Prevalence of HIV, HBV & HCV and their co-infections among intravenous drug users at a harm reduction centre in Amritsar: A case control study.

Medical Science

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ABSTRACT

Background-Intravenous drug users represent a special subgroup of populations who are at an exaggerated risk of acquiring blood borne viral infections especially HIV, HBV & HCV. Also due to shared risk factors they are more prone to get co-infected with them worsening the clinical conditions and increasing case fatalities.

Material & Methods-The sera samples from 100 intravenous drug users attending Opioid substitution therapy centre and 100 healthy age matched controls were taken and tested for antibodies to HIV-1 & 2, HBsAg and anti-HCV antibodies using rapid assays.

Results-Overall seroprevalence rate for HIV was 20%, HBV 11% and HCV 42% .The co-infection rates for HIV+HBV, HIV+HCV, HBV+HCV and HIV+HBV+HCV was 4%,12%,4% and 1% respectively. High risk drug abuse behaviours were reported in 41%, prolonged duration of drug injection >1 year in 68% and multiple injections per day in 70% of the Intravenous drug users. Risky sexual practices like encounter with commercial sex workers and multiple sexual partners were reported in 34% of injectors.

Conclusion- A high population of intravenous drug users, common precursor risk factors and the ever growing menace of these three blood borne viral infections necessitates the need of understanding the dynamics of drug injecting population and also to estimate the burden of these infectious markers among them.

Introduction

Intravenous drug users represent a special subgroup of population who are at an increased risk of acquiring infections with blood borne viruses like HIV,HBV and HCV due to sharing of contaminated needles and syringes for drug injection besides their life style, risk behaviours and socioeconomic circumstances[1].Currently 1.86 lakh intravenous drug users reside in India and the estimated prevalence rate of HIV in this population has been reported to be 9.19%, which is alarmingly high and accounts for 1.6% of the total HIV infections in the country as per 2008-2009 sentinel surveillance data[2].Because of its proximity to Golden Crescent and illicit drug trafficking, Punjab tops the country when it comes to the transmission of HIV epidemic through IVDUs. According to data revealed by PSACS, as against national prevalence of HIV in IVDUs being 9.19%, in Punjab the percentage is 26.1% which is about thrice the national figure[3]. Amritsar district warrants special focus because this district has highest incidence of HIV positive persons in the state i.e 3.63%[4].Also according to NACO report Amritsar district has the highest number of HIV positive Intravenous Drug Users (30.4%) in the country and has now overshot Churchandpur district of Manipur (28%) in this regard[5,6].Inspite of the overlapping risk factors the prevalence of these blood borne viral infection not only vary among developed and developing countries, but a wide spectrum of results are also seen among various developing countries. Even within a country the pattern were not found to be uniform. So our present study aimed to give an assessment of prevalence of these blood borne viral infections in a highly concentrated and risk prone subset of intravenous drug users in a drug prone district of Amritsar.

Material and methods
Study design

This was a case control study conducted among 100 intravenous drug users recruited from opioid substitution therapy centre working under the Psychiatry department at Government Medical college, Amritsar. The duration of our study was between January 2013 to May 2014. 100 healthy age matched individuals were taken as control.

Only those IVDUs fulfilling the following criterias were selected as case subjects

1)Being of age ≥ 18 years 2) History of intravenous drug usage in last 3 months 3) No clinical manifestations of hepatitis 4) being able to provide informed consent.

Upon explaining our study design to the participants written informed consent was taken from all the participants about which was explained to them in vernacular language also. After obtaining consent the participants were interviewed and assessed using a structured questionnaire. Full confidentiality was maintained pertaining to the replies & result of the participants.

Viral Infection Assays

Upon completion of the interview subjects were asked to submit their venous blood samples. Sera was separated and stored at 2-8⁰ C until tested.HIV Infection was tested using strategy III of NACO guidelines i.e using 3 E/S/R tests for confirmation of HIV infection. Participants were tested using SD Bioline HIV1/2 test (SD Bio standard Diagnostics pvt ltd) as the screening assay. The serum found to be reactive in the screening assay was subjected to the supplementary confirmatory tests. These were Pareekshak HIV ½ Triline card test (Bhat Bio-tech India (P) ltd) and AISCAN HIV1/2 trispot test (Bhat Bio-tech India (P)ltd). The serum sample found to be reactive for anti HIV antibodies in all three tests was considered to be positive for HIV. HBV (HBsAg) was tested using a rapid immunochromatographic assay (CRYSTAL HBsAg Device, Span Diagnostics ltd) and anti HCV antibodies were tested by a cassette style one step rapid direct binding test based on double antigen sandwich immunoassay (SIGNAL HCV, Span Diagnostics ltd).

Data Analysis

The data obtained was compiled, tabulated and statistically analysed to obtain valid results and statistically to obtain valid results. Statistical testing was conducted with the statistical package for the social science system version SPSS 17.0. Categorical variables were presented as absolute numbers & percentage and were compared using Chi square test(x^2).   P < 0.05 was considered statistically significant.

Ethical statement

All participants provided written informed consent. The study protocol was approved by the Institution review board and Ethical review board of Government Medical College, Amritsar. Full confidentiality of the results was obtained and the data obtained was used for the sole purpose of research.

Results

A total of 100 IVDUs as cases and 100 normal healthy age matched individuals as controls participated in the study.

Characteristics of the study population.(Table 1)

The socio demographic characters of the case subjects in our study showed that maximum number of cases belonged to age group of 21-40 years (60%) with the mean age being 29.60±7.5 years. All 100(100%) of them were males. While 47% subjects were married, 50% were unmarried as against the 74% married and 26% unmarried subjects in controls. These differences were found to be statistically significant.(p<0.05) The study of literary status in the study subjects showed that while 30% of our cases were illiterate ,45% with education up till metric and only 25% with higher education. Almost similar results were obtained among the control subjects and no statistically significant differences were observed. Urban and rural residents among both case and control subjects were equal in number. Maximum number of our cases (52%) were daily wage labourers as against full time employed in the control subjects (50%) and a statistically significant difference was obtained (p<0.05).

Drug abuse and sexual behaviours of the study population (Table 2)

Of all the 100 case subjects 41% gave history of needle/syringe/paraphernalia sharing. Multiple drug injection was reported by 15% of subjects. Of the spectrum of drugs injected Heroin was the principal drug injected in 75% of the cases. 68% of the recruits had been injecting for more than one year with the median age at the time of first injection being 25.7years. Also multiple injections per day were reported in 70% of the case subjects.

High risk sexual practices (encounter with commercial sex workers and multiple sexual partners) were reported in 34% of the recruits. This was found to have a statistical association among IVDUs (p<0.05).A high condom usage rates were observed among both the cases and controls and no statistically significant association was reported.

Seroprevalence rates (Table 3)

The overall seroprevalence for HIV, HBV and HCV in the cases was 20%, 11% and 42% respectively. Among control participants the seroprevalence rates for HIV, HBV and HCV were 0%,2% and 1% respectively. All these differences were found to be statistically significant. (p< 0.05). Mono-infection rates for HIV, HBV and HCV were found to be 3%, 2% and 25% cases respectively. The co-infection rates in case subjects for HIV+HBV, HIV+HCV and HBV+HCV were reported as 4%, 12% and 4% respectively. HIV+HBV+HCV infection was reported in 1%. In the control subjects no co-infected cases were reported.

Discussion

Injection drug use in India has been known to be prevalent since 1980's.Initially concentrated in the north-eastern states,

the menace of intravenous drug usage ha now spread to all the geographical corners of India. Drug trading routes have evolved over the time from "Golden Triangle" predominant route to the trading through "Golden Crescent". This shift exposed new population groups and areas to this ever growing menace.

Simulating the growing trend of Intravenous drug usage, a parallel rise in the incidence of HIV infection was seen among the injecting drug population over this period.

This highly volatile group of Intravenous drug users play a key role in the continuing epidemic of HIV and other blood borne viral infections. The crux of this intertwined epidemic lies in their lifestyle of which the primary implicating factors are drug abuse behaviour and high risk sexual practices. Through both type of risk behaviours intravenous drug users are an important factor in continuing the evolution of these epidemics.

The priority goal of our study was to estimate the seroprevalence of HIV, HBV, HCV and their co-infections among intravenous drug users as against a control sample of 100 healthy age matched controls.

A large number of studies both in the developed and developing countries have been undertaken among intravenous drug users to estimate the prevalence of the above mentioned blood borne viral infections. Our study of literature revealed that a wide spectrum of results for the seroprevalence rates these infections have been observed. The seroprevalence rates for HIV ranged from as low as 0.6% to as high as 47.3%[7,1]. The reported seroprevalence rates for HBV & HCV infections also depicted wide spectrum of results. For HBV it was seen that seroprevalence rates ranged from 0.7%-70.4%[8,9] and for HCV they were 10.5%-96%[10,11]. Even within a defined geographical boundary the seroprevalence rates were not uniform.

Seroprevalence rate for HIV in our study was reported as 20%. Our results were in concordance with studies conducted in Amritsar (16.6%) and Mumbai(20.8%)[12,13]. The seroprevalence rate in our study is double the national figure for HIV seroprevalence among intravenous drug users(9.19%)[2] while seroprevalence rate was lower than that reported from Chennai(30%) & Delhi(36.99%),[14,15] it was higher than the prevalence rate from Assam(10.8%)& Kolkata(1.46%)[16,17].

These findings give a strong indication that though northeastern areas of India were traditionally the epicentres of the HIV spread through IVDUs, newer pockets of high risk group of IVDUs with high seroprevalence rate for HIV infections have emerged with ig metropolitan cities being at the focal point.

IVDUs were also significantly associated with HBV & HCV infection,(p<0.05). The seroprevalence rate for HBV of 11% in our study was in concordance to a previous study conducted in Amritsar (15.25%)[18]. In contrast a very low seroprevalence rate was reported from Assam (3.8%)[16] and a higher from Delhi(39.59%)[15].

Seroprevalence rate for HCV in our study was found to be 42%. Similar results were also reported from Assam (47.8%) & Kolkata (42.2%) [16,17] seroprevalence rate for HCV was reported on the higher side of spectrum in Mumbai (76.8%)[13]

All these three blood borne viral infections had a statistically significant association in IVDUs. This primarily reflects that intravenous drug usage is a significant factor in the spread of these blood borne viral infections. Out of all the 3 viral infections highest seroprevalene was recorded for HCV. Also a p value of <0.001 suggests that though all the above mentioned viral infections are transmitted by parenteral route, this route was the primary

route for the spread of HCV.

Various co-infections among these viral infections are very common due to shared common risk factors. In our study the highest seroprevalence rate among co-infections was reported for HIV+HCV (12%) and our results were corroborated by a study conducted in Yunnan province of China with HIV+HCV co-infection rate of 15.5%[19]. HIV+HCV co-infection among IVDUs has fatal outcomes as this co-infection is known not only to reduce spontaneous clearance of HCV but also increases the viral load of HCV which leads to severe presentation, faster progression to liver failure[20].Though these three viral infection share common risk factors the varying seroprevalence rates also underlines the importance of circulating viral pool in the local settings.

Our study has several limitations. Our study samples were from a harm reduction centre which could mean that these results may not be generalised to other IVDU population. All the risk factors relating to drug usage and sexual behaviours were self reported by the patients which could have led to recall bias regarding them. Also when answering questions about sensitive behaviours, participants may have given what they perceived to be socially desirable response.

The strength of our study was that stringent criteria were applied for case selection. Only IVDUs who were regular clients at OST centre with diagnosis established by consultant from Psychiatric Department were enrolled in the study.Our study was conducted in a highly drug prone area of a developing country and this would in turn provide an insight on the current trend of prevalence of these blood borne viral infections among Intravenous drug users.

Conclusion

From our study we can conclude that Intravenous Drug use is prevalent in all the regions of the country. There is also a high prevalence of HIV, HBV, HCV infection and co-infection among them. The current harm reduction strategies being programmed by the government have been ineffective in putting a curb to the spread of these infections among IVDUs and they continue to being a priority target group in the health programmes. High rate of injection drug usage coupled with high risk sexual behaviours have resulted in the concentration of these infections in IVDUs. Since co-infections can lead to more aggressive liver diseases early screening & treatment of all IVDUs for HBV & HCV together with HIV is recommended. Provision of disposable needle/syringes, condoms and hepatitis B vaccination should be made available and acceptable option to combat the growing menace of these blood borne viral pathogens. A focused investigation and counselling of their sexual partners should also be undertaken to prevent the spread of these viral infections among non-injecting sexual partners and thus reducing the chances of IVDUs to act as bridge population. overall a comprehensive prevention approach addressing risky injection practices with risky sexual behaviours that is tailored to the needs of different IVDU populations is needed. Furthermore stigma and discrimination against them needs to be counteracted for them to have an access to diagnosis &treatment.

TABLE -1 SOCIO DEMOGRAPHIC PARAMETERS AMONG IVDUs

Parameter	variables	Control (n=100)	%	Cases (n=100)	%	p-value
	< 20 yrs	5	5%	4	4%	
	21 - 40 yrs	72	72%	87	87%	
	41 - 60 yrs	21	21%	27	27%	
AGE	>60 years	2	2%	1	1%	
MEAN AGE		35.04 ± 10.94		29.60 ± 7.54		<0.001
GENDER	Male	100	100%	100	100%	
	Female	0	0%	0	0%	
MARITAL STATUS	Married	74	74%	47	47%	0.001
	Unmarried	26	26%	50	50%	0.0005
	Divorced	0	0%	3	3%	0.810
LITERARY STATUS	Illiterate	25	25%	30	30%	
	Upto matric	42	42%	45	45%	
	Matric and above	33	33%	25	25%	0.556
GEOGRAPHICAL DISTRIBUTION	Rural	54	54%	51	51%	
	Urban	46	46%	49	49%	0.671
OCUPATION	Daily Wager	36	36%	52	52%	0.004
	Full Time Employed	50	50%	27	27%	0.0008
	Retired	3	3%	1	1%	0.621
	Unemployed	11	11%	20	20%	0.079

TABLE 2 DRUG ABUSE AND SEXUAL BEHAVIOURS AMONG IVDUs

parameter	variables	Control (n=100)	%	Cases (n=100)	%	p – value
NEEDLE/SYRINGE/ PARAPHERNALIA SHARING	No	-	-	59	59%	-
	Yes	-	-	41	41%	-
NUMBER OF DRUGS INJECTED	Single Drug Injected	-	-	85	85%	-
	Multiple Drugs Injected	-	-	15	15%	-
TYPE OF DRUG INJECTED	Heroin only	-	-	75	75%	-
	Buprenorphine only	-	-	7	7%	-
	Benzodiazepines only	-	-	3	3%	-
	Buprenorphine + Benzodiazepines	-	-	15	15%	-
DURATION SINCE FIRST ENCOUNTER (YEARS)	< 1 yr	-	-	32	32%	-
	1-5 yrs	-	-	37	37%	-
	6 - 10 yrs	-	-	17	17%	-
	≥10 yrs	-	-	14	14%	-

FREQUENCY OF INTRAVENOUS DRUG USAGE/ DAY	< 1	-	-	30	30%	-
	1 - 3	-	-	61	61%	-
	>3	-	-	9	9%	-
SEXUAL PRACTICES	Commercial sex worker	7	7%	21	21%	<0.004
	Multiple Sex Partners	4	4%	13	13%	0.023
	Single Sex Partner	70	70%	48	48%	0.001
	No Sexual History	19	19%	18	18%	0.856
CONDOM USAGE	No	22	22%	22	22%	
	Yes	59	59%	60	60%	0.982
	No Sexual History	19	19%	18	18%	

TABLE 3 SEROPREVALENCE OF HIV, HBV & HCV AMONG IVDUs

parameter	control	%	cases	%	P – Value
HIV (overall)	0	0%	20	20%	<0.001
HBV(overall)	2	2%	11	11%	0.018
HCV(overall)	1	1%	42	42%	<0.001
HIV only	0	0%	3	3%	
HBV only	2	2%	2	2%	
HCV only	1	1%	25	25%	
HIV +HBV	0	0%	4	4%	<0.001
HIV+HCV	0	0%	12	12%	
HBV +HCV	0	0%	4	4%	
HIV+HBV+HCV	0	0%	1	1%	

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