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Original Article

Infectious Diseases Section

Prevalence of the Human Immunodeficiency Virus, the Hepatitis B Virus and the Hepatitis C Virus among the Patients at a Tertiary Health Care Centre: A Five Year Study

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ABSTRACT

Background: Infection with the Human Immunodeficiency Virus (HIV), the Hepatitis B Virus (HBV) and the Hepatitis C Virus (HCV) is a global health problem. Epidemiological studies world-wide show wide variations in the prevalence patterns of the HIV, Hepatitis B and the Hepatitis C Virus infections. Globally, a total of 39.5 million were living with HIV in 2006, of which approximately 5.7 million were from India. Early detection can contribute substantially to the timely diagnosis of the patients with acute illnesses and to an early treatment and hence, it can limit the transmission of the infection.

Aim: To provide a baseline data on the prevalence of HIV, Hepatitis B and Hepatitis C among the patients who were referred to our hospital over a period of 5 years (2006-2010). This study was planned to evaluate the prevalence of the HIV co-infection with the Hepatitis B and C viruses among the patients who were admitted to and were attending the hospital. Materials and Methods: This was a retrospective study which was carried out among the patients who were attending the AJ Hospital Kuntikana Mangalore, over a period of five years (January 2006 – December 2010). The sera of the patients were initially tested for the presence of anti-HIV antibodies as per the National Aids Control Organisation (NACO) guidelines and they were tested for HBsAg (Hepatitis B surface antigen) and the anti-HCV antibody by an Enzyme linked Immuno-sorbent Assay (ELISA) test.

Results: Out of 24,576 samples or sera which were studied, 608 (2.5%) were sero-positive cases. These included 318 with antibodies to HIV, 285 with antibodies to the Hepatitis B surface antigen and 5 with antibodies to the Hepatitis C Virus. Among the positive cases, a majority were of the age group of 21 to 40 years, with a male preponderance. The anti-HCV positivity showed a significant downward trend during the study period.

Conclusion: The overall prevalence of the positivity for these three markers among the patients who attended the AJ Hospital in this study was comparatively lower than that which was reported by other studies from India. The lower incidence of the HCV positivity which was found in this study was probably due to the lack of awareness about the co-infection with HBV and this was not screened for. Our study demonstrated low HIV / HCV/HBV co-infection rates.

Key Words: Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV), Co-infection, Prevalence

INTRODUCTION

India has the highest HIV/AIDS prevalence in the world, with an estimated 5.7 million people living with HIV/AIDS according to the UNAIDS [1]. India now has the third largest number of individuals with HIV/AIDS after south Africa and Nigeria [2]. Co-infection of HIV with the hepatitis B and the hepatitis C viruses is a common event due to the similar routes of transmission [3]. In India the estimated number of children who are living with HIV/AIDS is 202,000 as per the UNAIDS. However, half of these children die undiagnosed before their 2nd birthday. The predominant mode of transmission of HIV in children is vertical i.e., it is acquired through the intrauterine or intra-partum routes or through breast feeding from an HIV infected mother. The WHO program of "3" by "5" whereby 3 million people would be given antiretroviral therapy (ART), of which 10 to 15% would be children, by the year 2005. However, very few children in India had access to ART till the year 2005 and thus, even though children represented about 4% of the total population with HIV/AIDS, they accounted for almost 18% of the deaths in 2005 [4].

The national HIV prevalence is 0.8% and there are certain areas such as Maharashtra, Andhra Pradesh, Tamil Nadu, Karnataka, Manipur and Nagaland that account for over 80% of all the reported AIDS cases in the country [5]. The vertical transmission of HBV in India is considered to be infrequent. HBV vaccination in an expanded program of immunization is essential to reduce the HBV carrier frequency and the disease burden [6].

In India, approximately 1.8% to 2.5% of the population is presently infected by HCV and about 20 million people are already infected with HCV [7]. Routine surveillance and screening of the blood strengthening the services for the treatment of sexually transmitted diseases, thus preventing the mother to child transmission of the blood borne pathogens. This proposal has been put forward by the National AIDS Control Organization (NACO) guidelines [7,8]. The National AIDS Control Program is the most visible vertical health program in India because of much global attention and the fear of a rapidly growing HIV epidemic. Recently, the Center for Disease Control (CDC) has revised

the guidelines for HIV testing and it has introduced expanded screening in the health care setting with streamlined procedures for the pre-test information and the consent of the patients [9]. There are very few studies which are available regarding the prevalence of HIV, HBV and HCV among the patients in the coastal area of Karnataka. Hence, a surveillance study was undertaken at our centre.

MATERIALS AND METHODS

This was a retrospective study which was carried out among the patients who were attending the AJ Hospital, Kuntikana, Mangalore, India, over a period of five years (January 2006–December 2010). Patients with a clinical history and signs and symptoms which were suggestive of an immuno-compromised condition and those patients who were admitted to the hospital for surgery were also screened after getting a written consent from them as per the NACO guidelines. All the sera were initially tested for the anti-HIV antibody, HBsAg and the anti- HCV antibody by the Enzyme linked Immuno-sorbent Assay (ELISA) test (manufactured by J.Mitra Diagnostics, Microlisa-HIV ELISA, Eliscan HIV 1st, 2nd and 3rd generation ELISA kit, J.Mitra Diagnostics Hepalisa-HBsAg ELISA, Microlisa-HBsAg ELISA-HBsAg 3rd generation ELISA kit. J.Mitra Diagnostics Microlisa-HCV ELISA and the Eliscan HCV 3rd generation ELISA kit). This was a qualitative assay, with each micro-well being coated with the recombinant HIV antigen, the HBV antibody and the HCV antigen respectively. The positive sera were confirmed by a repeat ELISA. The validity of the ELISA tests was assessed by means of acceptance criteria which were laid down by the manufacturer for the absorbance of the reagent blank as well as for the mean absorbance of the positive and negative controls which were present with the test kits. The cut off value for reporting the positive results was calculated as per the manufacturer's directions. Known positive and negative controls were used as the external controls.

RESULTS

Out of the 24,576 patients who were studied, there were 608 (2.5%) sero-positive cases. These included 318 (1.24 %) with HIV, 285 (1.56 %) with the Hepatitis B surface antigen and 5 (0.2 %) with the Hepatitis C Virus. Among the positive cases, a majority were of the age group of 21 to 40 years, with a male preponderance. The anti-HCV positivity showed a significant downward trend during the study period. There was an increase in the prevalence among the male population as compared to that in females, as shown in [Table/Fig-1, 2 and 3]. and a majority of them belonged to the age group of 21-40 years, as shown in [Table/Fig-4, 5 and 6]. Many factors favour mixed infections, which include a high degree of epidemiological similarity between the HIV and the hepatitis viruses. They have similar routes of transmission, similar risk factors such as a high risk sexual behaviour and a higher prevalence than other sexually transmitted diseases. Studies on the prevalence of the hepatitis viruses in patients with HIV have shown the HIV and the HBV/HCV co-infection rate to be 12%–15%. However, studies from India have shown that this varies with the geographical region. Rates of 9%–30% for HBV and 2%–8% for HCV have been reported [10 -12]. Our study demonstrated a low HIV/HCV/HBV co-infection rate of (0.2%). Five among the 603 seropositive cases were positive for both HIV and HBsAg. Due to a similarity in the risk factors and the routes of transmission, public awareness and education would go a long way in curbing the prevalence of these infections. Thus, the disease duration and the use of the anti-viral therapy could not be estimated. This may be due to the fact that the patients who were attending the hospital were probably from a better socioeconomic background.

Year	Male	Female
2006	52	16
2007	40	10
2008	42	15
2009	39	30
2010	51	23

[Table/Fig-1]: Prevalence of HIV

Year	Male	Female
2006	35	12
2007	18	14
2008	28	13
2009	62	26
2010	57	20

[Table/Fig-2]: Prevalence of HBV

Year	Male	Female
2006	0	0
2007	0	0
2008	0	0
2009	0	0
2010	3	2

[Table/Fig-3]: Prevalence of HCV

Year	<10 years	11–20 years	21–40 years	41– 60 years	>60 years
2006	0	4	32	6	5
2007	2	1	35	11	1
2008	1	13	21	5	1
2009	1	6	45	25	11
2010	1	12	37	19	8

[Table/Fig-4]: Year of investigation and age group positive for HBsAg

Year	11–20 years	21–40 years	41–60 years	>60 years
2006	6	35	14	12
2007	1	18	11	2
2008	0	36	20	0
2009	2	42	22	3
2010	10	42	11	9

[Table/Fig-5]: Year of investigation and age group positive for HIV

Year	11–20 years	21–40 years	41– 60 years	>60 years
2006	0	0	0	0
2007	0	0	0	0
2008	0	0	0	0
2009	0	0	0	0
2010	0	4	1	0

[Table/Fig-6]: Year of investigation and age group positive for HCV

DISCUSSION

Stringent measures need to be undertaken on urgent basis, which include the dissemination of information, strict screening of the blood and inclusion of the antibody to the hepatitis B core antigen and other sensitive markers to the screening protocol. Having acquired the knowledge about the importance of such a co-infection, it is essential that all the patients who are infected with HIV be screened for the HBV and the HCV co-infection. Sero-positive patients visit the healthcare centre, but they are not tested for the infection with HIV, Hepatitis B and Hepatitis C, until late in the course of their disease. Hence, they are deprived the benefit of the antiviral therapy and this has been documented in several studies [13-17]. In a study which was carried out among the tribal population of central India, the HBV carriage rate was found to be 3.4% among the STI patients as against 2.9% in the general population. The HCV prevalence was 3.9% in the STI patients and it was 4.6% in the general population. No HIV infection was found in the study population. Our study population showed a prevalence of 1.24 % with HIV, the Hepatitis B surface antigen was detected among 1.56 % patients and 0.2 % showed a prevalence of with the Hepatitis C Virus.

CONCLUSION

To conclude, the overall prevalence of the positivity for the infectious disease markers among the patients in this study was similar to that which was reported by other studies from India, except for the lower incidence of the HCV positivity which was found in this study as compared to that in other studies [15,16]. Although HBV showed decreasing trends, it cannot be relied upon because the patients were screened only for HIV and HBsAg initially. The implications of the HBV or HCV co-infection in the HIV patients are of great importance in India too, as an increasing number of patients are diagnosed to be having HIV disease [18]. The knowledge of this co-infection in patients with HIV is vital, as they will live longer on the antiretroviral treatment and they will also need to be managed for their co-infection with HBV or HCV [19]. In addition, the derangement of the liver functions as a result of the therapy (Antiretroviral therapy or the treatment for opportunistic infections) may also complicate the situation [20]. Our study demonstrated low HIV /HCV/HBV co-infection rates as compared to those in other studies from India [15,17]. The sero-prevalence rates of HIV among males and females from the general population were 4.3% and 2% [21]. The HBV co-infection was detected in 2.61% of the patients at a hospital at Delhi, which was partly attributable to the low incidence of intravenous drug use and infrequent transfusion-related infections [22]. This study was in concordance with our data of a low prevalence of a 0.2% HBV co-infection among the HIV patients in this part of the country, which was due to better socio-economic conditions and health education [23].

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