ORIGINAL ARTICLE

Comparison of outcomes among pregnant women with hepatitis C versus without hepatitis C

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Abstract

Objective: To compare outcomes among pregnant women with versus without hepatitis C

Study Design: Cohort study

Place and duration of study: Hamdard university hospital and a community based hospital at Karachi from September 2008 to August 2009.

Patients and Methods: Women attending antenatal clinics for the first time were screened for Hepatitis C and two groups were made. Exposed group consisted of eighty seropositive women and non exposed group consisted of eighty seronegative women, both the groups were followed till delivery. The variables of interest were intrauterine growth retardation, preterm labour, Apgar score at I min, birth weight, low birth weight babies, admission in NICU and perinatal death.

Results: Out of 160 pregnant women, mean age was 28.9±4.1years and 28.8±5.4 years of exposed and non-exposed respectively. The percentage of women admission to hospital was found to be 14.6% and 29.9% in exposed and non-exposed respectively. Cirrhosis of liver was found in 3.7% of exposed women only. The mean apgar score was 7.6±1.5 and 8.2±0.9 among exposed and non-exposed respectively. There was no significant difference in rest of the variables between the two groups.

Conclusion: In our study admission to hospital, cirrhosis and apgar score at I minute were the only risk factor found to associated in women with Hep C.

Key words: Hepatitis C virus infection, anti-HCV antibody, pregnancy, risk factors

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Introduction:

Globally, hepatitis C virus (HCV) is a leading health issue in developed and developing countries. As per World Health Organization (WHO) estimates this deadly virus effected 3% of the population worldwide.[1] The prevalence of this endemic blood borne virus varies in different parts of the world, ranging from around 1% of the population of Europe to 5.3% of the population of Africa and from 0.7% to 20% of the population of Pakistan with highest number of infections reported in Egypt from 17%-26%.[2-5] Among pregnant women the seroprevalence ranges from 1.2% to 4.5% in various countries of the world[6] in various local studies the prevalence in Pakistan was found to be 3.27%, 2.41% HCV RNA positive on PCR.[7-8]

Various local studies showed that the most significant risk factors for transmission of HCV infection in pregnant women are past history of surgical procedure (38.7%), blood transfusion (9.7%), delivery (64.5%), D&C (9.7%), Jaundice (21.7%) and dental surgery (43.5%).[7-9] It has been reported that in resource poor countries, the risk of iatrogenic HCV infection is high.[10]

There is little research regarding the impact of HCV on pregnancy outcomes. In a local study the mean birth weight of newborn and mean apgar score at 1 minute was found to be 3.092 kg and 7.71 respectively in HCV positive wom-

en. Among controls the mean birth weight and mean apgar score was 3.081 and 3.89 respectively. There was no adverse outcome found among HCV positive and negative mothers.[7]

HCV infection was associated with an increased risk of the infant being LBW, SGA, requiring NICU admission, and needing assisted ventilation. There were non-significant trends for low apgar score, prematurity, and neonatal jaundice being associated with HCV.[11]

This prospective study was designed to assess feto-maternal outcome, so that strategies could be made to overcome the morbidity if found.

Patients and Methods:

Permission from ethical review committee of the Hamdard University was taken for the study. A Cohort study was conducted from September 2008 to August 2009 on 160 pregnant women attending antenatal clinic. Eighty women who were found to be positive on screening for anti HCV antibodies on third-generation ELISA (Monolisa, anti-HCV Plus version 2, Bio-Rad, Marne-La-Coquette, France), confirmed on PCR, served as an exposed group and eighty women who were found to be negative for anti HCV antibodies served as a non-exposed group. The purpose and procedure of the study was explained to all the participants and informed consent was taken before inclusion in the study. The variables of interest were intrauterine growth retardation (IUGR), preterm labour, Apgar score at I min, birth weight, low birth weight (LBW) babies and admission in neonatal intensive care unit (NICU). Both the groups were followed till delivery and feto-maternal outcomes were determined. Intrauterine growth retardation was defined as weight less than 10th percentile for its gestational age. Preterm labour was defined as gestational age less than 37 weeks. Low birth weight was defined as weight less than 2.5 kg. Data was analyzed on SPSS version 15. Univariate anlysis was used to control effect modifiers, Relative Risk (RR) and 95% confidence intervals (95% CI) for outcomes associated with maternal HCV infection. Both the groups were compared using Chi square test for qualitative variables and t test for quantitative variables. P value ≤0.05 was taken as significant.

Results:

Demographics and general characteristics are given in table 1. The only notable finding among general characteristics between two groups was history of blood transfusion. The difference was statistically significant p 0.003, as shown in table 1. Apart from this variable the two groups were similar in demographics and general characteristics.

Outcomes of pregnancy in exposed and non exposed are shown in table 2. None of the maternal outcome showed any difference among exposed versus non exposed. As far as neonatal outcome are concerned only apgar score at 1 minute showed statistically significant difference, p 0.02.

Discussion:

In Pakistan the HCV seroprevalence ranges between 0.7% - 20% in general population.[4] Whereas, among the pregnant women the seroprevalence have found to be 3.27% and 2.41%.[7-8] The common known risk factors for transmission of HCV infection includes, age, parity, previous blood transfusion, dilatation & curettage (D&C), previous general surgery, dental surgery, cesarean delivery, jaundice and injection by quack are said to be responsible for HCV. Although this was not our objective but we also compared the general characteristics of two groups. In our cohort, the mean age of the two groups was similar, all of them were young and there was no difference noted. HCV seropositivity has been reported to increase until the age 40 and then declines over time.[12] The reason could be more the age the greater the chance of exposure to the risk factor. High mean parity have been found in HCV positive patients in a study conducted by Leikin et al.[13] In our cohort mean parity of the two groups was found to be similar.

Blood or its products were the main source of hepatitis C transmission, when the screening of blood transfusion was not started. The history of

Table 1: *Demographics and general characteristics of two groups (n=160)*

Characteristics	Exposed (n=80)	Non exposed (n=80)	P value
Age (mean±SD)	28.9±4.1	28.8±5.4	0.94
Parity (mean±SD)	2.7±1.7	2.6±1.6	0.58
H/o Blood Transfusion	26(32.9)	10(13)	0.003
Cesarean section	19(23.2)	22(27.6)	0.519
Previous surgery	18(22)	1(13.2)	0.15
Dental extraction	13(15.9)	14(16.9)	0.86
Jaundice	7(8.5)	6(7.8)	0.86

n, number, %in parantesis, SD, standard deviation

Table 2: *Outcomes of the study (n=160)*

Variables	Exposed (n=80)	Non exposed (n=80)	RR (95% CI)	P value
IUGR	10(12.5)	14(17.5)	0.81(0.49-1.34)	0.42
Preterm Labour	9(11.25)	10(12.5)	0.94(0.57-1.55)	0.69
Mean Apgar(1min)	7.6±1.5	8.2±0.9	-	0.02
Birth weight (kg)	2.84±0.4	2.88±0.5	-	0.54
LBW	10(12.5)	13(16.25)	0.85(0.52-1.39)	0.6
Admitted in ICU	19(23.75)	12(15)	1.30(0.93-1.81)	0.23

n: number, %in parantesis, SD standard deviation, CI confidence interval

blood transfusion was found to be more (32.9%) in HCV positive women as compared to control (13%) and this was statistically significant (Table I). This may be due to improper screening of blood and its product. The association of the same risk factor has been supported by various studies.[7-9]

Apart from history of blood transfusion the two groups were similar in other characteristics like previous history of cesarean section, dental extraction, surgery and jaundice and no association was observed among these factors with HCV positivity. Similar findings noted in an Indian study and found no association of the above mentioned risk factors.[14] In a local study only previous surgery was found to be associated with HCV positive status other risk factors found to have no association. This study also support the results of our study.[7]

Very few studies have been done on the outcome of pregnancy in women with and without HCV positivity. Therefore this prospective study was planned as the previous studies based on retrospective data collection.

Among the various maternal outcomes of interest in our study, none showed any difference between the two groups. There is no unfavourable effect of HCV on pregnancy and the same is supported by the various local and international studies.[7, 9,11-17]

Among the neonatal outcome there was significant difference noted in mean apgar score in HCV positive women as compared to HCV negative women. But this finding of ours was not supported by any local or international studies.[7,11] this difference could be due to small sample size. No significant association was noted in prematurity and IUGR. The same was observed in a other studies.[7-11]

There was no difference in the mean birth weight between the two groups in our study and the same is supported by a study conducted in Shifa International hospital Islamabad as well as by study conducted by Pergam SA, et al.[7-11] Similarly no difference was observed in LBW and admission to NICU. The same is supported by various studies.[17-19] On the contrary, in a study by Pergam SA, et al, HCV infection was associated with an increased risk of the infant being LBW and NICU admission.[11]

Few studies of HCV and pregnancy have ascertained pregnancy outcomes. Increased risks for obstetric complications associated with HCV infection have not been noted in previous studies, but these were limited by small sample sizes.[7,15,19]

The population-based cohort study using Washington state birth records from 2003 to 2005 showed that HCV appears to be associated with multiple adverse outcomes. However, the mechanisms for this increased risk are still not known.[11] Epidemiologically, HCV infection may be a surrogate marker for other high-risk behaviors or factors that could lead to increase risk of poor outcomes. Physiologically, vascular compromise of the placenta can lead to poor neonatal outcomes.[20-21] Because HCV can cause vasculitis, involvement of the placental vasculature could explain the growth retardation and higher risk of complications after delivery.

Pathologic examination of placental changes in women with HCV infection and further prospective evaluation of other cofactors on a large scale may help to explore risk factors of pregnancy associated with HCV.

Conclusion:

Overall no adverse maternal outcomes were noted. Mean apgar score at 1 minute showed a significant difference. History of blood transfusion was found to be the risk factor for transmission of hepatitis C.

References:

1. World Health Organization and Viral Hepatitis Prevention Board. Global surveillance and control of hepatitis C. J Viral Hepat. 1999;6:35–47.
2. WHO. Hepatitis C Fact Sheet No.164. [available on internet] 2000 [cited 2007 March] Available from: http://www.who.int.
3. Laurer GM, Walker BD. Hepatitis C infection. N Eng J Med. 2001;345:41-51.
4. Shah NH, Shabbir G. A review of published literature on hepatitis B and C virus prevalence in Pakistan. J Coll Physicians Surg Pak. 2002;12:368-71.
5. Wasley A, Alter MJ. Epidemiology of hepatitis C: geographic differences and temporal trends. Semin Liver Dis. 2000;20:1–16
6. Paternoster DM, Santarossa C, Stella A, Praise A, Palu G. Pregnancy in women infected with hepatitis C . Acta Biomed Ateneo Parmense. 2000;71:553-7.
7. Jaffery T, Tariq N, Ayub R, Yawar A. Frequency of Hepatitis C in pregnancy and pregnancy outcome. J Coll Physician Surg Pak. 2005;15:716-9.
8. Shaikh F, Naqvi SQH, Jilani K. Memon RAD. Prevalence and risk factors for hepatitis C virus during pregnancy. Gomal J Med Sci. 2009;7(2):86-8.
9. Haider G, Zehra N, Munir AA. Hepatitis C: Frequency, risk factors and pregnancy outcome. J Surg Pak (Int). 2009;14(1):34-7.
10. Hutin Y, Hauri A, Armstrong G. Use of injections in healthcare settings worldwide, 2000: literature review and regional estimates.BMJ.2003;327: 1073-8.
11. Pergam SA, Wang CC, Gardella CM, Sandison TG, Phipps WT, Hawes SE. Pregnancy complications associated with hepatitis C: data from a 2003-2005 Washington state birth cohort. Am J Obstet Gynecol 2008;199:38.e1-38.e9.
12. Stevens CE, Taylor PE, Pindyck J, Choo QL, Bradley DW, Kuo G, et al. Epidemiology of hepatitis C virus: A preliminary study in voluntary blood donors. JAMA. 1990;263:49-53.
13. Leikin EL, Reinus JF, Schmell E, Tejani N. Epidemiologic predictors of hepatitis C virus infection in pregnant women. Obstet Gynecol.1994;84:529-34.
14. Kumar A, Sharma KA, Gupta RK, Kar P, Chakravarti A. Prevalence & risk factors for hepatitis C virus among pregnant women. Indian J Med Res. 2007;126:211-5.
15. Jabeen T, Cannon B, Hogan J, Crowley M, Devereux C, Fanning L, et al. Pregnancy and pregnancy outcome in hepatitis C type 1b. Q J Med. 2000;93:597-601.
16. Hillemanns P, Langenegger P, Langer BC, Knitza R, Hasbargen U, Hepp H. Prevalence and follow-up of hepatitis C virus infection in pregnancy. Z Geburtsh Neonatol.1998;202:127-30.
17. Floreani A, Paternoster D, Zappalà F, Cusinato R, Bombi G, Grella P,et al. Hepatitis C virus infection in pregnanc. Br J Obstet Gynaecol. 1996;103:325-29.
18. Conte D, Fraquelli M, Prati D, Colucci A, Minola E. Prevalence and clinical course of chronic hepatitis C virus (HCV) infection and rate of vertical transmission in a cohort of 15,250 pregnant women. Hepatology. 2000;31:751–5.
19. Granovsky MO, Minkoff HL, Tess BH, Waters D, Hatzakis A, Devoid DE, et al. Hepatitis C virus infection in the mothers and infants cohort study. Pediatrics. 1998;102:355–9.
20. Redline RW. Severe fetal placental vascular lesions in term infants with neurologic impairment. Am J Obstet Gynecol. 2005;192:452-7.
21. Sander CM, Gilliland D, Akers C, et al. Livebirths with placental hemorrhagic endovasculitis: Interlesional relationships and perinatal outcomes. Arch Pathol Lab Med. 2002;126:157-64.