

Changing Trends of Socio-Economic and Demographic Profile of HIV Positive Patients Over a Decade

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Abstract

Introduction:

Ever since Human immunodeficiency virus (HIV) has been diagnosed, it became a twinge to the healthcare system globally. An estimated 0.8% of adults aged 15-49 years worldwide are living with HIV. In India, the incidence and prevalence of HIV has decreased significantly in the last few years. In the past, the majority of the people affected belonged to the lower socio-economic status, however, in the recent days, a change in trend in the socio economic and demographic profile has been observed in the HIV affected population.

Material and Method:

This was a retrospective study done by analysing the patient's database recorded at the ART Centre (ARTC), Rohtak, a tertiary health care centre. The data was analysed for a period of around 13.5 years from July 2006 to December 2019. This study was duly approved by the Ethics Committee of PGIMS, Rohtak and Project Director of SACS (State AIDS Control Society) Haryana. The patients were divided in two subgroups: from July 2006 - 31st December 2011 (group A) and from 1st January 2012 to 31st December 2019 (group B) to observe and analyse the demographic profile of patients and any changing pattern over the decade.

Results:

A total of 27,357 patients were registered from July 2006 - December 2019. The majority of the patients belonged to 25-45 years' age group in both groups. However, the number of patients in age group 15-25 years were more in group B (35.5%) as compared to group A (26.3%) indicating that more of young people are getting infected since last 8 years. The proportion of students getting infected increased strikingly from 3.02% in group A to 13.5% in group B. Occupation such as truck drivers, was the major risk factor for HIV infection in group A whereas in group B, migrant population became the highest risk group. 82.54% of the patients in group A were from rural areas of Haryana and 17.46% from urban areas whereas in Group B, patients belonging to urban areas increased to 45.78%. The sexual route remained the primary mode of transmission of infection in both the groups. An important point to note is that mother to child transmission has decreased from 5.87% in group A to 3.67% in group B. The number of deaths due to HIV also decreased in the latter group (31.2% in group A to 22.1% in group B). The frequency of opportunistic infections also decreased in the second group with the biggest fall seen in cases of tuberculosis and other respiratory infections.

Conclusion:

In the absence of a definite cure, HIV remains a lifelong morbidity and affects a patient's life including vocational, social and financial status. Some sections of the society such as sexual workers, migrant labours and truck drivers are more vulnerable groups. Importance of school sex education has also emerged as more and more young people are getting infected. The regular demographic profiling of patients, studying the risk factors and computing the impact of socio-economic status on disease will help to make better policies and reach the grass root level.

Keywords: HIV, AIDS, mother to child transmission, opportunistic infections

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Introduction

Ever since the first case of Human immunodeficiency virus (HIV) has been diagnosed, it became a twinge to the healthcare system, hitting the financial arm as well as impairing the social life of affected patients. Earlier, lack of awareness and fear of social discrimination acted as a catalyst in the rapid rise of number of infected patients who were getting diagnosed in the final stages of disease. Since then, in terms of understanding of the disease a lot of advancement has been made to stop transmission and in developing the therapies to control the progression but on the social front, greater reforms and acceptance are still needed.

According to the WHO, 38 million people worldwide were living with HIV in 2019, in which 1.8 million were children (age less than 15 years) [1]. Although the burden of the epidemic continues to vary considerably between countries and regions, an estimated 0.8% of adults aged 15-49 years worldwide were living with HIV infection. It is estimated that 1.7 million individuals became newly infected with HIV in 2019 much more than the 2020 goal of less than 5 lakh infections per year. The vast majority of People living with HIV (PLHIV) are in low and middle income countries. In 2019, there were 20.7 million people living with HIV (54%) in Eastern and Southern Africa, 4.9 million (16%) in Western and Central Africa, 5.8 million (14%) in Asia and the Pacific and the rest in Europe and North America [1]. Though globally the incidence-prevalence ratio is steadily declining from 11.2% in 2000 to 6.6% in 2010 and 4.6% in 2018 [1].

Considering the route of transmission, sexual route remains the most important. Globally mode of transmission of new HIV is 26 times higher among men who have sex with men, 29 times higher among intravenous drug abusers, 30 times higher for sex workers and 13 times higher for transgender people [1].

The HIV epidemic not only affects the health of individuals, it impacts households, communities and the development & economic growth of nations. As per India HIV Estimation 2017 report, adult (15-49 years) HIV prevalence in India was estimated at 0.22% (0.16% - 0.30%) in 2017 [2]. In the same report it was highlighted that 0.25% of the male population and 0.19% of the female population is living with HIV. However, the adult HIV prevalence at national level continued its steady decline from an estimated peak of 0.38% in 2001-03 to 0.22% in 2017 [2]. Consistent declines were noted both in male and female population at the national level. Since 2005, the number of AIDS (acquired immunodeficiency syndrome) related death also showed a consistent decline. Despite the decreasing numbers, the actual problem is beyond the numbers, affecting a particular

group of patients more than others and still there are many known but yet unaccounted challenges. In India, majority of the affected people belong to the lower socio-economic strata, where illiteracy prevents them from getting access to various awareness and preventive strategies formulated by the Government. Despite advances in understanding of HIV and significant efforts by the global health community and government organisations, a significant proportion of people still do not have access to preventive care and treatment. At present, 62% of infected adults aged more than 15 years are under treatment globally. 54% of infected children also have now access to ART. Females are lagging in terms of treatment compliance, with 52% adult females taking ART as compared to 55% adult males [1]. Since prevention of mother to child transmission was specially targeted to protect the next generations, the numbers are very encouraging as compared to 2018, 82% of pregnant women living with HIV had access to antiretroviral medicines, up from 47% in 2010 [1,3].

Being the second largest country in terms of population, India has emerged to be a major player in global HIV epidemic, therefore, more efforts are needed to change the course of this epidemic disease in our country. Our hospital is the apex ART (anti-retroviral treatment) centre of Haryana which is also now connected to link ART centres. This retrospective analysis was done to describe and understand the profile of the HIV infected people in this region. The data was retrieved from the patient's database who were registered in the ART centre and baseline demographics were recorded by the interviewers and counsellors posted in the centre.

Materials and Method

This was a retrospective study conducted by analysing the data of patients registered at the ART Centre (ARTC), Rohtak, a tertiary health care centre for a period of 13.5 years from July, 2006 to December, 2019. The study was duly approved by the Ethics Committee of PGIMS, Rohtak and Project Director of SACS (State AIDS Control Society), Haryana.

27,357 new patients were registered at ARTC, Rohtak from 2006-2019. Of these, 2,775 patients were transferred out to other states ARTC therefore only their baseline data were available for study purpose, follow up details, such as opportunistic infections and treatment course, were not available. However, the total study population was still considered 27,357. All these patients were interviewed by counsellors, trained and authorized by the Haryana State AIDS Control Society (HSACS), a state level body of the National AIDS Control Organisation (NACO). The Patients were enquired about their demographic details like name, age, gender, residing place, education, occupation, monthly income, marital status and possible route of transmission

(high risk behaviour, needle prick injury, mother to child transmission) and based on their responses, pre-designed proforma was filled, which included both multiple choice and open-ended questions. Multiple counselling sessions were carried out in subsequent visits too, in order to gain their trust and correctly identify the possible source of infection. Data were entered in the Excel sheet, Windows 2013 and then analysed systematically with various parameters like age, gender, level of education, occupation, marital status, probable route of exposure and other risk factors were evaluated as independent variables. For better understanding of the changing trends, the patients were divided in two subgroups: from July 2006 - 31st December 2011 (group A) and 1st January 2012 to 31st December 2019 (group B).

Results

A total of 27,357 patients were registered from July 2006 - December 2019. Total patients alive and on anti-retroviral therapy (ART) in ARTC, Rohtak and 14 LAC (link ART Centres) was 11872 (43.4%). A total of 6,839 patients (24.9%) died until December 2019. Also 3,692 patients (13.5%) on ART were lost to follow up. To add further, 674 (2.46%) patients who had opted out from treatment i.e. voluntarily decided not to take treatment (Table 1). Patients who were earlier not on ART are now being counselled and motivated to initiate HAART as per recent protocol so that every HIV positive patient being treated with HAART for better outcome.

Yearly registration of total HIV patients has been shown in Table 2. There has been increase in the number of patients registered in subsequent years and similar trends have been observed in male as well as female children too. The fall in total number of new registrations in 2019 is a reflection of the new policy norms under which the link ART centres can now independently register patients and start ART. This has been done to have a better outreach to all sections of society especially remote areas. The change in trend of patient registration in the last decade has been enumerated in table 2. The number of patients registered in the ART centre in the second group has almost doubled compared to the first group. It was seen that males outnumbered females in receiving care at ARTC.

The distribution of patients according to their various demographic and socio-economic characteristics is demonstrated in the table 3 and 4. It is evident that majority of patients in Group A were between the age of 25-45 year (52.6%). Similar trend was observed in group B (47.8%). However, the proportion of patients in the 15-25 years age group has increased from group A (26.3%) to group B (35.5%) indicating that younger people are getting affected and diagnosed with HIV in last 5 years.

In both the groups majority of the people were either labourers (23.29% vs. 19.15%) or involved in transport business (bus/cab/taxi/auto-drivers) (21.64% vs. 17.64%). However, the proportion of students has increased strikingly from 3.02% in group A to 13.49% in group B. Similarly, approximately 59.42% of patients were illiterate in group A but the figure decreased to 39.62% in group B. In group B, the level of education status increased compared to group A. People working as truck drivers were the most common risk factor behind acquiring HIV infection in group A. While in group B, migrant population attained a major place in risk factor assessment. This also highlights the fact that there has been a demographic change in the patient population over this decade. Infection among the healthcare workers has reduced over the decade reflecting effectiveness of measures taken such as universal precaution protocols and post exposure prophylaxis. Mother to child transmission has also shown a significant fall (from 5.87% in group A to 3.67% in group B) reflecting the effectiveness of the awareness programs and opt-out policy of HIV testing among pregnant females in which all females are offered HIV testing unless she voluntarily opts out of it. Starting ART during pregnancy to decrease foetal transmission and continuing it during delivery has also shown some dramatic favourable results.

In group A, 82.54% of the patients were from rural areas in Haryana and 17.46% were from urban areas whereas in Group B, patients belonging to urban area have increased to 45.78%. Although in both the groups majority of patients were married, the proportion of divorced patients has increased slightly in the latter group.

The study also revealed that, in group A, HIV prevalence correlated well with the low financial status of the patients, which showed that majority of the patients (65.29%) had income of less than 5000 rupees per month. In group B, the majority of the population (42.64%) earned rupees 5001-10000 per month. The sexual route remained the primary mode of transmission of infection in both the groups.

This study also showed that in group A, the total number of cases of opportunistic infections reported were 10,312, the majority being oral candidiasis (41.93%) and tuberculosis (28.33%). In group B, the total number of cases decreased to 7,220, despite increased number of registration of people suggesting the efficacy of HAART as all patients are now being given therapy irrespective of their immune status (Table-5). 31.26% of patients died in group A whereas the proportion has decreased to 22.1% in group B, a death in HIV is due to multifactorial causes most importantly the opportunistic infections and generalised debility. Fall in death rate is a good indicator of the general health status and disease progression of these patients. (Table-6)

Table 1: Overall distribution of patients (2006-2019)

Parameter	Number of patients (%)
Total number of registered patients	27,357 (100)
Total transferred out patients	2,775 (10.14)
At present total patients registered at ARTC, Rohtak	24,582 (89.9)
Total deaths	6,839 (24.9)
Total patients alive on ART (ARTC, Rohtak + 14 LAC centres)	11,872 (43.4)
Total patients alive on ART at ARTC, Rohtak	9,222 (33.7)
Total patients alive on ART at 14 LACs	2,650 (9.7)
Total LFU (lost to follow up) ON ART	5,232 (19.1)
ON PRE ART	3,692 (13.5)
	1,540 (5.63)
Total Opted out of treatment	674 (2.46)
Total Stopped treatment (on ART)	52 (0.19)
Total patients on pre ART active care at ART centre	1,528 (5.59)

Table 2: Year wise registration of total HIV patients from year 2006-2019

Year	Male		Female		TG	Total	
	Male	Male Child	Female	Female Child			
21 st July 2006-31 st December 2006	203	17	149	3	0	372	8,653
2007	795	77	529	42	0	1,443	
2008	861	75	565	35	1	1,537	
2009	915	81	579	26	1	1,602	
2010	1017	66	638	40	1	1,762	
2011	1138	76	680	43	0	1,937	
2006-2011 (Group A)	5,321 (61.49%)		3,329 (38.47%)		3 (0.04%)	8,653	
2012	1251	66	825	46	1	2,189	18,704
2013	1420	86	907	56	1	2,470	
2014	1412	85	892	70	5	2,464	
2015	1397	56	805	50	3	2,311	
2016	1720	60	854	49	2	2,685	
2017	1571	76	870	30	6	2,553	
2018	1789	64	939	55	4	2,851	
2019	735	28	395	23	0	1,181	
2012-2019 (Group B)	11,816 (63.2%)		6,866 (36.7%)		22 (0.12%)	18,704	

Table 3: Baseline Gender-wise distribution of HIV registered patient in both group on the basis of age, occupation, education level, risk factors and residence.

Years & subgroups		2006-2011 (Group A) n=8,653				2012-19 (Group B) n=18,704			
Age (years)	Males	Females	TG	Total n (%)	Males	Females	TG	Total (%)	
0-5	244	106	0	350 (4.04)	128	108	0	236 (1.26)	
5-15	148	83	0	231 (2.7)	393	271	0	664 (3.6)	
15-25	1,218	1,058	3	2,279 (26.3)	4,292	2,335	18	6,645 (35.5)	
25-45	2,725	1,830	0	4,555 (52.6)	6,099	2,854	4	8,957 (47.8)	
>45	986	252	0	1,238 (14.3)	904	1,298	0	2,202 (11.8)	
Total	5,321	3,329	3	8,653	11,816	6,866	22	18,704	
Occupation									
Labourers	1,526	489	0	2,015 (23.29)	2,905	676	0	3,581 (19.15)	
Housewife	-	1665	0	1,665 (19.25)	-	4,302	0	4,302 (23.01)	
Students (including pre schoolers)	205	56	0	261 (3.02)	1,620	903	0	2,523 (13.49)	
Retired personnel	283	65	0	348 (4.02)	1,115	64	0	1,179 (6.3)	
In service	369	321	0	690 (7.97)	1,154	162	0	1,316 (7.04)	
Transport business	1,856	16	0	1,872 (21.64)	3,282	17	0	3,299 (17.64)	
Self employed	1,082	717	3	1,802 (20.8)	1,740	742	22	2,274 (12.16)	
Total	5,321	3,329	3	8,653	11,816	6,866	22	18,704	
Education Level									
Illiterate	2,941	2199	0	5,140 (59.42)	4,497	2,914	0	7,411 (39.62)	
Primary	1,245	568	3	1,816 (20.9)	2,131	1,588	22	3,741 (20)	
Secondary	658	319	0	977 (11.29)	2,846	1,465	0	4,311 (23.05)	
Graduate	352	215	0	567 (6.55)	1,745	706	0	2,451 (13.1)	
Post graduate	125	28	0	153 (1.77)	597	193	0	790 (4.22)	
Total	5,321	3,329	3	8,653	11,816	6,866	22	18,704	
Risk Factors (* many patients had >1 risk factor; numbers calculated as per the most frequent mode of exposure and most probable route as per patient's history.)									
Female sex workers	0	126	0	126 (1.45)	0	793	0	793 (4.24)	
MSM	125	0	3	128 (1.44)	945	0	22	967 (5.17)	
IDU	106	0	0	106 (1.22)	889	0	0	889 (4.75)	
Migrants	197	524	0	721 (8.33)	2,554	2342	0	4,896 (26.18)	
Truck drivers	1,854	0	0	1,854 (21.43)	4,224	0	0	4,224 (22.58)	
Health care workers	4	21	0	25 (0.14)	1	6	0	7 (0.03)	
Mother to child	348	160	0	508 (5.87)	356	331	0	687 (3.67)	
Others**	2,687	2,498	0	5,185 (59.9)	3,040	3,607	0	6,241 (33.37)	
Total	5,321	3,329	3	8,653	11,816	6,866	22	18,704	
** includes patients with multiple sexual partners and high risk sexual behaviour, history of blood transfusion, tattooing, getting injectable treatment from quacks using unsterilized needles and other unknown mode of transmission)									
Residence									
Urban	1,254	256	3	1,513 (17.46)	6,873	1,668	22	8,563 (45.78)	
Rural	4,067	3,073	0	7,140 (82.54)	4,943	5,198	0	10,141 (54.22)	
Total	5,321	3,329	3	8,653	11,816	6,866	22	18,704	

Table 4: Baseline Gender-wise distribution of HIV registered patient on the basis of Marital status, Income and Route of infection in HIV patients in both Group

Parameters	2006-2011 (Group A)			n=8653	2012-19 (Group B)			n=18704
	Males	Females	TG	Total No (%)	Males	Females	TG	Total No (%)
Marital status								
Married	4,123	2,489	0	6,612 (76.44)	7,695	5,134	0	12,829 (68.59)
Single	1,089	650	3	1,742 (20.10)	3,314	1,603	21	4,938 (26.4)
Divorced	109	190	0	299 (3.46)	807	129	1	937 (5.0)
Total	5,321	3,329	3	8,653	11,816	6,866	22	18,704
Monthly Income (In Rupees)								
< 5000	2,963	2,685	3	5,651 (65.29)	3,281 (17.60)	2,689 (14.79)	14	5,984 (31.99)
5001-10000	1,342	545	0	1,887 (21.81)	5,667	2,300	8	7,975 (42.64)
10001-20000	682	50	0	732 (8.46)	1,325	1,424	0	2,749 (14.7)
20001-30000	248	49	0	297 (3.44)	1,159	395	0	1,554 (8.3)
>30000	86	0	0	86 (0.99)	384	58	0	442 (2.36)
Total	5,321	3,329	3	8,653	11,816	6,866	22	18,704
Possible routes of infection <small>(**the numbers are an approximation based on patient's history as many patients had multiple risk factors and the most probable one is counted for the individual)</small>								
Sexual	3,695	2,664	3	6,362 (73.52)	7,848	3,820	22	11,690 (62.5)
Blood products	658	336	0	994 (11.49)	1,611	1,287	0	2898 (15.49)
Needle stick injury	224	143	0	367 (4.24)	1,090	757	0	1,847 (9.87)
Mother to child	348	160	0	508 = (5.87)	356	331	0	687 (3.67)
Others	396	26	0	422 = (4.88)	911	671	0	1582 (8.46)
Total	5,321	3,329	3	8,653	11,816	6,866	22	18,704

Table 5: Distribution of Opportunistic infections among both groups

Opportunistic infection	Year 2006-2011 (Group A) N = 8,653		Year 2012-2019 (Group B) N = 18,704		Total
	Number	%	Number	%	
Tuberculosis	2,451	28.33	1,733	9.26	5,309
Respiratory infections (other than T.B.)	945	10.92	1,037	5.54	1,982
Parasitic & other infections like cryptococcal, toxoplasma, mucormycosis, histoplasma infection	414	4.78	655	3.5	1,069
Candidiasis					
Oral	3,628	41.93	2,498	13.39	6,126
Oesophageal	440	5.08	380	20.3	820
GIT infection like Diarrhoea etc. other than candidiasis	1,309	15.13	917	4.9	2,226

* Percentages were calculated according to the total number of registered patients: lost to follow up & deaths were not accounted for while calculating.

** many patients had more than one opportunistic infection.

Table 6: Gender-wise distribution of death in both groups

YEAR	Males	Females	TG	Total (%)
2006-2011 (Group A) (n=8,653)	2,004	701	0	2705 (31.26)
2012-2019 (Group B) (n=18,704)	3,057	1075	2	4134 (22.1)

Discussion

In 1986, the first known case of HIV was diagnosed in India by Dr. Suniti Solomon amongst the female sex workers in Chennai, Tamilnadu. Thereafter, this disease spread rapidly like an epidemic in our country. The chief factors that led to India's large HIV-infected population were widespread labour migration, low literacy levels particularly in rural settings, intravenous drug use and prostitution, especially in North-East India and certain urban areas, so these cohorts were identified among others as the major high risks categories which needed special intervention in order to stop the rising numbers of PLWHA. Free ART programme was started by Government of India on 1st April 2004, initiating in eight tertiary level government hospitals in the six high prevalent states like Andhra Pradesh, Karnataka, Maharashtra, Tamilnadu, Manipur and Nagaland [4]. Currently, 400 ART centres and 840 Link ART centres primarily established for dispensing anti-retroviral drugs, monitoring side effects and treating minor opportunistic infections are functioning across the country. HIV is a multi-dimensional epidemic and is affected by demographic, socio-cultural, behavioural, economic and biological factors [5]. Increased awareness about the disease and prompt initiation of ART have significantly decreased HIV transmission [6,7].

The geographic distribution of HIV in India is varied; hence it is necessary to study various socio-demographic factors and analyse their changing trends from a particular area. Overall, India has witnessed a decrease in HIV prevalence over the years [1]. However, Haryana in spite of being a low prevalence state, has witnessed an increase in number of registrations of PLHIV over the years. This may be accounted to intense health education, widespread social awareness campaigns and improved pre-test counselling which have led to increased voluntary testing and contact tracing.

In this study, the majority of the patients registered in ARTC are males in both the groups. This is in accordance with other studies from India and also with national data [3,8,9]. The low turnout of women could be due to lesser independence and more restrictions imposed upon them, thus making them ignorant to sexually transmitted diseases like HIV [10,11]. Increased education and awareness amongst the female population and more vigilant antenatal check-up of pregnant women can help in removing this barrier.

In the current study, majority of the patients were in the age group of 25 to 45 years which is the sexually active and economically productive age group. Heterosexual mode of transmission is the most common route of transmission in India as reported in NACO, which explains

the highest prevalence of HIV in this age group. It is important to note that in group B, increasing number of young people, who belong to 15-25 years of age group have been diagnosed with this disease which is in concordance with another study from AIIMS, New Delhi [12]. The adolescents are a vulnerable population group who have less knowledge about safe sexual practices and often get involved in high-risk behaviours. This is extremely important as not only do they constitute a new generation of infected individuals who are native and dependant on others for care, but also demand specialised prevention strategies to halt further spread of the disease. This is also the child bearing age group and provide increased threat to vertical transmission of HIV. Even in the United States, youth aged 13- 24 accounted for an estimated 26% of all new HIV infections [13]. Various studies carried out on antenatal mothers in India have reported a higher positivity in the younger age group [14]. Introduction of sexual health and hygiene, basic knowledge of sexually transmitted infections, their prevention and treatment in the school text books curriculum can spread awareness among this population. The schools should also arrange health camps for free discussions, health check-ups and provision of facilities for voluntary testing.

In the recent years, there has also been a shift of patient population towards more urban settings. In the earlier studies, the majority of the study individuals belonged to rural areas [15,16]. The contraction and transmission of the disease were mostly mediated by migrating male population, labourers as well as truckers [17,18]. Similarly in our study, 82.54% of people belonged to rural areas of Haryana in group A, whereas nearly 45.78% of patients in group B belong to an urban background and 54.8% were from rural areas. This is in accordance with a study from Mumbai, where 41% of PLHIV were from urban India [5]. Increased job opportunities and better income, security and education facilities drive huge population from rural areas to migrate and settle in urban places in recent years. Rohtak being close proximity to national capital and educational hub gets a lot of migrant workers, students from all over India. These people being stay away from family and often indulge in high-risk behaviours [19]. Slum dwellers are often deprived of their basic amenities of life like food, shelter, clean water and good sanitation. This promotes people to indulge in alcoholism and unsafe sexual practices. This could be the reason of the rising trend of infected people from urban background in the later years of our study. More health camps and awareness campaigns should be arranged directed to the slums and overcrowded areas in the cities for better penetration of knowledge regarding the disease and diagnostic facilities amongst this population.

Socio-economic status is usually measured by the income,

occupation and education of an individual. It is one of the most powerful predictors of sickness and health [20]. High risk behaviours are also shaped in the context of these demographic factors like age, gender, occupation, education and marital status. People with lesser income and lesser education have low exposure to social awareness campaigns, educational materials and health camps and are more likely to contract and transmit HIV infection. This explains the predominance of illiterate population in group A. This is in accordance to a study which has shown illiterate people had 2.2 times more chance of being HIV positive [5]. Various other studies also reveal that majority of the patients were daily wage workers in the low socio-economic background [5,8,15]. HIV is a preventable disease and increased awareness and knowledge about the disease is very essential to prevent the transmission. School sex education, community participation, printed media and street-plays should be promoted to percolate the information through the grass root levels of the society to this population.

Compared to married individuals, divorced, separated and widowed individuals had a significantly higher risk of acquiring infection [5]. Furthermore, males in particular were observed to initially contract the disease and transmit to their spouses. So, most of the females could have perhaps acquired the infection from their spouses [21,22]. In the current study, unprotected heterosexual contact was the most common mode of transmission of HIV followed by infected blood products and needle stick injury. There have been similar trends in the route of transmission over this decade and this is in accordance with various studies across India [4,5,8,15].

In the present study, certain opportunistic infections were more common than other like oral candidiasis and tuberculosis and this is in concordance with other studies [23,24]. Lower absolute CD4+ T-lymphocyte count below 200 cell/cu.mm has been cited as the greatest risk factor for the development of oropharyngeal candidiasis as per current guidelines [24]. HIV infection is not only associated with increased colonization rates but also with the development of overt disease. Although the introduction of ART has had a major positive impact on the infectious complications of AIDS, candidiasis still remains a common opportunistic infection in HIV-infected patients [25]. Also according to the WHO, the risk of developing tuberculosis (TB) is estimated to be between 26-31 times greater in PLHIV than among those without HIV infection. HIV not only increases the risk of reactivating latent Mycobacterium tuberculosis, it also increases the risk of rapid progression of TB soon after infection or re-infection [26]. The Government of India has greatly facilitated free provision of Isoniazid preventive therapy to all PLHIV patients on ART with an aim to reduce the re-activation of latent

tuberculosis in these individuals. A large cohort of patients also came with the complaints of chronic diarrhoea and is in line with the fact that intestinal parasitic disease is the commonest and are a major cause of morbidity and mortality in HIV positive individuals worldwide [27]. The last decade has witnessed a rise in infections by Cryptococcus, Isospora, atypical Mycobacterium which may be accounted to better availability of diagnostic facilities.

A person living with HIV (PLHIV) becomes helpless; feels neglected, ignored, isolated especially during job interviews and social gatherings. Not only this, but due to low confidence and self-belief as a result of social stigmata associated with this disease and social discrimination limits their self-accessing of facilities provided by the government. Some patients discontinue their medications and get lost to follow up due to reasons such as family pressure, social stigma associated with coming to ART centre, domestic violence, increase in the severity of the illness, death of the spouse, inability to come to the centre alone, neglect by the care taker of the patient, personal tragedies like accidents, death of loved ones and dissatisfaction with the system, medicine side effects and other unspecified causes. Given these facts, constant motivation from counsellors as well as doctors, continuous supply of medicines, strong inter-departmental referral system and a comprehensive health care system is required to trace back and prevent further loss of patients.

We need a better social protection for these patients, strict laws to protect the rights of these individuals, an informative educational system, an openness on the part of the society to accept them and seeing this disease as like other chronic manageable disease rather than a social stigma or embarrassment. There is utmost need to percolate the education and information regarding this disease at ground level, and to develop a more targeted approach towards particular groups like sex workers, migrant workers, labourers, housewives as well as adolescents. The importance of school sex education should be emphasized. Strict laws should be formed and implemented for the social development and protection, provision of fair opportunities, and some additional benefits like health insurance, social security, access to adequate healthcare, travel support, pension plans, legal aids and nutritional support for the infected population. In the end, everyone in the society should work in harmony, with the government to implement these approaches to successfully halt the progression of this disease.

There were certain limitations of the study. This was a cross-sectional retrospective study so, results cannot be generalised. Also, during the personal interviews, the patients may not have given the answers in the honest

possible way or may have concealed certain facts regarding their sexual behaviour. Other limitations include the fact that no information was collected regarding the number of sexual partners, contraception use or sexually transmitted infections, which could have better assessed the risk factors.

Conclusion

The impact of HIV infection is not only on the immune status but also on the entire socio-economic built up of the patients and their family. Knowing the lifelong course of the disease the most valuable intervention has to be a strong preventive strategy. Targeting of high-risk sections can only be done if they are identified correctly. With each decade face of the epidemic is changing and thus the target groups and risk factors are also different. Thus, more studies are needed from different parts of the world covering all sections of society to know the current and changing demographics of the people living with HIV.

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