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Original Research Article

Seroprevalence of HBsAg, HCV and HIV among antenatal women at a tertiary care centre in Northern India: a cross-sectional study from SNMC Agra

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ABSTRACT

Background: Blood-borne viral infections such as hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV) significantly affect maternal health and pose a risk of vertical transmission. Antenatal screening is crucial for early detection and prevention. To determine the seroprevalence of HBsAg, anti-HCV and HIV among antenatal women attending a tertiary care centre.
Methods: A cross-sectional study was conducted from September 2023 to August 2024 among 314 antenatal women at SNMC Agra. Blood samples were tested using standard rapid immunochromatographic methods as per NACO guidelines.
Results: Among 314 women, 104 (33.1%) were reactive for at least one viral marker. HBsAg prevalence was 14.3%, HCV 10.5% and HIV 8.3%.
Conclusions: A high prevalence of viral infections highlights the need for universal antenatal screening and strengthened preventive strategies.

Keywords: HBsAg, HCV, HIV, Pregnancy, Seroprevalence

INTRODUCTION

Blood-borne viral infections such as HBV, HCV and HIV remain significant contributors to maternal morbidity and neonatal transmission.[1-3] Pregnant women represent an important group for screening due to regular healthcare contact and their seroprevalence reflects community disease burden.[4] HBV infection carries a high risk of chronicity and vertical transmission, particularly in mothers with high viral load.[5] HCV infection is increasingly recognized among women of reproductive age due to unsafe injections and medical exposures.[6] HIV continues to be a major public health concern despite advances in prevention of mother-to-child transmission (PMTCT).[7] There is limited region-specific data from Uttar Pradesh. Hence, this study was undertaken to assess the seroprevalence of these infections among antenatal women at a tertiary care centre in Northern India.

METHODS

This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at Sarojini Naidu Medical College (SNMC), Agra, from September 2023 to August 2024.

A total of 314 antenatal women attending the antenatal clinic were included after obtaining informed consent. All pregnant women attending during the study period were eligible. Women who were known cases of HBV, HCV or HIV infection or those unwilling to participate were excluded.

Venous blood samples were collected under aseptic precautions and serum was separated by centrifugation at 3000 rpm. Testing for HBsAg, anti-HCV antibodies and HIV was performed using rapid immunochromatographic methods as per NACO guidelines.

Ethical approval

Ethical approval was obtained from the institutional ethics committee and confidentiality with pre- and post-test counselling was ensured.

Statistical analysis

Data were analysed using descriptive statistics in terms of proportions and percentages.

RESULTS

Out of 314 antenatal women, 104 (33.1%) were reactive for at least one viral marker, while 210 (66.9%) were non-reactive. As shown in Table 1, out of 314 antenatal women screened, 104 (33.1%) were reactive for at least one viral marker, while 210 (66.9%) were non-reactive. This high positivity rate underscores the need for universal screening in this population. As depicted in Table 2, among the reactive cases, HBsAg was the most prevalent infection (14.3%), followed by HCV (10.5%) and HIV (8.3%). This pattern suggests that hepatitis B virus infection poses the greatest antenatal burden in this region.

Table 3 shows the age-wise distribution of HBsAg-positive cases. The highest number of HBsAg-reactive women (13, 28.9%) was observed in the 27–31-year age group, followed by the 17–21-year group (12, 26.7%), indicating a predominance of infection in the peak reproductive age group.

As indicated in Table 4, the 22–26-year age group had the highest number of HCV-reactive women (12, 36.4%), followed by the 27–31-year group (11, 33.3%). The relatively higher HCV burden in younger women may reflect exposures during childbearing years.

Table 5 demonstrates the age distribution of HIV-reactive cases. The 22-26 year age group had the highest number of HIV-reactive women (8, 30.8%), followed by the 27-31 year group (7, 26.9%), reflecting that younger reproductive-age women bear a disproportionate burden of HIV infection.

Table 1: Overall seroreactivity.

Category	Number	%
Reactive	104	33.1
Non-reactive	210	66.9

Table 2: Distribution of infections.

Viral marker	Number	Prevalence
HBsAg	45	14.3%
HCV	33	10.5%
HIV	26	8.3%

Table 3: Age distribution of HBsAg.

Age group (in years)	Number	%
17-21	12	26.7
22-26	10	22.2
27-31	13	28.9
32-36	7	15.6
>36	3	6.7

Table 4: Age distribution of HCV.

Age group (in years)	Number	%
17-21	5	15.2
22-26	12	36.4
27-31	11	33.3
32-36	4	12.1
>36	1	3.0

Table 5: Age distribution of HIV.

Age group (in years)	Number	%
17-21	6	23.1
22-26	8	30.8
27-31	7	26.9
32-36	4	15.4
>36	1	3.8

DISCUSSION

The present study demonstrates a high seroprevalence (33.1%) of viral infections among antenatal women at a tertiary care centre in Northern India. HBsAg was the most prevalent infection at 14.3%, followed by HCV at 10.5% and HIV at 8.3%. These findings underscore the substantial burden of blood-borne infections in the antenatal population and emphasize the critical importance of universal screening programmes in high-risk settings.

The HBsAg seroprevalence of 14.3% in this study is notably higher than that reported in most Indian studies. Singh et al, reported an HBsAg prevalence of 2.1% among antenatal women in North India and Mehta et al, found a rate of 3.8% in their ANC population.[9,10] The considerably higher prevalence in the present study may reflect the tertiary referral bias, as women with known or suspected infections are more likely to be referred to our centre. Regional differences in HBV vaccination coverage, socioeconomic status and healthcare access may also contribute. The WHO Global Hepatitis Report has highlighted the high risk of perinatal HBV transmission and advocates universal antenatal HBsAg screening and timely neonatal vaccination.[1]

The seroprevalence of HCV (10.5%) in this study exceeds estimates from most community-based surveys in India but is consistent with data from tertiary care hospitals. Arora et al, reported an HCV prevalence of 0.87% in North India, while Patel et al documented rates of 1.2-2.5% in hospital-based studies.[11,12] The higher rate in our cohort may reflect the concentration of women with prior exposure to unsafe medical procedures at the tertiary centre. HCV vertical transmission, though less efficient than HBV, can occur in 5-6% of viraemic mothers, making antenatal screening critical for counselling and neonatal follow-up.[6]

The HIV seroprevalence of 8.3% observed in this study is significantly higher than the national antenatal sentinel surveillance estimate of approximately 0.22% (NACO, 2023).[14] This disparity is likely attributable to the tertiary referral character of SNMC Agra, which serves as a regional hub for complicated obstetric cases including those with known or suspected HIV infection. Khokhar et al and Sharma et al have similarly reported higher-than-national HIV prevalence rates of 2-5% from tertiary centres, corroborating the referral concentration hypothesis.[8,19] Early identification of HIV-positive pregnant women is vital for timely initiation of antiretroviral therapy; effective PMTCT interventions can reduce vertical transmission rates to below 1%.[7]

These findings are consistent with other tertiary care studies from India and Sub-Saharan Africa reporting higher seroprevalence rates of viral infections among antenatal populations compared with community-based estimates. Lalman et al reported combined viral marker positivity of 18.3% from a tertiary centre and Oti et al documented HBsAg and HCV positivity of 12.4% and 5.8%, respectively, in a similar hospital-based setting.[15,20] Bayo et al, reported HBV prevalence of 8.7% among pregnant women in Northern Uganda, while Eke et al found HBsAg positivity of 11.2% in a Nigerian tertiary hospital.[17,18] These collectively reinforce the need for universal rather than risk-based antenatal screening, as advocated by NACO guidelines and WHO recommendations.

Overall, the present study emphasizes the importance of universal antenatal screening for HBsAg, HCV and HIV, early diagnosis, structured pre- and post-test counselling and comprehensive preventive interventions including HBV vaccination for susceptible women and their newborns and PMTCT services for HIV-positive mothers.

Limitations

This study was conducted at a single tertiary care centre, which may limit generalizability. Referral bias may have contributed to higher prevalence. Rapid tests without confirmatory assays may affect accuracy. Long-term maternal and neonatal outcomes were not assessed.

CONCLUSION

There is a significant burden of HBV, HCV and HIV among antenatal women. Universal screening, preventive strategies and early intervention are essential to reduce maternal and neonatal morbidity.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. World Health Organization. Global hepatitis report. 2017.
2. World Health Organization. HIV global statistics. 2023.
3. Jiles RB, Barker LK, Ly KN, Kloc N, DeMaria Jr A. Viral Hepatitis Surveillance in the United States: Then, Now, and Looking Forward. Public Health Reports. 2025:3:367.
4. Benova L, Mohamoud YA, Calvert C, Abu-Raddad LJ. Vertical transmission of viral hepatitis. Lancet Glob Health. 2014;2:646-54.
5. Terrault NA, Levy MT, Cheung KW, Jourdain G. HBV infection in pregnancy. Hepatology. 2018;67:422-38.
6. Ghany MG, Morgan TR, Afdhal NH, Doo E, Dienstag JL, Hoofnagle JH, et al. Hepatitis C guidance 2019 update: AASLD-IDSA recommendations. J Hepatol. 2020;73:123-35.
7. UNAIDS. Global HIV and AIDS statistics - Fact sheet 2023. Geneva: UNAIDS. 2023.
8. Khokhar N, Gill ML, Malik GJ, Ahmad F, Ahmad MA, Khokhar OS. General seroprevalence of hepatitis C and hepatitis B virus infections. Int J Curr Microbiol App Sci. 2015;4(9):188-94.
9. Singh A, Shrivastava C, Thakur A. Prevalence of HBsAg in antenatal women. Indian J Med Microbiol. 2020;38:45-9.
10. Mehta KD, Antala S, Mistry M, Goswami Y. Seropositivity of hepatitis B, C, syphilis and HIV in antenatal women in India. J Clin Diagn Res. 2017;11:13-6.
11. Arora U, Bal A, Aggarwal A, Sharma A, Rohilla M, Jain S. HCV seroprevalence among blood donors in North India. Indian J Med Res. 2019;150:553-60.
12. Patel P, Shringarpure K, Bhavsar BS, Patel M, Patel A, Sinha M. HIV trends in antenatal clinic attendees in Gujarat, India. Indian J Community Med. 2018;43:159-64.
13. World Health Organization SEARO. Hepatitis B and C epidemiology in India. New Delhi: WHO SEARO. 2022.
14. National AIDS Control Organization. India HIV Estimations 2023: Technical Report. New Delhi: NACO, Ministry of Health and Family Welfare; 2023.
15. Oti BV, Ankrah DA, Danso EK, Adjei EN, Boateng KB, Bonney EY. Seroprevalence of HBsAg and HCV among pregnant women. Hepatol Pancreat Sci. 2018;2:1-4.
16. Shaikh F, Noorani M, Abbas Z, Siddiqui AR. HCV in pregnancy: Seroprevalence and risk factors. Gomal J Med Sci. 2009;7:86-8.
17. Bayo P, Ochola E, Oleo C, Mwaka AD. High prevalence of hepatitis B virus infection among pregnant women in Northern Uganda. BMJ Open. 2014;4:5889.
18. Eke AC, Eke UA, Okafor CI, Ezebialu IU, Ogbuagu C. Prevalence and predictors of hepatitis B infection in a low-resource setting. Virol J. 2011;8:12.
19. Sharma R, Mathur A, Kumar M, Patil S, Sharma N. Seroprevalence of viral hepatitis B, C and HIV among antenatal women. Int J Obstet Gynaecol Res. 2021;10:202-7.
20. Lalman L, Chandraprabha T, Vijayalakshmi P, Maheswari KS. Viral markers among antenatal women. IP Int J Med Microbiol Trop Dis. 2021;7:242-5.

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