Original Article

Hepatitis B, C and Human Immunodeficiency Virus: Seroprevalence and Related Risk Factors in Pregnant Women

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Abstract

Objectives: to determine the seroprevalence and potential risk factors for hepatitis B (HBV), hepatitis C (HCV) and Human Immunodeficiency Virus (HIV) infections among pregnant women.

Study Design: cross-sectional study.

Place and Duration: it was carried out from 1 Jan 2014 to 31st May 2014 at Aziz Bhatti Shaheed Hospital Gujrat affiliated with Nawaz Sharif Medical College Gujrat.

Methodology: One thousand and thirty women, who attended the outpatient department for antenatal care, were included in the study. A proforma was filled by the attending doctor and blood sample was taken for screening of HBV, HCV and HIV by ELISA Technique at the first antenatal visit. Data was analyzed by statistical Package for Social Sciences version 16.

Results: Out of the 1030 women screened 109 (10.57%) were found to be positive for these viral infections, 26 (2.5%) for Hepatitis B virus, 63 (6.1%) for hepatitis C virus, 18 (1.7%) for human immunodeficiency virus and 2 (0.2%) had more than one infection. Among the sociodemographic factors education and residence had no effect on disease prevalence. Hepatitis C was more prevalent in multiparous women (n=53).Risk factors identified included use of frequent injections (for hepatitis B n=7, for Hepatitis C n=14 and for human immunodeficiency virus n=5), blood transfusion (n=16 for hepatitis C and n=7 for human immunodeficiency virus.) and previous surgery (n=23 for hepatitis C).

Conclusion: The overall prevalence of these viral infections is high. The risk factors included multiparity, frequent use of injections, blood transfusion and surgery.

Keywords: Hepatitis C, Hepatitis B, HIV, Prevalence, Risk Factors, Pregnancy.

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Introduction

Hepatitis B, hepatitis C and human immunodeficiency virus infections are a major burden to the health of people all over the world especially in developing countries. Approximately 1 in 12 persons or some 500 million people are living with chronic viral hepatitis. Viral hepatitis is among the top 10 infectious disease killers and a leading cause of liver cancer and cirrhosis.[1] An estimated 350 million and 170 million people are carriers of hepatitis B virus (HBV) and hepatitis C virus (HCV) world wide respectively.[2] World Health Organization estimates that about 34 million people (0.8%) are sufferers of human immunodeficiency virus (HIV).[3] The prevalence varies from country to country and at times it also varies among different regions of the same country.

Different studies conducted in Pakistan have shown prevalence of hepatitis B 2.6%-8% and Hepatitis C 0.4%-33.7% in general population, 0.34%-12.6% of hepatitis B and 3.3%-29.1% of hepatitis C in pregnant women.[4,5] Pakistan's first HIV/AIDS case was detected in 1987. The number has now increased and it is in "group of countries in transition".[6] The national adult HIV prevalence in general population is < 0.1% but exceptions are observed in Jalalpur Jattan (Gujrat).[7]

All these viruses share a common mode of transmission. The risk of parenteral transmission increases with use of unsterilized syringes for therapeutic injections, Sharing of needles among Iv drug abusers, transfusion of contaminated blood, surgical and dental procedures with infected instruments, use of infected needles for body tattooing, nose and ear piercing, sharing of razors by street barbers.[8-10] Sexual and vertical routes are important in transmission of hepatitis B and HIV.

Pregnancy may be the only time for clinical assessment in the female population, in limited resource settings like ours. Screening programs have their important role to prevent perinatal transmission of HBV and HIV infection and early referral for treatment. They also provide opportunity for screening of the family and to take measures for primary prevention. The risk of vertical transmission of HBV if the mother is in replicative status (HBe Ag positive) is 80-95% that can be reduced to 5-10% by active and passive immunization of newborn.[9] The risk of HIV transmission is 30-40% and that can be reduced to less than 2% with widespread use of Prevention of parent to child transmission of HIV (PPTCT) interventions that include antiretroviral drugs during pregnancy, caesarean section and avoidance of breast feeding.[11, 12]

This study aimed at determining the frequency of these viral infections in pregnant women and to determine the socio-demographic and other risk factors of the disease in our patients. Such data is useful for health planners and reinforces the need for establishing effective preventive programs that can lead to reduction in vertical and horizontal transmission of these viral diseases.

Methodology

It was a cross-sectional study conducted at Aziz Bhatti Shaheed Hospital Gujrat The pregnant women attending antenatal clinic of Obstetric Gynaecology teaching unit from 1st Jan 2014 to 31st May 2014 were included in the study. The study was approved by the ethical committee of University of Gujrat.

Written informed consent was taken from all the participants. The patients were interviewed on their first antenatal visit by the attending doctor to fill the pre-designed proforma. The blood sample was taken at the same visit for the investigations. Patients who refused the investigations were excluded from the study.

All the tests were done by ELISA technique. Those who tested positive were managed in collaboration with the physician. Those who tested positive for HIV were also referred to National Aids Control Program, and those referred from there for antenatal care were also included in study. The socio-demographic variables included in the study were parity, education and the place of residence. Other risk factors studied were history of blood transfusion, frequent injections, previous surgery and dental procedures.

Statistical analysis was performed by using the computer software statistical package for social sciences (SPSS) window version 16. The percentages of hepatitis B, hepatitis C and HIV positive cases were calculated. Those women that tested positive were analyzed for the presence or absence of risk factors (socio-demographic and other variables) by using Chi-square test and statistical significance was set at p value < 0.05.

Results

A total of 1030 patients were included in the study. The mean age of women was 28±1.7 Years. Out of these 361 (35%) were primigravida and 669 (65%) were multigravida. More women 754 (73.2%) belonged to rural area as compared to urban area 276 (26.8%). Regarding education status 405 (39.3%) were uneducated and 625 (60.7%) were educated.

The overall seroprevalence of all these viruses was found to be 109/1030 (10.57%). The frequency of HBV was 26/1030 (2.5%), HCV was 63/1030 (6.1%) and HIV was 18/1030 (1.7%). Two women (0.2%) were found to be carrying more than one infection. One was positive for hepatitis B and C and the other one for Hepatitis C and HIV.

Table I shows the effects of socio-demographic factors on disease prevalence. All the three viral infections were more prevalent in multigravidas 88/669(13.1%) as compared to primigravidas 22/361 (61%) but the effect of parity was statistically significant (53/669, p=0.001) in hepatitis C carriers. Pregnant women belonging to rural areas had more

Table I. Analysis of cases according to parity, residence and education (socio-demographic factors)

Risk factor	Total no. of cases n=1030	Hepatitis B positive		Hepatitis C positive		HIV positive	
		No of cases n=26(2.5%)	P-value	No of cases n=63(6.1%)	P-value	No of cases n=18(1.7%)	P-value
Parity:							
Primigravida	361(35%)	6(1.7%)	0.195	10(2.7%)	0.001	6(1.6%)	0.878
Multigravida	669(65%)	20(3%)		53(7.9%)		12(1.8%)	
Residence:							
Rural	754(73.2%)	19(2.5%)	0.988	50(6.6%)	0.254	16(2.1%)	0.13
Urban	276(26.8%)	7(2.5%)		13(4.7%)		2(0.7%)	
Education:							
Uneducated	405(39.3%)	10(2.5%)	0.197	29(7.2%)	0.26	10(2.5%)	0.155
Educated	625(60.7%)	16(2.6%)		34(5.4%)		8(1.3%)	

prevalence of these viruses but the effect did not reach to the level of statistical significance. The education status had no statistically significant effect although these viral infections were more prevalent in uneducated women 49/405 (12.1%) than educated women 58/625 (9.3%).

Among other risk factors studied, use of frequent injections 105/1030 (10.2%) was important regarding spread of HBV 7/105 (6.7% p=0.004), HCV 14/105 (13.3% p=0.001) and HIV 5/105 (4.7%, p= 0.012). History of blood transfusion was identified as a risk factor for spread of HCV 16/138 (11.5%, p=0.003) and HIV 7/138 (5%, p=0.001). Previous history of surgery also increased the risk of hepatitis C virus infection 23/229 (10%, p=0.005). There was history of dental procedures in 100 patients (9.7%). Although more percentage of seropositive patients gave history of dental procedures but that was not statistically significant. (Table-II)

Discussion

Viral infections are the major concern globally especially in resource poor countries. Worldwide many studies have been conducted to determine the prevalence of hepatitis B, C & HIV in their general population, in healthy blood donors and in pregnant women. Pakistan medical research council survey revealed an overall prevalence of HBsAg as 2.5% in general population.[13] This corresponds to the prevalence of HBV (2.5%) in this study. A study by Taseer IH et al.[10] has reported a higher prevalence in pregnant women of HBV (4.6%) at Nishtar Hospital Multan. The frequency of HBV in this study is less than that reported in Nigeria (6.5%) [14], Ethiopia (3.7%) [15], Sudan (5.6%) [16] and India (2.9%).[17] Higher prevalence of hepatitis B in pregnant women may be due to higher prevalence in their general population. The strong possibility of vertical transmission and presence of effective

Table II. Analysis of cases according to risk factors.

Risk Factors	Total no. of cases n=1030	Hepatitis B positive		Hepatitis C positive		HIV positive	
		No. of cases n=26 (2.5%)	P-value	No. of cases n=63(6.1%)	P-value	No. of cases n=18(1.7%)	P- value
Blood Transfusion:							
Yes	138(13.3%)	5(3.6%)	0.377	16(11.5%)	0.003	7(5%)	0.001
No	892(86.7%)	21(2.3%)		47(5.2%)		11(1.2%)	
Frequent Injections:							
Yes	105(10.2%)	7(6.7%)	0.004	14(13.3%)	0.001	5(4.7%)	0.012
No	925(89.8%)	19(2%)		49(5.3%)		13(1.4%)	
Previous Surgery:							
Yes	229(22.3%)	8(3.5%)	0.289	23(10%)	0.005	7(3%)	0.086
No	801(77.7%)	18(2.2%)		40(4.9%)		11(1.4%)	
Dental procedures:							
Yes	100(9.7%)	4(4%)	0.32	8(8%)	0.408	4(4%)	0.07
No	930(90.3%)	22(2.4%)		55(5.9%)		14(1.5%)	

immunization lends importance to diagnosing HBV infection in pregnant women and justifies antenatal screening.

HCV prevalence is higher in this study (6.1%) compared to Pakistan Medical and Research Council survey report[13] of 4.9% in general population.[18] reported a low prevalence (3.27%) that may be due to the fact that the study was conducted in people who were educated, had better socioeconomic status and were health conscious. Studies done by Taseer IH IH.[10] and Batool A.[19] has shown high prevalence rate of 7% and 7.3% respectively in different hospitals of Pakistan, that may be due to the regional variations or difference in method used to detect the disease.

The HIV prevalence rate in pregnant women was 1.7% in this study which is very high. Ghazala M et al.[20] has done a study on pregnant women with identifiable risk factors only and has shown a prevalence rate of 0.3% in them. No other study of HIV prevalence in pregnant women in Pakistan is available. Although this high prevalence is not the exact reflection of disease burden because the regional centre of National AIDS Control Program refers all HIV pregnant women to ABSH (as 9 patients were already under treatment at the centre) but it clearly shows that it's an emerging health issue in district Gujrat. The regional prevalence of HIV in sub-Saharan Africa is 4.9%, South and South East Asia is 0.3%, North America is 0.6% and western & central Europe is 0.2%.[3]

Regarding socio demographic risk factors, the effect of place of residence and education were not statistically significant .This is against the findings of Khattak et al.[21] according to which there is high prevalence of Hepatitis B & C in rural areas. Elsheik RM et al.[16] has also shown no significant relationship of education to HBsAg and Anti HCV prevalence, a finding similar to this study. All these viral infections were more frequent in multigravidas; the difference was statistically significant in HCV infection. The same is reported by Ugbebore O et al,[22] and Awan SN et al,[23] this may be because of their more exposure to iatrogenic risk factors due to previous deliveries, surgical procedures and need for blood transfusions in the past.

Our study has detected blood transfusion as a statistically important risk factor for transmission of HCV and HIV which has also been proven by other studies.[10, 19,20,24,25] Use of therapeutic injections for minor ailments is a common practice in Pakistan especially by quacks. This has been shown to be a significant factor for acquiring all three viral infections in this study as also supported by Taseer IH et al,[10] and Idrees et al.[25] Use of same syringe for injections should be strongly discouraged through health education of general public and mass media, to save our community from these deadly diseases.

In summarizing the carrier status of all these diseases, more number of positive Patients gave the history of previous surgery 38/229 (especially HCV positive women 23/229). This finding is also reported by Taseer IH et al,[10] and Jaffery T et al.[18] Dental manipulations were not detected as a major risk factor in this study or by some other studies.[16 22]

Further studies are required to detect other risk factors, for example sexual route is very important for HBV and HIV transmission. Nose and ear piercing which is a very common practice in our society also transmits these infections by use of same needle.

Conclusion

There is high frequency of hepatitis B and C viral infection in district Gujrat. HIV is also becoming an important health issue. Most important factors detected were use of frequent injections, followed by blood transfusion and surgery. The spread of disease can be minimized by increasing awareness among general public to restrict use of injections only where unavoidable and to ensure use of disposable syringes. Only properly screened blood should be transfused and strict protocols for sterilization of surgical instruments should be adopted.

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