Original Article

High prevalence of HIV infection among injection drug users (IDUs) in Hyderabad and Sukkur, Pakistan

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Abstract

Objective: To estimate size of injection drug users (IDU), determine their high risk behaviours and assess the prevalence of HIV.

Method: As part of second generation surveillance (SGS), we investigated specific demographic and behavioural characteristics of IDUs in Hyderabad and Sukkur in 2005. It was a cross sectional study. The survey was preceded by geographic mapping to determine size estimation and to define sampling procedures prior to integrated behavioural and biological survey (IBBS). A sample size of at least 400 was calculated for each city. Besides calculating frequencies, chi square was used for comparing variables among HIV positive and negative IDUs like time elapsed as IDU, number of injections, sharing needles and self perception of acquiring HIV infection.

Results: A total of 800 (Hyderabad 398; Sukkur 402) questionnaires and DBS samples were collected. The estimated number of IDUs in both cities was 3,225 (Hyderabad 975 and Sukkur 2250 respectively). Average age of IDUs in Hyderabad was 36.5 years and 34.6 years in Sukkur. Sharing of injection equipment for last injection was reported by 34 (8.5%) in Hyderabad and 135 (33.6%) in Sukkur. In both cities behaviours such as injecting drugs for more than 10 years (p=0.00) and injecting four or more times in a day (p=0.11) were significantly associated with seropositivity of HIV infection. In Hyderabad the seroprevalence of HIV was 25.4% (101/398) and in Sukkur it was 19.2% (77/402).

Conclusion: The burden of HIV among IDUs in Hyderabad and Sukkur is extremely high and can play a significant role in transmitting the infection to other vulnerable groups (JPMA 59:136; 2009).

Introduction

Injection drug users (IDUs) in Pakistan are posing a serious risk to the country's healthcare system. The prevalence of opioid use in the country is estimated at around 628,000.[1] Out of these around 484,000 (77%) are heroin users.[2] There is also an increased shift towards injecting drug use among drug addicts in the country.[3] The problems associated with heroin use in Pakistan are aggravated due to the country's widespread porous border with Afghanistan, one of largest opium producers.[4] However, fluctuations in heroin availability, purity and price have led many heroin addicts to change over to injecting drug use.[5] Other studies have also identified factors that have been associated with injecting synthetic drugs. In Quetta and Lahore in 2003, factors such as using drugs in groups or sharing snorting/chasing tools were associated with recent onset of injections.[6] Two different case control studies in Lahore and Larkana in 2003 have assessed correlates of injection drugs use and HIV transmission. They have identified risk factors such as presence of an IDU friend, reuse of syringe, cost of current drug and poly drug use.[7,8] IDUs are using a combination of products depending upon its availability. Most common narcotics used besides heroin are pharmaceutical combination of Diazepam, Lorazepam and Pheniramine.[9]

The prevalence of HIV among IDUs suggests alarm. Family Health International (FHI) sponsored a cross sectional study in 2002-2003 which indicated 23% seroprevalence in Karachi,[10] the largest metropolis. Since 2004 the Canadian International Development Agency (CIDA) has been supporting HIV/AIDS Surveillance Project (HASP) which works closely with the National and Provincial AIDS Control Programmes of the country. HASP is a five years capacity building project which aims to establish and strengthen second generation surveillance for HIV infection in the country.

According to the World Health Organization (WHO)[11] the main features of second generation HIV infection surveillance include:

1. Tailoring of a more flexible surveillance system to the needs and state of the epidemic (such as low-level epidemic, concentrated epidemic affecting primarily some groups of population, and generalized epidemic with spread of the infection among the general population) to the real epidemiological situation in various countries and to the available resources.

2. Improving the integration of HIV biological

surveillance with behavioural risk surveillance.

3. Supporting continuous research into new epidemiological tools, improved methods for building estimates and modeling the epidemic, and better ways of using data for advocacy, planning, monitoring and evaluation purposes.

4. Improving efficiency and widening the scope of the existing national surveillance systems.

Findings of second generation surveillance (SGS) conducted in Pakistan in two rounds in 2006 and 2007 indicate presence of HIV positive IDUs in more than eight cities in all four provinces of the country.[12,13] The findings of the surveillance have also established the fact that Pakistan has progressed from low to concentrated level of the epidemic.

The HIV/AIDS Surveillance Project prior to its on ground operation had a detailed consultative process in 2002 in which all key stakeholders participated. One of the objectives of this meeting was to finalize the most at risk population in Pakistan which had the potential to drive the HIV epidemic in the country. Following this consultative process the high risk groups which would be targeted in the second generation surveillance were finalized. The present study was conducted in 2005 as part of the second generation surveillance exercise to estimate the size of four key sub populations, female sex workers (FSW), male sex workers (MSW), hijra sex workers (HSW) and IDU, in three cities of Sindh province of Pakistan. This paper documents the size of IDUs, their high risk behaviours and seroprevalence of HIV in Sukkur and Hyderabad. At the time of writing this manuscript no other literature is available with reference to these two important cities of Sindh province.

Methodology

As part of second generation surveillance (SGS), we investigated specific demographic and behavioural characteristics of IDUs in Hyderabad and Sukkur in 2005. It was a cross sectional study. The survey was preceded by geographic mapping in order to reach size estimation and to define sampling procedures prior to integrated behavioural and biological survey (IBBS). Time location cluster sampling was used to recruit the study subjects. Detailed questionnaire and dry blood spot (DBS) specimen for HIV testing were collected by trained interviewers after informed consent. A sample size of at least 400 was calculated for each city.

Hyderabad is the second largest city of Sindh province and is located 175 kilometers north of Karachi. According to the Population Welfare Department, Government of Sindh, the population of Hyderabad is estimated to be around 1.4 million. The city is a gateway between the rural Sindh and the Greater Sindh. It is also an important commercial centre where industries include textiles, sugar, cement, manufacturing of glass, soap, ice, paper, pottery, plastics, tanneries, hosiery mills and film. Hyderabad produces almost all of the ornamental glass bangles in Pakistan. It is also a major commercial centre for the agricultural produce of the surrounding area, including millet, rice, wheat, cotton, and fruit.[14]

Sukkur is also the third largest city of Sindh and is situated 400 kilometers north of Karachi. It is located on west bank of river Indus and it also has one of the largest barrage systems of Asia which is used for irrigation. It has population of about 908,373. Sukkur had a large fertile and cultivable land till few decades ago, when the Indus river was not as barren as today. Now its agricultural productivity has much reduced. There are small-scale cottage industries comprising of hosiery, boat making, fishing accessories, thread ball spooling, trunk making brass-wares, cutlery and ceramics. Sukkur is famous world over, for its delicious dates. It is also holds a large number of Riveraine forest on the course of Indus. These tropical forests are found within the protective embankments on either side of Indus.[15]

Case definition

The definition for an IDU was a person who had injected drugs, for non-therapeutic purposes in the past six months. Exclusion criteria were subjects below 18 years age, not willing to participate, intoxicated and in the interviewers judgment incapable of understanding the information needed for the survey.

Sample size

The following formula was used to determine the sample size for target groups:

$$n = D\frac{\left[\sqrt{2P(1-P)}Z_{1-\alpha} + \sqrt{P_1(1-P_1) + P_2(1-P_2)}Z_{1-\beta}\right]}{\Delta^2}$$

Sample sizes for each high risk group was calculated based on assumptions in which baseline prevalence and expected change in prevalence were varied to get a maximum sample size:

P1 = estimated prevalence at baseline was set at 50% to achieve the highest sample size.

P2 = expected prevalence in future (detect a change of 10-15%)

P = (P1 + P2) / 2;

Δ2 = (P2 - P1)2

Z1-α= 95% level of significance

Z1-β= Power of the study set at 80%

Based on the calculations, a total number of 340 to 388 individuals from each target group were required for a meaningful analysis. Keeping in view the refusal and

rejection, it was rounded to 400 persons.

Sampling strategy

Time location cluster sampling was used as the sampling strategy. This approach has been increasingly used in recent years. It takes advantage of the fact that some hidden population who tend to gather or congregate at certain types of locations for example in case of IDUs those spots where they congregate and shoot drugs at specific times are included.[16] In time location cluster sampling these spots are enumerated first in a geographic mapping exercise as done in our study also. The list of spots was used as sampling frame to choose a probability sample found at the spots during a pre defined time interval.

All interviews were conducted in the field in a van. The van had curtains installed on the windows and only the interviewer and the respondent were present in the vehicle at the time of the interview.

Biological testing

Blood samples were collected by "Dried Blood Specimen" (DBS) methodology. DBS was collected using self retracting lancets. The interviewers had received training in DBS collection and universal precautions.

All DBS specimens were tested for HIV antibodies at Molecular Diagnostics and Immunology Laboratory of Sindh Institute of Urology and Transplantation (SIUT). All DBS specimens were screened by an EIA (Enzyme immunoassay); HIV Genetic Systems rLAV EIA (Bio-Rad USA) (in single wells). Samples that tested positive by the screening test were tested in duplicate wells by the second EIA (Vironostika HIV Uni-Form II; Biomeriux, The Netherlands). Specimens positive by the second EIA were confirmed by the Western Blot (Genetic Systems HIV-1 Western Blot; Bio-Rad USA).

Data management

Forms of mapping and IBBS were edited accordingly. Mapping forms were edited the same evening or next morning for mistakes incurred in identifying names of spots, missing type of key informant or estimate at each spot. All those forms that did not have estimates were rejected. The mean of minimum and maximum was used as the final estimate.

Forms of IBBS were edited twice a week by the same interviewers and their supervisors in each city for eligibility and completing any missing variables.

Data were entered using Epi Info 6 and SPSS version 12 was used for further analysis.

Results

The estimated number of IDUs in Hyderabad and Sukkur was 3,225 (975 and 2250 respectively) with a total of 208 hot spots in each city. A total of 800 questionnaires (Hyderabad 398 and Sukkur 402) and DBS samples were collected from two cities.

Key demographic and behavioural characteristics are presented in tables 1 and 2. The average age of IDUs in Hyderabad was 36.5 years while in Sukkur it was 34.6 years. Majority of IDUs in Hyderabad and Sukkur were uneducated (53.8% and 51%).

Table 1: Key Socio demographic and injection use behaviors of IDUs in Hyderabad and Sukkur.

Variable	Hyderabad (N=398)	%	Sukkur (N=402)	%
Age of participants categories				
Up to 30 years	24.1	24.1	196	48.8
> 30 years	75.9	75.9	206	51.2
Educational level				
No formal education	53.8	53.8	205	51.0
Five years of education	32.4	32.4	98	24.4
Marital Status				
Unmarried	57.0	57.0	202	50.2
Married	41.0	41.0	182	45.3
Ethnicity				
Urdu	45.5	45.5	36	9.0
Punjabi	11.8	11.8	42	10.4
Sindhi	33.9	33.9	270	67.2
Pushto	1.5	1.5	20	5.0
Living arrangement				
Home	36.7	36.7	266	66.2
Hostel	5.5	5.5	10	2.5
Mazar	41.5	41.5	40	10.0
Street	16.3	16.3	86	21.4
Time elapsed as an IDU				
Up to 5 years	30.4	30.4	249	61.9
5-10 years	32.4	32.4	102	25.4
>10 years	37.2	37.2	51	12.7
Number of times injected drugs in a day				
Once	10.1	10.1	53	13.2
2-3	62.8	62.8	314	78.1
4 or more	108	27.1	35	8.7
Shared used syringe when injected drug last time				
Yes	34	8.5	135	33.6
No	24	6.0	53	13.2
Do not know	62	15.6	12	3.0
No response	278	69.8	202	50.2
Used a new syringe in the past one month				
Always	33	8.3	29	7.3
Mostly	55	13.9	35	8.8
Occasionally	217	54.8	218	54.5
Never	93	23.3	120	29.8
Used a new syringe in last injection				
Yes	221	55.5	80	19.9
No	177	44.4	312	77.6
Do not Know			9	2.2
No response			1	0.2

Marital status slightly varied in the two cities as in Hyderabad (57%) were unmarried where as in Sukkur (50.2%) were unmarried. Sindhi (33.9%), Urdu (45.5%) and

Table 2: Key sexual behaviors and knowledge about STI/HIV among IDUs in Hyderabad and Sukkur.

Variable	Hyderabad (N=398)	%	Sukkur (N=402)	%
Sexual activity with the wife or women living with in the past six month				
Yes	90	22.6	204	50.7
No	277	69.6	163	40.5
No response	31	7.8	35	8.7
Used condom in the last sexual activity with the women or wife are living with				
Yes	17	4.3	27	6.7
No	75	18.8	184	45.8
No response	306	76.9	191	47.5
Had sex in return for drugs				
Yes	36	9.0	82	20.4
No	356	89.4	289	71.9
No response	4	1.5	31	7.7
Heard about HIV AIDS				
Yes	143	45.4	172	54.6
No	255	52.6	230	47.4
Can healthy looking persons have HIV				
Yes	63	15.8	53	13.3
No	44	11.0	68	16.9
Do not know	30	7.5	46	11.4
No response	261	65.5	235	58.4
HIV transmission through sharing of syringes				
Yes	235	59.0	165	41.0
No	39	9.7	43	10.6
Don't know	101	25.3	177	44.0
No response	23	5.7	17	4.2
Aware of site where HIV AIDS testing is performed				
Yes	13	3.3	82	20.4
No	117	29.4	75	18.7
Do not know	268	67.3	245	60.9
Are you in danger of having HIV				
Yes	19	4.8	62	15.4
No	77	19.3	39	9.7
Do not know	134	33.7	135	33.6
No response	168	42.2	166	41.3

Punjabi (11.8%) were the predominant ethnicities in Hyderabad. In Sukkur, Sindhi (67.2%), Punjabi (10.4%) and Urdu (9%) were the main ethnicities.

In Hyderabad majority of IDUs (41.5%) lived on mazar (mausoleum) followed by home 146 (36.7%) and street 65 (16.3%). In Sukkur home (66.2%), street 86 (21.4%) and mazar 40 (10%) were the main living arrangements.

Time as an IDU was divided in five years, 5-10 years and > 10 years (Table 1). Two to three injections in a day were predominant, as 62.8% respondents in Hyderabad and 78.1% in Sukkur reported using them for narcotic reasons.

Sharing of injection equipment for the last injection in Hyderabad was reported by (8.5%) IDUs whereas in Sukkur it was (33.6%). Occasional use of new syringe was stated by more than 50% IDUs in both cities. Last injection with a new syringe was used by (55.5%) IDUs in Hyderabad and (19.9%) in Sukkur.

Sexual activity with wife or a woman in the past month was had by (22.6%) IDUs and condom in the last sexual act was used by 17 (4.3%) respondents in Hyderabad. In Sukkur (50.7%) IDUs informed that they were involved in sexual activity whereas condoms were use by (6.7%) respondents (Table 2). Sexual activity in return for drugs was reported by 9% IDUs in Hyderabad and 20.4% in Sukkur.

More than half (54.6%) IDUs in Sukkur and slightly less (45.4%) in Hyderabad had heard about HIV and AIDS. Sharing of syringes and transmission risk of HIV was correctly identified by (59%) IDUs in Hyderabad and 50 (41%) in Sukkur. Perceived vulnerability of HIV was reported by 19 (23.5%) IDUs in Hyderabad and 62 (76.5%) in Sukkur.

In Hyderabad and Sukkur high risk behaviours such as injecting drugs for more than 10 years and injecting four or more times in a day were significantly associated with transmission of HIV infection (Table 3). Whereas not using a condom in the last sexual act and proper use of condom can provide protection in HIV transmission were noticeable.

Table 3: Comparison of high risk behaviors of HIV positive and negative IDUs in Hyderabad and Sukkur by test status.

Variable	HIV positive (N=178)	%	HIV negative (N=622)	%	P value
Injecting drugs for >10 years	53	29.8	0	0	0.00
Injecting 4 or more times in a day	39	21.9	104	16.7	0.11
Shared syringe and needle last time	44	24.7	125	20.1	0.18
Did not use a condom in the last sexual act	63	35.4	196	31.5	0.32
Proper use of condom can protect HIV infection	31	17.4	79	12.7	0.00

In Hyderabad the seroprevalence of HIV was 25.4% (101/398) and in Sukkur it was 19.2% (77/402).

Discussion

IDUs in Hyderabad (25.4%) and Sukkur (19.2%) have alarming prevalence of HIV infection. This is the first time HIV prevalence from these two cities of Sindh province has been documented. The average age of IDUs was less than 40 years indicating that they are young and loosing the prime of their life to drug addiction, not doing anything for their livelihood and since above 40% in both cities were married, they are exposing their spouses to risk as well. IDUs also indulge in sexual activity and the reported condom use was less than 10 They are therefore also acquiring a serious risk to themselves.

There is no organized programme providing harm

reduction services to IDUs in either city. In Hyderabad one non - government organization has established a center which provides some services. However it has been observed that the utilization was of this center was fairly low. In comparison there are no such services available in Sukkur which could be observed in the behaviours of the IDUs, as 2-3 injections in a day was higher (78.1%) when compared to Hyderabad (62.8%) or sharing a used syringe for last injection was 33.6% in Sukkur and 8.5% in Hyderabad. In Sukkur 20.4% IDUs reported having sex in return for drugs indicating the obvious likelihood of homosexual activity compared to nine percent for Hyderabad. Infection can and does occur with just one unprotected sexual encounter.

Harm Reduction refers to policies or programmes directed towards reducing the negative health, social and economic consequences of drug use to the individual user and to the wider community even though the drug user may continue to use drugs at this time.[17] Research indicates that participation in harm reduction programmes is associated with a lower incidence of HCV and HIV infection in ever-injecting drug users, indicating that combined prevention measures-but not the use of needle exchange programme or methadone alone-might contribute to the reduction of the spread of these infections.[18,19] At these programme services like needle exchange, primary health care including syndromic management of STIs, counseling, bathing and a place to relax are provided.

Sindh AIDS Control Programme with support of the World Bank established similar kinds of services for IDUs in Karachi and although services for other cities of Sindh including Hyderabad and Sukkur were also planned but they could not materialize due to bureaucratic delays.

There are certain limitations to our study. We could not perform logistic regression analysis to assess the correlates of infection. Certain variables in knowledge and behaviours for e.g. use of condom or self perception of acquiring HIV infection had a very high percentage of "no response" indicating that the interviewers did not do the best job of probing. However, the study participants were recruited from all major spots of the cities where they congregate and indulge in risky behaviours thus increasing the representation of the sample.

The current situation in Hyderabad and Sukkur require urgent measures to address this problem and development of organized harm reduction services as early as possible. Besides harm reduction there should also be rehabilitation services to reduce the addiction habit.

The study concluded that the prevalence of HIV in IDUs, a vulnerable group in two main cities of Sindh is extremely high and poses a serious risk of further spreading the epidemic among other vulnerable groups and bridging populations.

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