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ORIGINAL ARTICLE

Seroprevalence Of The Human Immunodeficiency Virus (HIV) 1 And 2 Infections In A Tertiary Care Hospital

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ABSTRACT

Context: India is one of the largest and the most populated countries in the world, with over one billion inhabitants. Karnataka, a diverse state in the south west of India, has a population of around 53 million people. The districts with the highest prevalence of HIV infections tend to be located in northern Karnataka, which is known as the “Devadasi belt”. Many women from this part of the country are supplied to the sex trade in big cities such as Mumbai. **Aim:** The present study was done to know the seroprevalence of the Human Immunodeficiency Virus (HIV) which is the causative agent of the Acquired Immune Deficiency Syndrome (AIDS). **Materials and Methods:** Ten thousand seven hundred and sixty one (10761) blood samples were screened for the presence of the HIV-1 and HIV-2 antibodies by using a TRI DOT kit and third generation ELISA from August 2008 to July 2010. **Results and conclusions:** Out of the 10761 samples screened, antibodies to HIV-1 were present in 525 (4.9%) patients, of which 307 (58.5%) were males and 218 (41.5%) were females. No HIV-2 case was detected. The prevalence of the viral infection also varied with age, the highest prevalence rate being 262 (50%) as recorded in the age group of 21-40 years, while the age group of 1-20 years had the lowest percentage positivity with a prevalence rate of 42 (8%). The findings of this study emphasize the more urgent need for interventional measures like sex education and health and preventive education among the general population.

Key words: AIDS, Seropositivity, Seroprevalence, HIV.

Key Messages:

There is a high prevalence of the HIV - 1 infection in North Karnataka.

The highest prevalence was seen in the age group of 21- 40 yrs.

There is an urgent need for interventional measures like sex education and health and preventive education among the general population.

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INTRODUCTION

The Human Immunodeficiency Virus (HIV) is the aetiological agent of the Acquired Immunodeficiency Syndrome (AIDS) [1], [2], [3]. HIV is one of the human T-cell lymphotropic retroviruses (human T-cell leukaemia virus types I and II), of the family Retroviridae and sub family Lentivirinae [4],[5],[6],[7]. The human immunodeficiency virus (HIV) epidemic continues to be a burden globally and presents serious public health problems in developing countries, especially in India. It has also been reported that HIV-1 is more pathogenic and is found in Asia. At the beginning of 1986, despite over 20,000 reported AIDS cases worldwide [8], India had no reports of HIV or AIDS[9]. Since the human immunodeficiency virus (HIV) was found in Chennai in 1986, India has had an AIDS epidemic [10]. In many respects however, its extent and complexities have only recently begun. India has a population of 1.2 billion, which is one sixth of the world's population and is home to perhaps- one of every eight people with HIV infections. It is estimated that around 2.27 million people are currently living with HIV[11].

According to Denis Broun, the country coordinator for the Joint United Nations Program on HIV / AIDS (UNAIDS) in India, "It is not possible to control the overall HIV epidemic if it is out of control in India. Whatever success is recorded in India, will immediately have an impact on the overall world situation, just because of the sheer numbers." In 2006, UNAIDS estimated that there were 5.6 million HIV-infected people in India [22], as compared to 5.5 million people in South Africa, which captured wide attention. It remains uncertain however, whether India has more infected people than those in any other country. The epidemiological data for India (estimates of the number of infected persons- range from 3.4 million to 9.4 million) are far less precise than for South Africa (4.9 million to 6.1 million)[12]. The estimate for India is based primarily on anonymous testing data from public clinics for prenatal care and for patients in high-risk groups or with sexually transmitted infections[2]. Although the number of surveillance sites is expanding, the

data may still be skewed and inadequate.[13], [14]. In 2005, no data were available for more than 600 districts in India. The estimated HIV prevalence among people who are 15 to 49 years old in India is 0.5 to 1.5%, whereas in South Africa, it is 16.8 to 20.7%. The AIDS pandemic claimed an estimated 2.1 million (range 1.9-2.4 million) lives in 2007, of which an estimated 330,000 were children under 15 years. Globally, an estimated 33.2 million people lived with HIV in 2007, including 2.5 million children and an estimated 2.5 million (range 1.8-4.1 million) people were newly infected in 2007, including 420,000 children[15]. A majority of HIV infections are acquired through unprotected sex, blood transfusion, contaminated hypodermic needles, exchange between mother and baby during pregnancy, childbirth, breast-feeding, or other exposures to one of the above body fluids [17],[18],[19],[21]. In Karnataka, the districts with the highest prevalence tend to be located in northern Karnataka, which is known as the "Devadasi belt", [19] where the present study was carried out.

MATERIALS AND METHODS

Study area and population

The present study was carried out to know the seroprevalence of HIV 1 and 2 in our tertiary care hospital. This study was designed to cover the individuals from our district. The demographic information about each person who was screened was obtained. The information included sex, age, occupation and address. All information about the persons who were screened, was kept confidential.

Sample collection

Five milliliter (5 ml) of peripheral blood samples were collected by venous puncture by using sterile syringes and needles, following informed consent, from August 2008 to July 2010. The arm of each individual was first tied with a tourniquet and the position of the vein was disinfected with spirit swab. A separate needle and syringe was used for each sample collection. The blood samples were transferred into sterile universal bottles. Serum was extracted by centrifugation of the blood samples at 3000 rpm for 10 min and was

stored frozen at -20°C until the serum samples were analyzed in the laboratory.

Detection of antibody

The blood samples were screened for HIV-1 and/or HIV-2 antibodies by 3ERS (ELISA,Rapid, Simple) format (ELISA-Microlisa, J Mitra and co Pvt. Ltd, Combaid Span Diagnostics Ltd, HIV – Tri dot, J Mitra and co Pvt. Ltd).

Interpretation of test results

The results were interpreted according to the manufacturer's instructions.

Statistical analysis

Statistical analysis was done by using the Chi – square test.

RESULTS

Out of the total 10,761 samples which were screened, HIV antibodies were found in 525 (4.9%) patients, of which 307 (58.5%) were males and 218 (41.5%) were females [Table/Fig 1].

[Table/Fig 1]: Prevalence of HIV infection in the study population

Study participants	Number of positive Cases	Number of Negative Cases	Number of Total Cases
Male	307	5288	5595
Female	218	4948	5166
Total	525	10236	10761

Chi Square = 9.291 degree of freedom $P=0.002$ ($P<0.05$)

The prevalence of HIV infection in the study population was 4.9%. There was a significant difference in the infection rate between males and females. The prevalence of the viral infection also varied with age, the highest prevalence rate which was recorded was in the age group of 21-40 years, with 262 (50%) out of 525 subjects being positive. The age group of 1-20 years had the lowest percentage positivity [Table/Fig 2].

[Table/Fig 2]: Age specific Prevalence of HIV infection in study population

Age group	Number of positive Cases	Number of Negative Cases	Number of Total Cases
1-120	42	4585	4627
21-40	262	3153	3415
41-60	168	1726	1894
61-80	53	772	825
Total	525	10236	10761

Chi Square = 283. 91 3 degree freedoms $P = 0.0000000000.....$ ($P<0.01$)

DISCUSSION

The sero-prevalence of HIV infections from August 2008 to July 2010 was 4.9%, which

was indicative of a higher prevalence among different groups of populations. The prevalence rate which was recorded in this study, was in conformity with the research conducted by Bairy et al[15]. The results of this study are significant and are also indicative of an emerging epidemic in this area. As the world enters the third decade of the HIV/AIDS epidemic, the evidence of its impact is undeniable. The HIV infection was found to be significantly higher in males (58.5%) than in females (41.5%), which is also in agreement with the study conducted by Kreiss et al [20]. This high percentage recorded among the males could be attributed to the more risky sex behaviour practiced by males than the females, due to the prevailing socio-cultural-economic scenario. One study done in Malawi showed the highest prevalence to be in a younger age group (25-34 years) in 1994, which shifted to an older age group (35-44 years) in 1998. From the above results, it was apparent that more cases were being detected in the older age groups. From the present study, it is very clear also, that in our district, the HIV infection is getting rooted in the older age group population, which represents the sexually active group as well as the ones who are most likely to be involved in risky nonsexual practices such as tattooing, scarification marks and barbing with shared unsterilized instruments. Other contributing factors to the sustained spread of HIV/AIDS were pre-marital and extramarital sexual contacts.

CONCLUSION

The findings of this study emphasize the more urgent need for interventional measures like sex education, health education and preventive education among the general population to reduce spread of HIV infection. We hereby recommend the voluntary screening of every individual in order to establish their HIV status. All women who are at high risk of HIV infection should go for HIV testing. Finally, at all levels, the government should create employment opportunities, especially a decent and alternative means of living for those who are driven into the commercial sex business due to poverty.

The growing threat of HIV demands a shift from the theoretical to R and D – intensive solutions. There is a need to spearhead an HIV/AIDS vaccine development program in

India. This is a preliminary study on HIV/AIDS in this part of the country. Such studies will be helpful in carving out appropriate policies to curb the spread of HIV/AIDS in India.

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