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Burden of HCV infection among pregnant women with assessment of risk factors and pregnancy outcome in HCV infected: A hospital based study from Uttarakhand

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Abstract

Introduction: *Hepatitis-C is a global health problem. Risk factors for HCV infection include intravenous drug use, transfusion of infected blood or blood products, unsafe therapeutic injections and surgical, dental procedures with improperly sterilized instruments. With rising incidence of HCV infection, a significant number of pregnant women are getting affected. However, there is little research regarding the burden and impact of HCV infection on pregnancy.*

Aim and Objectives: *The aim of the study was to evaluate burden and impact of HCV infection among pregnant women in a tertiary care centre of Uttarakhand. The objectives were to find out seroprevalence of Hepatitis-C among pregnant women, study the socio-demographic profile and risk factor profile of anti HCV positive pregnant women, to study the pregnancy outcome in anti HCV pregnant women and evaluate the need for universal antenatal screening for HCV infection.*

Material and Methods: *A retrospective hospital record based study of all pregnant women delivered in Dr. Sushila Tiwari Government Hospital, Haldwani between January 2014 and December 2015 was carried out. . All the pregnant women coming to the hospital are routinely screened for HCV infection as per standard protocol of the hospital. HCV status of all delivered patients was studied. A predesigned semi-structured proforma was used for collecting information regarding socio-demographic variables, risk factors and pregnancy outcome among anti-HCV positive women. Data collected was entered in MS excel and analyzed using Epi-info.*

Result: *Seroprevalence of Hepatitis-C among pregnant women was 0.89% in our study Among the risk factors studied, previous surgery and blood transfusion were found to be the important risk factors observed in16(25.80%) and 5(8.06%) of anti- HCV positive pregnant women. About 42 % of women had no identifiable risk factors. Pre term delivery was found to be the most common complication (33.8%) among the anti- HCV positive women. This was followed by Fetal Distress (14.51%), Pregnancy Induced Hypertension (P.I.H.), Ante- Partum Haemorrhage (A.P.H.) and Intra Uterine Fetal Death (11.29% each). About one -third of neonates (33.87%) born to anti-HCV positive mothers were premature at birth*

and 37.09% of neonates had low birth weight.
Conclusion: *Incidence of HCV infection is on the rise. HCV infection in pregnant women is associated with several adverse maternal and neonatal outcomes. Universal screening of all pregnant women should be done for HCV infection as at risk screening may miss significant proportion of pregnant women with HCV infection.*
Keywords: *Hepatitis C virus, Seroprevalence, Risk Factors, Pregnancy Outcome.*

INTRODUCTION

Hepatitis-C is a global health problem affecting 2-3% of world population. [(1)] Population based studies on prevalence of HCV infection in India are scarce. Blood bank data is the largest source of data on prevalence of HCV infection in India. Based on these data, prevalence of HCV infection in India has been variously estimated as 0.9 to 1.9 %. [(2,3)]. Prevalence of HCV among pregnant women ranges from 0.14 to 4.4% in developed countries [(4,5)] and from 0.6 to 1.4% in India [(6-8)]. Risk factors for HCV infection include intravenous drug use, transfusion of infected blood or blood products, unsafe therapeutic injections, sexual transmission, occupational (needle – stick) injuries or nosocomial transmission during healthcare related procedures such as surgery, haemodialysis and organ transplantation [(13)].

However, in 40% of cases, there are no identifiable risk factors. [(9)] Approximately 7-8%of anti-HCV positive pregnant women can transmit hepatitis-C virus to their offspring. [(10)] With rising incidence of HCV infection, a significant number of pregnant women are getting affected. However, there is little research regarding the impact of HCV on pregnancy outcome.

Though studies regarding seroprevalence patterns of HCV among blood donors have been undertaken in Uttarakhand in the past where seroprevalence was found to be 0.64% in Kumaon region [(11)] and 0.20% in Garhwal region [(12)], but those on the estimates of seroprevalence patterns and risk factors among pregnant women and impact of HCV infection on pregnancy outcome are yet to be done in Uttarakhand. Therefore, this hospital based study was aimed to evaluate the burden and impact of HCV infection among pregnant women admitted for delivery in the department of Obstetrics and Gynaecology of Dr. Sushila Tiwari Government hospital and Government Medical College, Haldwani. The objectiveswere to find out seroprevalence of Hepatitis-C among pregnant women, study the socio-demographic profile and risk factor profile of anti HCV positive pregnant women, to study the pregnancy outcome in anti-HCV pregnant women and evaluate the need for universal antenatal screening for HCV.

MATERIAL AND METHODS

A retrospective hospital record based study of all pregnant women delivered in the department of Obstetrics and Gynaecology of Dr. Sushila Tiwari Government Hospital and Government Medical College, Haldwani between January 2014 and December 2015 was carried out.The hospital is a tertiary care centre situated in block Haldwani of district Nainital of Uttarakhand. It provides antenatal and specialized obstetrics services to the population of the Kumaon region of Uttarakhand and neighbouring districts of Uttar Pradesh. All the pregnant women coming to the hospital are routinely screened for HCV as per standard protocol of the hospital. HCV status of all women delivered during the above mentioned period was studied. A predesigned semi-structured proforma was used for collecting information regarding socio-demographic variables, risk factors and pregnancy outcome among anti-HCV positive women.Ethical approval for the study was taken from institution ethical committee.

Data collected was entered in MS excel and analyzed using SPSS version 16.

RESULTS

Table 1 Distribution of anti-HCV positive women according to socio-demographic variables (n=62)

Socio-demographic variables	No.	%
AGE (Years)		
15 – 20	10	16.1
21 – 25	28	45.2
26 – 30	18	29.0
31 – 35	05	08.1
> 35	01	01.6
Mean (SD)	25.18 (4.29)	
PARITY		
Primipara	27	43.5
Multipara	35	56.5
RELIGION		
Hindu	32	51.6
Muslim	22	35.5
Sikh	08	12.9
RESIDENCE		
Rural	35	56.46
Urban	27	43.54
DISTRICT		
Udham Singh Nagar (Uttarakhand)	44	70.96
Rampur (Uttar Pradesh)	13	20.96
Nainital (Uttarakhand)	04	06.45
Bijnor (Uttrar Pradesh)	01	01.61

Table 2: Distribution of risk factors among anti-HCV positive pregnant women (n=62)

Risk factors	No.	%
Previous major surgery	16	25.80
Previous abortion	08	12.90
Previous Dilatation and Evacuation	07	11.29
Previous Blood Transfusion	05	08.06
None	26	41.93

Table 3: Maternal and neonatal outcomes among anti-HCV positive women (n=62)

Maternal outcome	No.	%
Pregnancy Complications		
Pregnancy Induced Hypertension (PIH)	07	11.29
Ante-Partum Haemorrhage (APH)	07	11.29
Anaemia	06	09.67
Oligohydramnios	05	08.05
Premature Rupture of Membranes (P.R.O.M.)	04	06.45
Preterm Labour	21	33.87
Fetal Distress	09	14.51
Intra Uterine Fetal Death (I.U.F.D.)	07	11.29
Mode of delivery		
Caesarean Section	39	62.9
Vaginal Delivery	23	37.1
Neonatal Outcome		
Prematurity	21	33.87
Low Birth Weight(<2.5 Kg)	23	37.09

Out of 6934 pregnant women who delivered during the study period, 62 tested positive for Hepatitis-C virus infection. Seroprevalence of Hepatitis-C among pregnant women was 0.89% in our study.

Mean age of anti-HCV positive women was 25.18 years. Majority of these women (45.2%) were in the age group of 21-25 years. Among anti-HCV positive women, 27 (43.5%) were primipara and 35 (56.5%) were multipara. 32 (51.6%) were Hindu, 22 (35.5%) were Muslim and 8 (12.9%) were Sikh. Of 62 HCV positive women 35 (56.46%) were from rural area and 27(43.54%) from urban area. Majority 44 (70.96%) of the anti-HCV positive women belonged to district Udham Singh Nagar and only 4(6.45%) belonged to district Nainital of Uttarakhand. (Table 1)

Among the known risk factors for transmission of HCV infection, 16 (25.8%) women had history of major surgery before the index pregnancy, 8 (12.9%) had history of previous abortion, 7 (11.2%) underwent Dilatation and Evacuation, 5(8.1%) received blood transfusion before the index pregnancy. None of the Anti-HCV positive women had history of Intra Venous Drug Abuse. About 42% of anti-HCV positive women had no identifiable risk factors. (Table 2)

Out of 62 HCV reactive women, 39 (62.9%) delivered by caesarean section and 23(37.1%) by vaginal route. (Table 3)

In our study, pre-term labour resulting into pre-term birth was found to be the most common complication (33.87%) among the anti-HCV positive pregnant women. This was followed by Fetal Distress (14.51%), Pregnancy Induced Hypertension (P.I.H.), Ante- Partum Haemorrhage (A.P.H.) and Intra Uterine Fetal Death (11.29% each). Other pregnancy complications were anaemia (9.67%) Oligohydramnios (8.05%) and Premature Rupture Of Membranes(P.R.O.M.) (6.45%) (Table 3)

About one -third of neonates (33.87%) born to anti-HCV positive mothers were premature at birth and 37.09% neonates had low birth weight (Table 3)

DISCUSSION

The seroprevalence of Hepatitis-C among pregnant women was 0.89% in our study which is comparable to the seroprevalence reported by Ashok et al (1.03%) [7] and Rudraparthy et al (0.6%) [6], but very low as compared to that reported by Farhana s. et al (3.44%) [13] and Goyal L.D. et al (2.8%) [14]. The estimated seroprevalence of HCV antibodies among pregnant women in India has ranged from 0.6 to 1.4% [6-8]

In our study, maximum number of anti-HCV positive women (45%) were in the 21-25 years age group which is similar to the findings of Goyal L.D.et al (45%) [14], Rudrapathy et al (52%) [6], Farhana et al (49%) [13] and Ashok et al (51.2 %) [7] In our study, the seroprevalence was found to be higher upto the age of 25 years and decreased after that. Our finding is similar to the findings of Ashok et al [7] and Goyal L.D. et al [14]. The highest prevalence of HCV infection occurs among individuals of reproductive age group [16,17]. Seropositivity has been found to increase upto the age of forty years and then decreases overtime. [18], this can be explained by the greater probability of exposure of these women to the risk factors for HCV infection.

Most of the Anti-HCV positive women (56.5%) in our study were multipara. Farhana et al [13], Ashok et al [7] and Goyal L.D [14] also reported higher seroprevalence among multipara. The multipara might be at a higher risk because of their past pregnancies, obstetric procedures and previous blood transfusion.

The present study found that more than half (56%) of the anti-HCV positive pregnant women were residing in rural areas.Goyal.L.D.et al [14] also found higher infection rates among rural residents

In our study, majority of anti-HCV positive pregnant women were from district Udham Singh Nagar (70.96%), and only 6.45% were from district Nainital. Our finding is consistent with the finding of Rawat v. et al [12] who also reported higher HCV prevalence (3.25%) among blood donors from district Udham Singh Nagar, whereas HCV prevalence among blood donors from district Nainital was only 0.23%.

Parenteral transmission is the most important route of transmission of HCV infection. Intravenous drug use is the predominant mode of transmission of HCV in several developed countries, however in developing countries, the main modes of transmission are transfusion of infected blood and its components and surgical, dental procedures with improperly sterilized instruments and unsafe therapeutic injections with reused syringes. 38% of HCV infection in India may be attributable to unsafe therapeutic injections [19]

In our study, past history of surgical procedures was found in majority of patients which is consistent with the findings of a study from Pakistan in which previous vaginal deliveries with episiotomy, previous surgeries, previous blood transfusion and Previous Dilatation and Curettage for abortion or Dysfunctional Uterine Bleeding were taken as independent variables, Only past history of surgical procedures was found to be the most important risk factor for transmission of H.C.V [20]

In present study, previous blood transfusion as important risk factor for transmission of HCV infection was observed in 8% of patients. Blood transfusion is also reported to be a major source of HCV infection in a study from Hazra, Pakistan [21]

Our study showed that about 42 % of anti-HCV positive women had no identifiable risk factors for HCV infection. This compares well with the observation that 40-73% of HCV positive women had no obvious risk factors for HCV infection. [9, 22,23,24)

Our study demonstrates that HCV infection in pregnant women is associated with several adverse maternal and neonatal outcomes. We found that about one-third pregnant women with HCV infection had pre-term labor. Studies evaluating prematurity with maternal HCV infection have contradictory results. A study from Canada found high rate of pre-term labor among anti-HCV positive pregnant women [25]. Some

other studies also found higher rates of pre-term labor among HCV infected women. [26, 27,28,29,30, 31] Two studies found no difference among HCV reactive women. [20, 32]

In our study, Premature Rupture of Membranes (PROM) was found in 6% of women. In one study, viraemia in anti-HCV positive mother was associated with Premature Rupture of Membranes. [33]

In present study 11.29% of anti-HCV positive women had pregnancy induced hypertension and antepartum haemorrhage. Our findings are consistent with the findings of Goyal L.D.et al [14] Latt et al also found higher rate of pregnancy induced hypertension among HCV RNA positive women. [33] .In a study Reddick et al found no association between HCV infection and pre-eclampsia, but the same study showed that individuals with Hepatitis-B and Hepatitis-C co-infection had increased risk for Antepartum haemorrhage. [30]

The present study reports intra uterine fetal deathin 11% anti-HCV positive women. This finding is similar to the finding of a study from British Columbia [25]

Because HCV infection can cause vasculitis, involvement of placental vasculature can lead to vascular compromise of placenta [34,35] which can explain poor neonatal outcome ranging from low birth weight, intra uterine growth restriction, birth asphyxia to stillbirth..There is paucity of data on neonatal adverse outcome associated with maternal HCV infection. Some of the studies quote similar neonatal outcome in HCV reactive and non-reactive mothers [36,37]. In present study, about 34% of neonates born to anti-HCV positive women were premature at birth and about 37% had low birth weight. Our finding is consistent with the findings of PergamS.A., WangC.C.etal [29]

Testing of at risk mothers for Hepatitis-C infection is advocated by both the Centres for Disease Control and Prevention [16] and American College of Obstetrics and Gynaecology[38]. Routine HCV screening of all pregnant women is not considered cost effective. [39] However ,at risk screening guidelines may miss significant proportion of pregnant women with HCV infection because upto 40% of pregnant women with Hepatitis-C infection have no identifiable risk factors [9] Secondly at risk screening is dependent on the health care providers having knowledge of risk factors for HCV infection as well as on women fully disclosing risk factors, Furthermore, such risk factors are under ascertained by healthcare providers during pregnancy. [40,41] So at risk screening may be inadequate [5]. Pregnancy provides an opportunity to identify early HCV infection because many who are found to be HCV positive are unaware of their serological status [42]

LIMITATIONS

The present study is a retrospective study based on the analysis of hospital data of anti-HCV positive pregnant women admitted in our hospital for delivery so information on some variables such as risk factors like tattooing, piercing of nose or ears, dental procedures, HCV status of spouse etc and neonatal outcomes other than prematurity and low birth weight could not be collected.

CONCLUSION

Incidence of HCV infection is on the rise. HCV infection in pregnant women is associated with several adverse maternal and neonatal outcomes. Pregnancy complications like Pre-term labour, Pregnancy Induced Hypertension, Antepartum Hemorrhage and intrauterine fetal death are common in anti- HCV positive pregnant women. Prematurity and low birth weights are the common adverse outcomes among the neonates born to anti-HCV positive women. Universal screening of all pregnant women should be done for HCV infection as at risk screening may miss significant proportion of pregnant women with HCV infection.

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