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Sero prevalence of Hepatitis B surface antigen, antibodies to Hepatitis C, & HIV in a hospital based population

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Abstract

Background: HBV, HCV, HIV infections are serious global and public health problems, affecting millions of population. Epidemiological studies worldwide show wide variations in the prevalence patterns of the HIV, Hepatitis B and the Hepatitis C Virus infections. Prevalence of these infections may differ not only from country to country but also different regions of same country. The present study was designed to find the seroprevalence of HBV,HCV, HIV infections in our area.

Methods: A retrospective study was conducted from August 2013 to March 2014.A total of 2851 subjects who were screened for Hepatitis B surface Antigen (HBsAg), anti HCV antibodies and anti HIV antibodies are included in study irrespective of their age & sex. Data was analysed on the basis of socio demographic factors & serological results .The results were analysed by Chi-square statistics.

Results: The seroprevalence of HBsAg was 2.42%, anti HCV anti bodies was 0.59% , anti HIV antibodies was 1.82% whereas, co infection i.e.,HBsAg with HIV was seen in 0.07% of study population.

Conclusion: In the present study, the seroprevalenc of HBV was higher than other two infections. As HBV was one of the dreadful infection, to limit the further spread & control the prevalence rates, population based screening programmes are recommended.

Keywords: Hepatitis B Virus (HBV) , Hepatitis C Virus (HCV), Human immunodeficiency virus (HIV), Seroprevalence, Coinfection.

Introduction

Infection with Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV),is a global health problem. Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human immunodeficiency virus (HIV), co-infection has emerged as a leading cause of morbidity due to liver disease throughout the world in the last two decades (1, 2). Among the HIV infected patients, HBV and HCV co-infections are more prevalent due to overlapping transmission routes (3). Consequently, the importance of co-morbidities such as chronic liver disease due to HBV and HCV infection is being recognized as significant problems. Epidemiological studies worldwide show wide variations in the prevalence patterns of the HIV, Hepatitis B and the Hepatitis C Virus infections. In co-infection, the presence of one virus impacts the natural

history of the other virus. HIV accelerates the natural course of HBV and HCV infections and facilitates faster progression of liver disease to cirrhosis and hepatocellular carcinoma. Disease progression to cirrhosis in HIV reactive patients is almost three-times faster as compared to HIV non reactive patients (4).Understanding HBV and HCV co-infection with HIV is particularly important in Asian countries due to high background prevalence of HBV and HCV(5). Sero-surveys are one of the primary methods which can be used to determine the prevalence of HBV and HCV, as they give an idea about the prevalence of these diseases in the community and help in the creation of long-term strategies to improve the public health and to prevent spreading of the disease in the local population(6). Only proper selection of the sensitive screening tests, adequate quality control measures and effective inactivation procedures can ensure the elimination, or at least reduction of the risk of acquiring transfusion transmitted infections (6). Study of prevalence is important to understand & assess magnitude of disease in community, and to plan better control & prevention strategies. The present study was undertaken with the objective to assess the presence of HBV, HIV HCV , & HBV & HIV co-infection in patients attending a Tertiary care centre in Guntur.

Material & Methods

Study design: This study was carried out in the Serology Section of the Department of Microbiology, after an approval from the institutional ethical committee. HIV antibody detection was performed only after pretest counseling and informed consent of the patient. Reactive results of HIV antibody testing were disclosed only after post test counseling.

Patients and period of the study

Patients who registered at the OPDs or admitted to the IPDs of this private hospital are advised to undergo HIV and HCV antibody testing and hepatitis B screening were included in the study. The study was done over a period of eight months from August 2013- March 2014.

Specimen

Five millilitres of venous blood sample was collected from all patients who came with laboratory requisitions for the testing of HBsAg, HCV, HIV antibodies. The blood was allowed to clot for 45 minutes at room temperature and the serum was separated after centrifugation at a low speed. The serum sample was then subjected to tests.

Serology

Serum collected was tested by using standard recommended procedure. HBsAg was determined by using a rapid card method Hepacard (Biomed industries), HCV by HCV Tridot (Biomed industries), HIV by HIV Tridot (Biomed industries). All the tests were performed in accordance with the manufacturer's instructions with adequate controls. Samples testing reactive are further rechecked by Enzyme linked immunosorbent assay (ELISA).

Statistical analysis: SPSS software version 16 was used for the statistical analysis. Chi-square test at significance level of 0.05 was used for testing the association between demographic parameters and presence of various infections and co infections.

Result

Out of 2851 samples, 138 (4.84%) were total sero-positive cases (Fig 1). Hepatitis B surface antigen was positive in 69 cases (2.42 %) among which 48 were Males and 21 were females. Hepatitis C Virus was positive in 17(0.59 %) of which 11 were males and 06 were females (Table 1). Out of 11 males among HCV positive eight patients were above 50 yrs. HIV1 was reactive in 52 (1.82 %) of which 32 were males and 20 were females. None were

reactive for HIV2. Coinfection in the form of HBV & HIV was seen in two male patients [Tables 2, 3, 4, 5 /Fig-2]. None of the samples were positive for Coinfections like HBV+HCV and HCV+HIV. Among the total Sero positive cases, majority were of the age group of 21 to 50 years except HCV. Among 11 male sero positive cases of HCV eight were in age group of above 50 yrs.

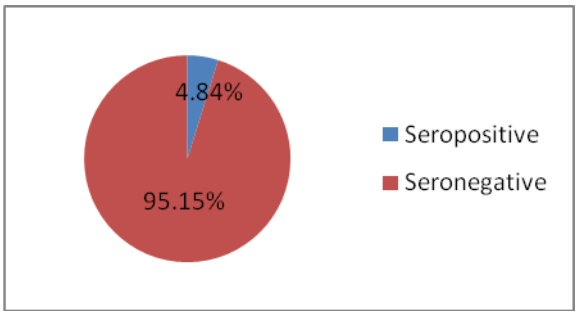

Fig 1: Total Sero positivity of HIV,HBV,HCV and HIV+HBV (n=2851)

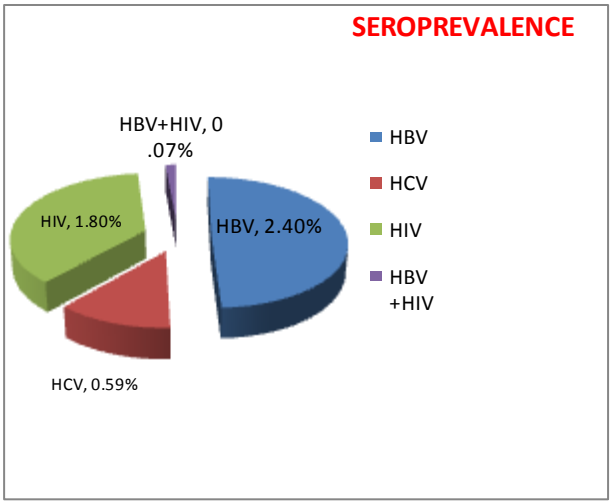

Fig 2: Total seroprevalence

Discussion

The prevalence of these viral infections varies from country to country and depends upon a complex mixture of behavioral, environmental, and host factors. In general, it is lowest in countries or areas with high standards of living (e.g., Australia, North America, and North Europe) and highest in countries or areas with low socioeconomic status (e.g., China, Southeast Asia, South America, and Africa) [7].

Analysis of our results revealed that out of 2851 individuals screened 138(4.84%) of them were

Positive for any one of the infections like HIV, HBV, HCV.

According to WHO India has been placed into the intermediate Zone of prevalence for Hepatitis B (2-7%). In a study conducted in a hospital-based population at Kathmandu Medical College Hospital, Nepal, the prevalence rate of viral hepatitis B was found to be 2.5% (8). Seroprevalence of Hepatitis B surface antigen (HBV) in present study is 2.4% which coincides with the above study.

In India a low prevalence of 1.0% has been reported by hussain et al [9]. Seroprevalence of HCV varies among hospital-based populations reported from Cuttack (Orissa),was 1.57% [10]. 4.8% from Pondicherry [11] and 2.46% from Jodhpur (Rajasthan)[12]. Geographical variation in the seroprevalence of HCV has also been documented by Sun *et al [13]*. The seroprevalence of HCV in our study was found to be 0.59%.

Presently India is a home for 2.27million HIV positive cases (UN AIDS 2010).Andhra pradesh lies in the six most high prevalence states next to Manipur. Our study showed the seroprevalence for anti-HIV antibodies to be 1.8%.

People with co-infections have high viral loads. Risk of mortality & morbidity increases due to shared transmission pathways & synergistic effects of both viruses. In the present study, the prevalence of co-infection was found to be 0.07%.

Analysis of our results showed that the various demographic factors studied age, sex had influenced the prevalence rates of HIV, HBV and co infection in the population studied. This agrees with study by Hussainetal. [9, 14, 15].

Table 1: Seropositivity of HBV, HCV, HIV & Co infection in the study population

Infections	Status	Males N=1492	Females N=1359	Total N=2851
HBV	Reactive	48 (3.217%)	21 (1.54%)	69 (2.42%)
	Non reactive	1444 (96.78%)	1338 (98.45%)	2782 (97.57%)
HCV	Reactive	11 (0.73%)	6 (0.44%)	17 (0.59%)
	Non reactive	1481 (99.26%)	1353 (99.55%)	2834 (99.4%)
HIV	Reactive	32 (2.14%)	20 (1.47%)	52 (1.82%)
	Non reactive	1460 (97.85%)	1339 (98.52%)	2799 (98.17%)
Co infection (HBV-HIV)	Reactive	2 (0.134%)	0 (0%)	2 (0.07%)
	Non reactive	1490 (99.86%)	1359 (100%)	2849 (99.92%)

Table 2: Age & sex distribution of population with HBV Seropositivity.

Age	Total No. of males tested	No. of males reactive with HBsAg	Total No. of females tested	No. of females reactive with HBsAg	Total seropositivity
<20	84	2 (2.3%)	74	0 (0%)	2 (1.26%)
20-50	816	31 (3.8%)	933	17 (1.8%)	48 (2.74%)
>50	592	15 (2.5%)	352	4 (1.13%)	19 (2.01%)

Table 3: Age and sex distribution of population with HCV seropositivity

Age	Total No . of males tested	No. of males reactive with HCV	Total No. of females tested	No. of females reactive with HCV	Total seropositivity
<20	84	0 (0%)	74	0 (0%)	0 (0%)
20-50	816	3 (0.36%)	933	4 (0.42%)	7 (0.4%)
>50	592	8 (1.35%)	352	2 (0.56%)	10 (1.05%)

Table 4: Age & sex distribution of population with HIV Seropositivity.

Age	Total No . of males tested	No. of males reactive with HIV	Total No of females tested	No of females reactive with HIV	Total seropositivity
<20	84	0 (0%)	74	1 (1.35%)	1 (0.63%)
20-50	816	18 (2.2%)	933	15 (1.6%)	33 (1.88%)
>50	592	14 (2.36%)	352	4 (1.13%)	18 (1.90%)

Table 5 : Co-infection in the population studied.

Co-infection	Positive	Negative
HBV –HIV	2 (0.07%)	2849 (99.92%)

Conclusion

Out of studied population 4.84% individuals are infected with either of infections like HBV, HCV (or) HIV. 0.07% individuals were infected with both HBV & HIV. Among 3 infections, HBV is more prevalent followed by HIV & HCV. Early detection can contribute substantially to the timely diagnosis of the patients with acute illnesses and to an early treatment hence, it can limit the transmission of the infection. The estimation of the seroprevalence of HIV/HBV/HCV coinfection provides reference for future studies on disease

progression and also essential information for effective implementation of control programes.

Recommendations

1. The need of our study is to further Strengthen the Awareness programmes.
2. Active Governmental Educational & media campaign about the risks of infection, routes of transmission & methods of protection.
3. Integration of Hepatitis Screening programmes with ICTC.
4. Hepatitis C screening also should be included in routine screening.
5. As working women are increasing, to limit the risk, they are recommended to undergo regular screening.

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