

“Seroprevalence of Hepatitis B Surface Antigen, Antibodies to the Hepatitis C Virus, and Human Immunodeficiency Virus at a Tertiary Care Centre, Kanpur-A Retrospective Study”

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Abstract:

Introduction: Hepatitis B, hepatitis C, and HIV infections are a serious global and public health problem. To assess the magnitude and dynamics of disease transmission and for its prevention and control, the study of its seroprevalence is important.

Aim: This study was undertaken to estimate the seroprevalence of hepatitis B surface antigen (HBsAg) and antibodies to hepatitis C (anti-HCV Ab) and human immunodeficiency virus (anti-HIV Ab) in a tertiary care hospital, Kanpur India.

Material and Methods: This was a retrospective study conducted in the Department of Microbiology, Rama Medical College, Hospital & Research Centre, Mandhana, Kanpur, for a period of 1 year. Study period= Jan.1st 2021 to Dec. 31st 2021. The data of viral markers was retrieved from Medical Record and Hospital Information System over a period of 12 months from patients attending OPDs and admitted to various IPDs within the hospital-based lab for the detection of HBsAg and anti-HCV Antibodies and anti-HIV Antibodies using rapid card tests and further confirmation of all reactive samples by a micro particle enzyme immunoassay (Erba Lisa by Transisia, Biomedical Ltd)

Results: The seroprevalence of HBsAg was found to be 3.85%, of anti-HCV Ab as 3.51%, and of anti-HIV Ab as 0.34%.

Conclusion: The study throws light on the magnitude of viral transmission in the community (Hepatitis B Virus) infection is showing an increasing trend and the HCV (Hepatitis C Virus) infection, a fluctuating trend. Attempt should be made to reduce the incidence of HBV and HCV by simple preventive measures like public education, screening of blood and blood products, increasing public awareness about importance of vaccination for HBV.

Key words: Vaccination, Viral Hepatitis, Hepatitis B Virus, Hepatitis C Virus, Human Immunodeficiency Virus..

Introduction

Hepatitis B Virus (HBV) is a highly infectious and can be transmitted by percutaneous routes and by blood transfusion. The Hepatitis B surface antigen [HBs Ag] in the serum is the 1st seromarker to indicate Active HBV infection either Acute or chronic [1] This infection is the leading cause of morbidity and mortality, not only because of acute illness but also due to its chronic sequel like chronic hepatitis, cirrhosis of liver and hepatocellular carcinoma accounting for more than a million deaths worldwide [2] An effective vaccine available for over 2 decades has brought about a remarkable change in the global epidemiology of HBV infection among the viral hepatitis strains: [3] Hepatitis C virus is dangerous as its morbidity rate is high as it establishes a state of chronic infection in acutely infected patients [4] The major channels of HCV transmission are all related to exposure to blood and blood products. The presence of anti-hepatitis C virus antibody [Anti HCV Ab] indicates previous

exposure to hepatitis C virus [5] The HIV/AIDS is one of the largest public health crises of the 21st century. In India, the predominant mode of HIV transmission is through heterosexual contact. [6] To understand and assess the magnitude and dynamics of transmission of a disease in a Community and for its control and prevention the assessment and study of its prevalence is very important. India has a strong private health care system that caters to more than one-half ambulatory and two thirds outpatient care [7] As a result, a large amount of clinical information is available in a private health care setting. A private hospital thus represents an important center for serological surveys. [8]

Thus, the present study was undertaken to estimate the seroprevalence of HBs Ag and antibodies to hepatitis C & HIV in both the sexes and different age groups in a hospital-based study in Kanpur, Uttar Pradesh.

Material and Methods

Setting: This study was carried out in the serology section of the Department of Microbiology in Rama Medical College, Hospital & Research Centre Mandhana, Kanpur Uttar Pradesh.

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Patients and period of study

Patients who registered at the OPD's and patients admitted to the IPD's of this private hospital who had undergone HIV & HCV antibody testing and Hepatitis B surface antigen screening were included our study: The study extended over a period of 12 months from Jan 1st 2021 to Dec 31st 2021.

Specimen collection

A 5ml venous blood sample was collected from all patients who came to the hospital-based lab requisitions for the testing of HBS Ag, HCV & HIV antibodies. The Blood was allowed to clot for 45 mins at room temperature and the blood serum was separated after centrifugation at a low speed. The Serum sample was then subjected to requested tests.

Serological Sample Proceeding

The serum was tested for HIV anti-bodies using a rapid card test and further confirmation of all reactive samples by a micro particle enzyme immunoassay (Erba Lisa by transisia, Biomedical Ltd.) The serum was tested for HBsAg and antibodies to HCV were tested using a rapid card methods and further confirmation of all reactive samples by a micro particle enzyme immunoassay (Erba Lisa by Transisia, Biomedical Ltd.) The entire test was performed in accordance with the manufacturer's guidelines with adequate controls.

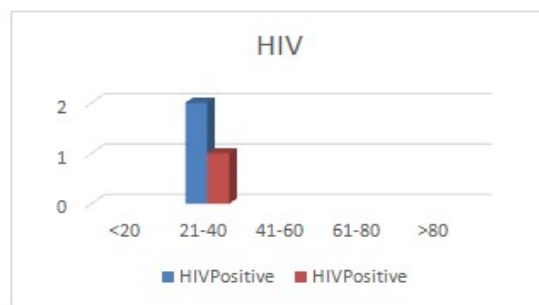
Statistical Analysis

Data was recorded using Microsoft Excel 2007 on a predesigned performs. The seroprevalence was obtained after calculating total number of positive and negative cases in our study.

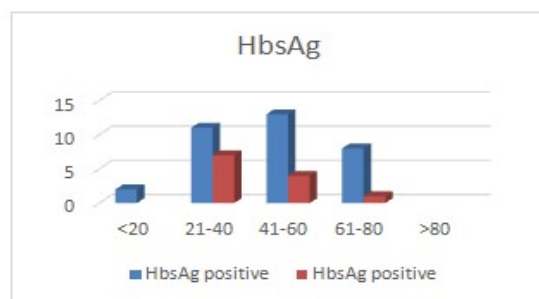
Results

A total of 6840 samples were tested for HBsAg, anti-HCV and anti-HIV antibody during 1 year study that is from period of January 2021 to December 2021. Out of 6840 samples tested 264 samples were positive for HBsAg with a seroprevalence of 3.85% which was found maximum in the age group of 41-60 years in male's and 21-40 years in females. Similarly, out of 6840 samples tested 240 samples turned out to be positive for anti HCV antibodies with a seroprevalence of 3.51% which was found maximum in the age group of 41-60 years in males and 41-60 years in females. And out of 6840 samples tested 23 samples turned out to be positive for anti-HIV antibodies with a seroprevalence of 0.34% which was found maximum in the age group of 21-40 years in males and 21-40 years in females. Thus, it was observed that the seroprevalence for HBV, HCV and HIV viruses was maximum for the same age group in both sexes with a gradual increase in the HBV

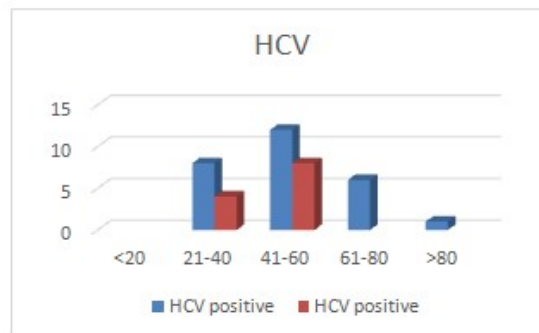
prevalence while HCV showing a slight fluctuating trend.



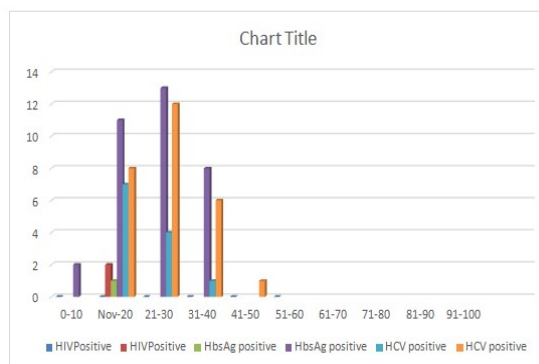
[Graph -1] Shows age wise distribution of HIV.



[Graph- 2] Shows age wise distribution of HbsAg.



[Graph-3] Shows age wise distribution of HCV



[Graph-4] Shows total cases of HIV positive Males and Females, Hbs Ag positive Males and Females, HCV positive Males and Females.

Discussion

HBV and HCV virus infections are characterized by a high global prevalence with complex clinical course and limited effectiveness of currently available antiviral therapy. As these viral infections are of serious public health problems worldwide and major causes of chronic hepatitis, liver cirrhosis and hepatocellular carcinoma. [9, 10].

Table No.1: Comparison of HBsAg with other studies.

S No	Author	Year	State	Study
1	Tripathi PC et al [11]	2015	Telangana	Hospital based
2	Baitha B et al [13]	2017	Jamshedpur	Blood donor
3	Khan AA [12]	2018	Telangana	Hospital based
4	Present study	2022	Kanpur	Hospital based

The present study shows prevalence rate of HBsAg to be 3.85% in contrast with the study carried out in 2015 by Tripathi PC et al., and less than the study which was similar to the study done by other authors in 2015; 2017 and less than the study where it was 44.94%.

Table No 2: Comparison of anti HCV with other studies.

S No	Author	Year	State	Study	%
1	Antony J et al [14]	2014	Kerala	Hospital based	0.85%
2	Khan AA [12]	2018	Telangana	Hospital based	9.78%
3	Ray K et al [15]	2018	West Bengal	Blood donor	0.83%
4	Present study	2022	Kanpur	Hospital based	3.51%

The present study shows prevalence rate of anti HCV to be 3.51% which is in support to the study by other authors.

Table No 3: Comparison of antiHIV with other studies

S. No	Author	Year	State	Study	%
1	Dimple Arora et al[16]	2006	Haryana	Blood donor	0.30 %
2	Nikita sherwani et al [17]	2015	Maharashtra	Hospital based	3.20 %
3	Present study	2022	Kanpur	Hospital based	0.34 %

In the present study the prevalence rate of anti-HIV was 0.34% which is in accordance with the study performed by Dimple Arora et al;

The present study also shows that out of 6840 samples tested for HBsAg, Anti HCV, Anti-HIV showed 264 samples positive with HBsAg in the age group of 41-60 years for males and 21-40 years in females with seroprevalence of 3.85%, 240 samples positive for Anti HCV in the age group of 41-60 years males and 41-60 years in females with seroprevalence of 3.51% and 23 samples positive for Anti-HIV in the age group of 21-40 years in males and 21-40 years in females with seroprevalence of 0.34%.

In this study slightly male predominance was observed for HIV infection with 13 males and 10 females similarly for HBV infection with 164 males and 100 females and HCV infection with 150 males and 90 females.

The reasons for the slight male predominance are may be due to more chances of exposure of males to risk factors.

As mentioned above, there is a wide variation in the prevalence and trend of hepatitis B and C infections which may be due to host and environmental factors, cultural and behavioral practices of specific regions. Promiscuous sexual practices, increasing trend of tattooing and sharing of needles among drug users and absence of effective vaccination for HCV are other reasons for its prevalence.[18]

Limitation

Present data is lacking important variables such as risk factors, epidemiological details, and outcome of the patients. Though the observed results in the present study reflects the patient population served by our hospital may not exactly apply to the community but may reflect to some extent the seroprevalence in Kanpur, tertiary care centre because of the large number of cases investigated.

Conclusion

Prevalence of HBV, HCV and HIV in this study was 3.85%, 3.51% and 0.34% respectively. HBV infection shows an increasing trend and the HCV infection a

fluctuating trend. Therefore, attempt should be made to reduce the incidence of HBV and HCV infection by using simple preventive measures like public education, screening of blood and blood products, increasing public awareness about importance of vaccination.

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