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Socio-economic and demographic pattern of HIV occurrence amongst attendees in a tertiary care hospital in Eastern India.

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Abstract

Objective: To analyze the socio-economic pattern amongst HIV patients in eastern and north-eastern India as measured by different parameters such as educational status, wealth, marital status, sexual behaviour.

Methods: This study involved 650 HIV seropositive individuals enrolled in a HIV Apex Clinic in a tertiary care hospital in Kolkata, India during 2006 to 2011. Socio-demographic data were obtained while keeping the names of HIV seropositive individual's names confidential. HIV testing was done according to the guidelines of NACO, India. Diagnoses of different common opportunistic infections were also done.

Results: Out of the 650 individuals, 53% reported to have presenting symptoms of low grade fever, 21% had weight loss, general weakness and malaise. 13% reported to have frequent skin rashes, 13% ported to severe seizures and lack of coordination. 41.07 % of them had an income ranging from Rs1000 - 1500 per month. These individuals mainly were daily workers, labourers who work in per day income basis. 44.13% (89 out of 202) of the females were married at a young age, 65 (32.17%) were widowed whose husbands succumbed to HIV. Assessment of the educational qualifications reveals that those individuals affected reveals that 65% of the males received education till standard VIII, 25% received elementary education till standard IV.

Conclusion: The study highlights the sectors of the socio-economic class who need more attention to tackle the HIV burden. The analysis of the socio-economic status reveals the low income and lack of education are main contributing factors towards the spread of this disease in this region.

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Introduction

The effect of AIDS epidemic in developing world has an immense effect because of several factors of which the socio economic condition of those individuals affected in some countries of Africa and Asia continues to pay the price most heavily. At the end of 2010, an estimated 34 million people were living with HIV globally, including 3.4 million children less than 15 years. In Asia about 4.8 million people were living with HIV in 2010 [1]. Reductions in the number of people acquiring HIV infection, especially people 15–24 years old in the countries in sub-Saharan Africa that have a high burden of HIV, have been offset by increases in new infections in Eastern Europe and Central Asia, where the primary mode of transmission among people who inject drugs and their sexual networks [1,2]. Access to HIV testing and counselling is increasing: coverage of HIV testing and counselling among pregnant women rose from 8% in 2005 to 35% in 2010. Nevertheless, the majority of people living with HIV in low-and middle-income countries still do not know their serostatus[2]. Women, especially young women, remain disproportionately affected in sub-Saharan Africa, highlighting the need to address gender inequity and harmful gender norms as a central component of the global response to HIV [3] Key populations at higher risk of HIV infection and transmission, including people who inject drugs, men who have sex with men, transgender people, sex workers, prisoners and migrants continue to be underserved by current HIV services and often have the highest HIV prevalence in areas with both generalized and concentrated epidemics [4].

India is one of the largest and most populated countries in the world, with over one billion inhabitants. Of this number, it's estimated that around 2.4 million people are currently living with HIV. HIV emerged later in India than it did in many other countries. Several factors like poverty, illiteracy, poor hygiene conditions are the main factors which have contributed to the spread of this disease [5].People living with HIV in India come from incredibly diverse cultures and backgrounds. The vast majority of infections occur through heterosexual sex (80%), and is concentrated among high risk groups including sex workers, men who have sex with men, and injecting drug users as well as truck drivers and migrant workers [6]. Due to vast size of this country, it is often difficult to exactly analyse the pattern and the socio-demographic characteristics which influence the spread of this disease. Understanding the socio-demographic characteristic patterns of the people infected with HIV is important as the distribution of the epidemic shows heterogeneous results. Certain pockets like the north eastern states of India shows a higher epidemic rate than the rest of the country, certain groups like the High Risk Group (HRG) require greater attention.

Studies have shown that individuals infected with HIV are susceptible to a wide array of opportunistic infections, in addition to infections that are pathogenic to hosts without HIV infection [7]. The latter infections tend to be more common and more severe in persons with HIV infection. Individuals infected with HIV have lowered immunity levels hence they are prone to be susceptible to a wide variety of opportunistic infections (OIs). Most of the HIV infected individuals have a mortality rate due to secondary infections. As the CD4 lymphocyte levels falls below 200 cells/mm^3 the risk for opportunistic infection increases [8]. Certain OIs are associated with reversible increases in circulating viral load, and these increases could lead to accelerated HIV progression or increased transmission of HIV. Despite the availability of ART, OIs continue to cause considerable morbidity and mortality for three primary reasons: 1) many patients are unaware of their HIV infection and seek medical care when an OI becomes the initial indicator of their disease; 2) certain patients are aware of their HIV infection, but do not take ART because of psychosocial or economic factors; and 3) certain patients are prescribed ART, but fail to attain adequate virologic and immunologic response because of factors related to adherence, pharmacokinetics, or unexplained biologic factors [9] Thus, although hospitalizations and deaths have decreased since the implementation of ART, OIs remain a leading cause of morbidity and mortality in HIV with huge economic burden.

This study aims to explore the pattern of socio-economic changes as well as the different demographic variables that the HIV population go through. The importance of the socio-economic status is that it would aid the policy makers and the clinicians in shaping the future programs in tackling this disease which is on the rise in India. Among the variables analyzed are the associations of the HIV status and the various variables including the education status, income (if above or below the poverty line), residence, age, marriage, no. of children empowerment infected persons. Though the studies have been done in the pan Indian basis, not much demographic data is available on the eastern and the north eastern states which according to NACO are highly endemic regions for the HIV disease [10]

Materials and Methods

Study population and Blood sample collection
This study involved 650 HIV seropositive individuals enrolled in a HIV Apex Clinic in a tertiary care hospital in Kolkata, India during 2006 to 2011. Subjects eligible for the study included all patients who agreed and signed the consent form, in case of minors consent was

obtained from their parents. These patients were from different parts of the eastern and north eastern region of India. While obtaining the socio-demographic data in a prescribed format the names of the individuals were kept confidential. The HIV testing was done according to the guidelines of National AIDS Control Organization (NACO), India. Five millimetres of blood were collected and serum separated, aliquoted and stored at -70ºC until further testing.

Determination of CD4+

The CD4+ counts of the HIV seropositive persons were estimated using FACS CALIBUR flow cytometer (Becton Dickinson, California, USA). Standard dual color immunophenotyping method was performed using whole blood.

Diagnosis of Opportunistic Infections

The diagnosis of the opportunistic infections was done according to the guidelines of Centre for Disease Control and Prevention (CDC).

Patients who complained of a persistence of loose stools for at least 4 weeks were taken as examined for Chronic Diarrhoea [11] The stool test was done to determine if the chronic diarrhoea is watery, inflammatory or fatty diarrhoea.

The patients who had more than two weeks of cough, blood in sputum and chest pain were only considered for the tuberculosis test. The diagnosis of tuberculosis (TB) was confirmed by microscopic examination of the sputum using acid fast bacilli (Ziehl-Neelsen) staining followed by chest radiogram before coming to a conclusion. Oral candidiasis was diagnosed by microscopic examination of the yeast forms from the oropharynx [12,13]

Statistical Analysis

The statistical analysis was performed using student's t test. The Null Hypothesis was also tested and a P value < 0.05 was considered statistically significant. Mean, median was also estimated.

Results

Socio-demographic characteristics

650 HIV seropositive individuals' patient records were analysed and the different socio-economic correlates were recorded and tabulated from a tertiary care centre in Kolkata, India. Of these, 448 individuals (68.92%) were males, 202 individuals were females (31.07%). Out of the 448 males: 125 were truck drivers, 163 were migrant labours (like daily wage workers, masons, fruit sellers, helpers to the truck drivers who travel throughout the country), 50 individuals reported to be in private service, 75 individuals were self employed, 25 individuals were found in service, while 10 individuals refused to divulge details of their profession. Assessment of the educational qualifications reveals that those individuals affected reveals that 65% of the males received education till standard VIII, 25% received elementary education till standard IV, 08% received secondary education and above and 02% were illiterate. Out of the males 35 (7.81%) reported to have multiple partners, which might be one of the possible routes of HIV transmission, 209 (32.15%) had interaction with female sex worker, 21 (3.23%) reported to have used syringes at certain point of time, or were drug users, 65 (14.50%) reported to have a blood transfusion history, whilst no records were found for the rest of the individuals. None of the patients reported homosexual practices. Out of the 202 female HIV seropositive individuals, 175 (86.63%) were housewife with no substantial income of their own and largely dependent upon their husbands for their sustenance. Amongst the females the median age was lower at 25 years. 44.13% (89 out of 202) of the females were married at a young age, 65 (32.17%) were widowed whose husbands succumbed to HIV.

Economic Status

The analysis of the economic status of the individuals reveals that out of the 448 males, 184 (41.07%) of them had an income ranging from Rs.1,500 - 2,000 per month. These individuals mainly were daily workers, labourers who work in per day income basis. 33 (7.36%) individuals reported to have no income as they were out of work due to HIV related complications but they were employed before manifestation of AIDS. 71 (15.84%) individuals had an income less than Rs.1,500 per month and they were classified as living below the poverty line. These workers are mostly farmers and seasonal workers who work only when the agriculture season is on and remain out of work for the rest of the season.131 (29.24%) individuals reported to have an income ranging from Rs.3,500- Rs.5,000 per month. These group of people consisted mostly people employed in service sector like in private companies or employed as carpenters, goldsmith, masons, truck driver etc. 20 (4.46%) individuals refused to divulge details of their income status. Nine (2.03%) individuals reported to have an income ranging from Rs.5,000 and above.

Clinical Characteristics

Out of the 650 individuals 53% reported to have presenting symptoms of low grade fever, 21% had weight loss, general weakness and malaise. 13% reported to have frequent skin rashes, 13% ported to severe seizures and lack of coordination. Generally, most of the individuals were referred by medical practitioners or approached on their own, largely the patients came

to the clinic with common complaints of fever, weight loss and diarrhea, and subsequent investigation revealed them HIV seropositive. Due to the clinic being a tertiary care centre hence, the true proportional representation of the population could not be accurately ascertained.

Epidemiological findings

In the present study all the 650 HIV seropositive individuals were HIV-1 infected and we couldn't find any HIV-2. Out of the 650 individuals investigated oral candidiasis (230 out of 650, 35.38%) was found to be the commonest opportunistic infection (median CD4+ count 148 cells/mm^3) followed by chronic diarrhoea 110 (16.92 %, median CD4+ count 213 cells/mm^3), and tuberculosis 95 (14.61 % , median CD4+ count 167 cells/mm^3).

Discussion

This study investigates the socio-economic correlates prevalent in eastern and north-eastern India as measured by different parameters such as educational status, wealth, marital status, sexual behaviour. This is culturally a heterogeneous population group. A host of studies have concentrated on the entire country as a whole, but this study focuses on the eastern, north eastern zone where the number of people with HIV is increasing at an increasing rate. An alarming trend in the developing countries is the steadily increasing percentage of women who are affected by HIV- particularly early marriage by women remains an important risk factor. A study by Clark, Bruce, Dude argues that early marriage by females presents an important risk factor for HIV among this relatively large segment of the population [14] Studies have shown that certain demographic factors such as gender, age of marriage have an important role in the transmission of HIV [14]. Therefore, one of the most important aspects of this study is that it identifies the segments of the general population that are more susceptible to acquire HIV and the target group on whom the preventive policies will be targeted. Our study reveals that HIV seropositive status predominates amongst the truck drivers who remain away from home for long periods of time. Males are by and large the mostly infected and they are responsible for the transmission of the virus to their wives. Educational status also plays an important role as observed from our data; most of the HIV infected were standard VIII school pass outs hence the lack of proper education and knowledge of preventive measures is also responsible for the increasing transmission of this disease. Another trend noticed was that the women affected were generally married at a young age and uneducated which is indicative of the fact that the prevalent social practice of marrying girls at a young age is partly responsible for spread of the disease. Also fear of ostracism and social stigma prevents many individuals from coming out in the open and approaching the healthcare professionals for their treatment. The economic status analysis reveals that most of the Opportunistic Infections (OIs) were among many HIV seropositive individuals which could lead to high morbidity and mortality rate due to HIV in this region. Oral candidiasis (OC) was found to be the major opportunistic infection followed by chronic diarrhoea and tuberculosis and this data is in accordance with Saha et al. [15] The low economic status of these HIV positive individuals is an alarming trend showing increase in OIs among them which further elucidates the role of proper health and hygiene as an influencing factor associated with HIV infection. 41.07% of the individuals reported to have low income ranging below Rs 1500 which indicates the fact that low income has an important role in the spread of this disease; also due to the low income many individuals hesitate approaching the doctors as they cannot bear the expenses. The low economic status indirectly affects the social life of the individual's family too as early mortality rate makes their family members helpless and leaves them in even more poverty Table 1.

The findings of our study are important as it addresses the need for joint counselling of both partners of HIV seropositive individuals so that future prevention strategies could be undertaken. The study highlights the sectors of the socio-economic class who need more attention to tackle the HIV burden. The study aims to provide important inputs to clinicians and public health policy makers so that future intervention and prevention strategies could be planned in tacking this disease.

Table-1; Age, literacy level, Oppurtunistic Infections (OIs) and socioeconomic distribution among HIV (+ve) subjects.

FACTOR		No. of HIV Positive	Median CD4+ value (cells/mm^3)	P value
Males		448	174	P<0.05
	Married	74.10%		
	Unmarried	25.90%		
Females		202	182	P<0.001
	Married	48.02%		
	Unmarried	19.80%		
	Widow	32.18%		
Educational Status				
	Standard VIII	65%		
	Standard IV	25%		
	Illiterate	2%		
	Secondary and above	8%		
Economic Status	Monthly Rs. 5000 and	2.03%		
	Rs. 3000 to Rs.5000	29.24%		
	Rs.1000 to Rs. 1500	41.07%		
	Less than 1500	15.84%		
	No income	7.36%		
	Refused to divulge	4.46%		
Opportunistic Infections				
	Oral Candidasis	35.38%	148	p<0.001
	Chronic Diarrhoea	16.92%	213	P< 0.01
	Tuberculosis	14.61%	167	P<0.001
	Others	33.09%		
Fever		53 %		
Weight loss		29%		
Skin rash		13%		
Seizures		5%		

Note: The numbers are shown in percentage unless otherwise stated; +ves, Positives; P- Value, probability value calculated using chi-square test and CD4 represents Cluster of Differentiation 4.

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