

HIV epidemic in Punjab, India: time trends over a decade

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Although Bombay (Mumbai) appears to be the main focus for acquired immunodeficiency syndrome (AIDS) in India, rapid spread has occurred through other major cities as well. The first AIDS patient in the northern state of Punjab was reported in May 1987. The present study, spanning a decade, shows that the incidence in high-risk groups increased from 3 per 1000 in 1987 to 59 per 1000 in 1997, 73% of the cases being in the third and fourth decades of life, i.e. the most productive years. The male to female ratio was 3.1:1, and 29% of the patients had the full-blown disease. A total of 80.5% acquired the infection heterosexually and only 2% of the patients were intravenous drug users. The percentage of patients acquiring infection through blood, blood products, and haemodialysis dropped from 20% in 1987 to 5% in 1997, but the cumulative figure was still 12%.

The intervention programme launched by the National AIDS Control Organization (NACO) appears to have had little impact on the epidemic. There is an urgent need therefore for more interactive programmes that include education concerning the modes of spread, course, financial implications and fatal outcome of the disease, instead of passive dissemination of information by posters and the media.

Introduction

After the first report of human immunodeficiency virus (HIV) infection in a sex worker in Madras (1), the prevalence of HIV increased rapidly in the states of Tamil Nadu (2), Maharashtra (3-5), and Manipur (6). The first HIV seropositive case in the state of Punjab was reported in 1987 in a patient with genital herpes, molluscum contagiosum and oesophageal candidiasis (7), the initial cases in Punjab being diagnosed in individuals returning from high-risk countries, e.g. Congo, Uganda, Zambia, USA, etc. (8). Subsequently, more and more cases were diagnosed in persons who had never visited a high-risk country.

The state of Punjab, with a population of approximately 20 million, is crossed by national and international traffic. There is constant movement along the highways to and from Maharashtra and Tamil Nadu via the states of Rajasthan, Madhya Pradesh and Gujarat. The epidemic has thus spread by road from the high-risk areas to Punjab (9, 10) and the surrounding states where long-distance truck driving is a common occupation. Massive intervention programmes launched by the National AIDS Control Organization (NACO) on a population with a reasonable literacy rate of 57% have made very little impact so far on the epidemic. This article

describes the time trends of HIV and acquired immunodeficiency syndrome (AIDS) in Punjab over the last decade, as reported by the Surveillance Centre of the Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, in the context of the national situation.

Patients and methods

All patients with high-risk behaviour, especially those employed away from home in high-risk areas and those suspected to have AIDS, their spouses and children (<5 years), were screened for HIV infection. All patients undergoing renal transplantation, attending a sexually transmitted disease clinic or presenting with unexplained opportunistic infections, such as oral candidiasis or chronic diarrhoea and wasting, were also included. Patients with a history of drug abuse, multiple blood transfusions (especially individuals with thalassaemia or haemophilia), and those with promiscuous behaviour, particularly truck drivers visiting sex workers in Bombay, Madras, Manipur and Gujarat, were also screened for their HIV serostatus.

Before 1993, all patients were examined by enzyme-linked immunosorbent assay (ELISA) followed by a confirmatory Western blot assay. From 1994 onwards, however, every ELISA-positive case was confirmed by another ELISA plus a rapid test. The various ELISA kits used were UBI (United Biomedical Inc., Hauppauge, USA), Detect (Biochem Immunology, Montreal, Canada) and

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Recombigen (Cambridge Biotech, Galway, Ireland). The rapid tests used included Immunocomb (Organic, Yavne, Israel), Capillus (Cambridge Biotech, Galway, Ireland) and Tridot (J. Mitra & Co., New Delhi, India). In the case of even a minor discord, a Western blot assay was performed to confirm the diagnosis. WHO criteria were used for interpretation of Western blot (11); a patient was diagnosed as full-blown AIDS according to revised CDC criteria (12). In some cases CD4 estimation was carried out; if the count was less than 200×10^6 per litre, the diagnosis was taken to be AIDS.

Results

Between May 1987 and December 1996, a total of 29696 high-risk persons were screened for HIV; 656 were detected positive with an overall rate of 23 per 1000. Of these 656 cases, 34 were foreign students and 622 were Indians; the foreign students were excluded from our analysis of time trends. The rate increased from 0.3 per 1000 in 1987 to 59 per 1000 in 1996. The number of cases detected during the first 5 years was 66; in the second 5 years there was a nearly ninefold increase to 556 cases.

Of these 622 cases, 470 were males and 152 were females (male to female ratio of 3.1:1). Fig. 1 illustrates the number of HIV-positive cases in 1987–96 registered at the PGIMER Surveillance Centre. Their ages ranged from 8 months to 60 years; 49.5% of patients were in the third decade, 23.6% in the fourth decade, 16.6% >40 years, and 10.3% <20 years of age. Fig. 2 illustrates the age and sex distribution of HIV-positive patients. A total of 80% of the cases came from the state of Punjab; the rest from the adjoining states of Haryana, Himachal Pradesh and Uttar Pradesh.

Fig. 1. Number of HIV-positive and AIDS cases in Punjab, 1987–96.

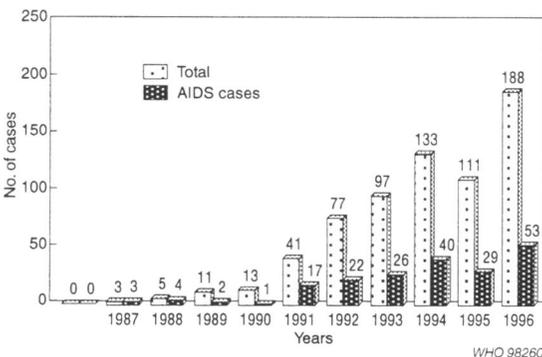
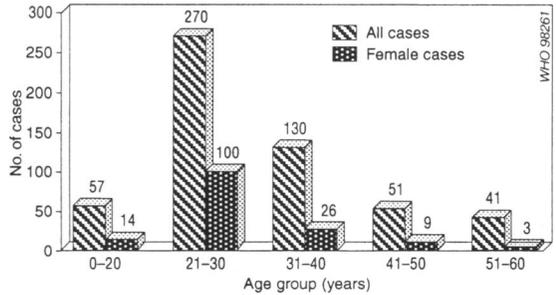


Fig. 2. Distribution of HIV-positive and AIDS cases in Punjab, by age group and sex.



At least 29% of the patients presented with full-blown disease, which is much higher than reported by other states as documented by the National AIDS Control Organization (13).

Modes of transmission. A total of 65% of patients acquired HIV through heterosexual promiscuous behaviour and 15.5% from infected spouses; overall, heterosexual transmission thus accounted for 80.5%. Nearly 12% of the patients acquired HIV after blood transfusion or renal transplant surgery, and 3.5% (mainly infants and children <5 years) acquired the infection from the mother. Only 2% of patients acquired the disease through intravenous drug abuse. In 2% of patients, there were multiple or unknown risk factors; homosexuality was suspected in four patients because of anal fistulae, fissures and condylomata, and a history of bisexuality was apparent in only one case. These cases were included under the “unknown” or multiple risk groups (Fig. 3).

Data for 1987–92 indicated that 21.4% of patients had acquired the disease through infected

Fig. 3. Routes of HIV transmission in Punjab and their frequency.

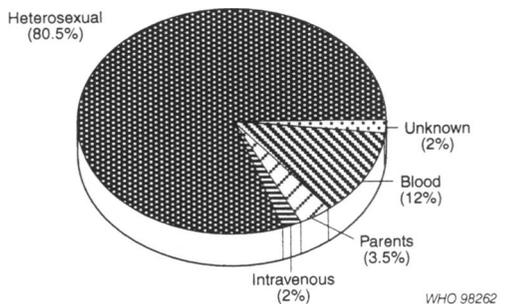


Table 1: Data on HIV infection from 1987 to 1996, as reported by the Surveillance Centre, PGIMER, Chandigarh

Year	No. infected	No. of females	No. of bloodborne cases
1987-92	139	33 (23.7) ^a	29 (21.4) ^a
1993	79	18 (22.8)	13 (13.0)
1994	116	28 (24.1)	10 (8.6)
1995	107	24 (22.4)	10 (9.3)
1996	181	49 (27.0)	9 (5.0)
Total	622	152 (24.4)	71 (11.4)

^a Figures in parentheses are percentages.

blood (Table 1). This proportion dropped to 13% in 1993 and 5% by 1996, but the overall positivity rate was approximately 12%, which is much higher than the comprehensive national figures reported by the National AIDS Control Organization (NACO) (13).

Discussion

By June 1997, it was estimated that globally 22.6 million adults were alive and infected with HIV or had AIDS (14), and that nearly 10000 new infections were occurring each day. In India, NACO was given a thrust in 1991 by the Ministry of Health and 62 surveillance centres and 150 zonal blood-testing centres were set up throughout the country, supported by nine regional reference centres. Despite aggressive measures, these interventions have had practically very little impact on the course of the epidemic.

By July 1997, NACO reported a total of 4828 cases of full-blown AIDS and 66315 HIV seropositives from a total of 3147598 persons screened (15). The NACO screening programme included low-risk individuals such as blood donors and the above numbers may be a considerable underestimate. NACO also reported that 6.8% of patients acquired AIDS through blood and blood products, while only 1.3% of seropositives had been infected by this route. In one study, Solomon et al. (16) assessed the time trends between December 1989 and March 1993 and documented a tenfold rise in positive HIV serostatus among patients attending STD clinics, a twofold rise among women attending antenatal clinics, and a threefold rise among blood donors. There is no published longitudinal study spanning a decade from other centres in India. There are, however, several studies of the point prevalence among high-risk groups (17); a strict comparison be-

tween earlier studies and the present study cannot therefore be made.

In Punjab, we observed a declining rate of bloodborne HIV infection from 21.4% in 1987 to nearly 5% in 1996, but the latter rate refers only to index cases. In addition to these, heterosexual spread has also occurred between index cases and their spouses. A classic example is transfusion with infected blood during a miscarriage, a Caesarean section or an abortion, and subsequent HIV infection of the husband. Similarly, children born to such HIV-positive mothers would be counted as mother-to-child transmission although the origin was the infected blood. Thus the true rate of bloodborne infections is much higher than 5%.

This situation possibly arose because of the illegal sale of blood throughout India in the past, despite compulsory registration of blood banks and mandatory HIV testing. The second important observation in this study is the ratio of full-blown AIDS to seropositives. In general, 10% of seropositive individuals have AIDS, but the 29% in our study is very high indeed. If healthy spouses who were traced from index cases are excluded, the percentage of full-blown cases would be higher still. These levels differ greatly from those reported by NACO (4828 full-blown AIDS cases against 66315 seropositives). There could be two reasons for such a discrepancy. First, our data were generated primarily from a referral hospital-based population where both clinicians and laboratory personnel are fully aware of the growing AIDS pandemic and its varied clinical presentations. Second, and perhaps equally important, is that since a significant proportion of full-blown AIDS cases present as tuberculosis, only the latter is treated by private practitioners and state hospitals without suspecting HIV infection. In one of our own studies, 54% of AIDS patients presented with tuberculosis (18) and the diagnosis could easily have been missed. In addition, Kaposi's sarcoma is almost unknown in Indian patients and pneumocystis pneumonia is uncommon; these two conditions have been major clinical leads to HIV infection in developed countries.

Furthermore, HIV infections may run a more florid course in Indian patients since 29% had the full-blown disease. Only 5.0% of our patients could afford, at best, a single anti-retroviral drug; even antitubercular drugs are too expensive for many patients. Poor compliance, financial constraints, malnutrition, illiteracy, and ignorance about the disease could all hasten the development of full-blown AIDS. A study of the sequential viral burden in these patients could establish whether the natural history of HIV is indeed different in Indian patients. We have previously shown that the predominant

strain of HIV in Punjab belongs to the "C" groups of viruses (19, 20), which is related to the South African strains. So far, there is no authentic report that different HIV clades have different biological behaviour.

At the time of compiling our data, 230 HIV-infected individuals had already been detected during 1997, and the number for 1998 is expected to exceed 280. At the surveillance centre in Chandigarh, more than 80% of the cases were reported from Punjab and the rest from the adjoining states of Haryana and Himachal Pradesh. The Union Territory of Chandigarh, however, had a much lower incidence of HIV cases.

Thus, a decade of observation in Punjab has revealed an alarming rise of HIV, primarily through heterosexual spread and infected blood or blood products among individuals in their most productive years of life, since 73% of patients were in their third and fourth decades. The proportion of patients with full-blown AIDS is much higher than that reported from other parts of India or abroad. There is urgent need for an aggressive, interactive intervention programme to cater to the vast numbers of the uneducated and to high-risk groups, instead of passive dissemination of information through radio and television broadcasts or posters.

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Résumé

Epidémie de VIH au Pendjab, Inde: tendances sur une décennie

S'il semble que Bombay (Mumbai) représente le principal foyer de syndrome d'immunodéficience acquise (SIDA) en Inde, on assiste à une extension rapide de l'infection dans les autres grandes villes. Le premier cas de SIDA dans l'Etat du Pendjab, dans le nord du pays, a été notifié en 1987. La présente étude, qui couvre une période de dix ans, montre que l'incidence de l'infection à VIH dans les groupes à haut risque est passée de 3 pour 1000 en 1987 à 59 pour 1000 en 1997, 73% des cas étant âgés de 20 à 40 ans, c'est-à-dire les années les plus productives. Le sex ratio était de 3,1:1 et 29% des cas présentaient un SIDA avéré. Au total,

80,5% des sujets avaient contracté l'infection par voie hétérosexuelle et seuls 2% étaient des usagers de drogues intraveineuses. Le pourcentage de sujets ayant contracté l'infection par du sang, des produits sanguins ou lors d'une hémodialyse est tombé de 20% en 1987 à 5% en 1997, mais le taux cumulé était toujours de 12%.

Le programme d'intervention lancé par la National AIDS Control Organization (NACO) semble avoir eu peu d'impact sur l'épidémie. Il est donc urgent de disposer de programmes plus interactifs avec un volet éducatif portant sur les modes de propagation de l'infection, son évolution, ses conséquences financières et son issue fatale, au lieu de se contenter de diffuser des informations sous forme d'affiches et dans les médias auprès de populations de faible niveau d'instruction.

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