatitis C in surgical patients.<sup>23</sup>

While a study conducted by Nguyen VTT et al at Vietnam, did not show any significant association between HCV positivity and previous history of surgery, in contrast to my study.<sup>24</sup> The reason may be increased poverty & illiteracy, untrained persons doing surgical practices and use of unsterilized instruments in our country.

Hepatitis C virus infection is also transmitted by blood and blood products transfusion. As anaemia is very common in Pakistan, most of surgeries result in need of blood transfusion,

increasing incidence of hepatitis C virus transmission.

Different studies carried out in Pakistani blood donors have shown prevalence of hepatitis C 3.4 – 4%.<sup>25</sup> Another study which was carried out on 6000 healthy voluntary donors at Fatimid Blood Transfusion Center Multan, revealed prevalence of Hepatitis C 1.27%.<sup>26</sup>

In my study, 20.69% cases and 12.4% control subjects have a history of blood transfusion in past, comparable to a study conducted by Khawja NP et al which revealed history of blood transfusion in 17% patients.<sup>27</sup> While Khokhar N et al quoted history of blood transfusion in 42% cases which is not comparable to my study.<sup>28</sup>

Medical and surgical termination of pregnancy is a common practice and 22.41% controls had history of D&C by untrained persons outside hospital setting, in contrast to a study conducted by Jaffery et al which showed history of D&C in 9.7% cases and 1.6% control subjects.<sup>29</sup>

Use of contaminated syringes for injections had been identified as a leading risk factor for hepatitis C virus transmission in patients belonging to northern Sindh.<sup>30</sup> This could be explained by unlawful practices of used syringes being washed and packed for re-sale.<sup>31</sup> Medical practitioners in the private sector re-use syringes, and only change needle when it becomes blunt. It was estimated that about half of all injections administered in Pakistan involved re-used syringes.<sup>31</sup>

My study does not show any significant association between HCV positivity and history of injectables (drips/injections) by untrained persons outside hospital setting with Odd ratio of 1.15, comparable to a study conducted by Nguyen VTT et al at Vietnam, revealing no significant association between HCV positivity and history of injections.<sup>142</sup> The most probable reason is single use of syringes and practices of cutting needles immediately after use.

No doubt, hepatitis C infection is preventable and avoidable disease with serious implications. There is also an urgent need to expand, extend and standardize community based surveys regarding epidemiology, awareness standardize community based surveys regarding epidemiology, awareness and prevention strategies. It is recommended that routine screening for hepatitis C virus should be carried out in pregnant women; ensure proper sterilization of instruments at all levels of health care, in particular, primary health

care settings; proper sterilization of instruments used by traditional birth attendants as well as dental instruments used during dental procedures.

Health education and awareness of health care providers and population in general should be our main goal.

## CONCLUSION

Past surgical history and history of D&C by untrained persons outside the hospital setting were major risk factors for transmission of hepatitis C infection.

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