

Prevalence of & knowledge, attitude & practices towards HIV & sexually transmitted infections (STIs) among female sex workers (FSWs) in Andhra Pradesh

R. Hemalatha, R. Hari Kumar, K. Venkaiah, K. Srinivasan* & G.N.V. Brahmam

*National Institute of Nutrition (ICMR), Hyderabad & *Family Health International, New Delhi, India*

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Background & objectives: As part of the baseline survey carried out during 2005-06, biological and behavioural data were generated on about 3200 female sex workers (FSWs), from eight districts of Andhra Pradesh (AP), India. This study describes the relationship between socio-demographic and behavioural factors with consistent condom use (CCU) and HIV among FSWs in AP.

Methods: A cross-sectional community-based study was conducted among female sex workers (FSW) in eight districts of Andhra Pradesh, India, using conventional cluster sampling and time-location cluster sampling. Key risk behaviours and STIs related to the spread of HIV were assessed. Blood samples were collected to detect syphilis, Herpes simplex virus type 2 (HSV-2) *Chlamydia trachomatis* (CT), *Neisseria gonorrhoeae* (NG) and HIV serology.

Results: About 70 per cent of the FSWs were illiterates, nearly 50 per cent were currently married and 41 per cent of the FSWs had sex work as the sole source of income. More than 95 per cent of the FSWs heard of HIV, but about 99 per cent believed that HIV/AIDS cannot be prevented. Logistic regression analysis showed significantly lesser CCU with high client volume, not carrying condom and could not use condom in past 1 month due to various reasons such as non co-operation by the clients. Similarly, CCU was significantly ($P<0.001$) lesser (only 8.9%) with regular non-commercial partners. Overall there was 16.3 per cent prevalence of HIV amongst FSWs. *C. trachomatis* and *N. gonorrhoeae* were prevalent in 3.4 and 2 per cent of the FSWs, respectively and about 70 per cent of the FSWs were positive for HSV2 serology. HIV was significantly associated with STIs.

Interpretation & conclusions: Misconception that HIV/AIDS cannot be prevented is very high. Most of the subjects in the present study had first sexual debut at a very young age. HIV was associated with STIs, emphasizing aggressive STI diagnosis and treatment. CCU must be emphasized right from first sexual debut with all clients and non-commercial partners as well.

Key words Condom - FSW - HIV - knowledge - STI

The prevalence of HIV infection in India has been steadily increasing over the past few decades^{1,2}. Commercial sex workers and their clients are at highest risk for HIV infection and transmission^{2,3}. Certain States in India viz. Andhra Pradesh, Tamil Nadu, Maharashtra,

Karnataka, Nagaland and Manipur have been reported to have high number of HIV infected population in India¹. According to the data available from National Family Health Survey, 2006⁴, 2.5 million people in India are infected with HIV.

India AIDS initiative, a large scale HIV prevention intervention programme, supported by Bill & Melinda Gates Foundation, has been under implementation in six high prevalence States of India, since 2003. This HIV prevention programme targets FSWs, men who have sex with men (MSM), clients of sex workers and injection drug users in 83 districts of the six high prevalence States and the national highways in India. Andhra Pradesh is one of these, with eight of its districts highly populated with high risk groups¹. The strategies employed to address HIV prevention among sex workers and their clients include promotion of safer sex behaviour, with particular focus on promotion of condom use; enhancing the enabling environment for the adoption of safer sex practices, with distribution and social marketing of condoms; and enhanced sexually transmitted infection management. District level cross-sectional surveys assessing behavioural and biological endpoints are an integral part of the programme strategies. During 2005-2006, biological data (human immuno deficiency virus, *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, syphilis and Herpes Simplex virus type 2) and behavioural data (knowledge, attitude and practices towards HIV and STIs) were collected on about 3200 FSWs, from eight districts of AP. The present study describes the perceptions of risk related to HIV and STIs, and also explore the relationships of knowledge, attitude and practices with HIV and consistent condom use (CCU) among FSWs in Andhra Pradesh.

Material & Methods

The study was conducted during December 2005 to October 2006. For all the districts (Guntur, E. Godavari, Visakhapatnam, Prakasham, Chittoor, Warangal, Karimnagar and Hyderabad), a two-stage cluster sampling design was adopted. The Scientific Advisory Committees and Institutional Ethics Committee approved the study. The districts were chosen based on two key-criteria: socio-cultural regions and size of the FSW population. The locations where FSWs frequented were identified by mapping entire districts. Brothel-based or non-brothel based such as public places like parks, streets, cinema halls, bus stands, railway stations, *etc.* where FSWs solicit clients were considered. Written consent was obtained from all the subjects (FSWs) before collecting data and biological samples. Care was taken to maintain confidentiality of the study subjects.

The sample size of 400 per district was arrived at based on key risk behaviour of condom use, with an

estimated absolute difference of 15 per cent or more from the assumed value of 50 per cent with 95 per cent confidence interval. Details of the study design have been described elsewhere⁵. Key risk behaviours and STIs related to the spread of HIV were assessed. For the behavioural assessment, face-to-face interviews using structured questionnaires were used. The questionnaire covered number and types of sexual partners, condom use with different types of partners, knowledge of STIs and STI care-seeking behaviours, knowledge and attitudes toward HIV/AIDS, and perception of HIV and STI risk was assessed based on questions such as ever heard of HIV, misconceptions about HIV, ever undergone HIV testing, feel at risk of being infected. STI knowledge was assessed based on the ability of the FSW to correctly identify at least three of the six most common symptoms, *viz.*, lower abdominal pain, foul smelling vaginal discharge, burning on micturition, genital ulcer/sore, swelling in the groin area, and genital itching. Mobility and migration patterns influencing perception of HIV and STI risk was also assessed. Consistent condom use (CCU) was defined as condom use with every sexual contact. This was assessed separately for clients, and nonpaying partners.

Blood samples (8-10 ml) were collected to detect syphilis, Herpes simplex virus type 2 (HSV-2) and HIV serology. Seroprevalence of HIV infection was determined by using two test algorithms (Screening test- Microlisa - HIV by J. Mitra and Confirmatory test- Genedia HIV 1/2 ELISA 3.0 by Greencross life Sciences Corp, Korea). HSV-2 ELISA was performed on 10 per cent of randomly selected samples using HerpSelect 2 ELISA IgG kits (Focus Diagnostics, USA). Syphilis was diagnosed based on rapid plasma reagin (RPR) titre, followed by TPHA confirmation. *N. gonorrhoeae* (NG) and *C. trachomatis* (CT) were detected in urine samples by Gen-Probe APTIMA Combo 2 assay (USA).

Statistical analysis: Descriptive statistics was carried out to study the profile of the female sex workers. Logistic regression analysis was done with Statistical Package for Social Sciences version 15 (USA) using the complex sampling module. All estimates were weighted for unequal selection probability. The complex sampling module was used to account for the weights for unequal selection probability.

Results

A total of 5580 FSWs were approached, of whom 3223 FSWs gave written consent to participate in the

Table I. Demographic and behavioural profile of female sex workers (FSWs)

Parameter	Percentage	P value
Typology		
Home	26.0	<0.001
Brothel	18.3	
Public places	55.8	
Current age (yr)		
< 20	3.2	<0.001
20-24	18.3	
25-29	26.3	
30-34	21.5	
35-39	20.6	
40-44	7.7	
45+	2.4	
Educational status		
Illiterate	71.6	<0.001
1-5 standard	13.6	
6-10 standard	14.4	
11 standard or more	0.5	
No source of income other than sex work	41.0	
Current marital status		
Never married	8.2	<0.001
Currently married	49.0	
Separated/Widowed/Divorced/Deserted	42.8	
Age at starting sexual (yr)		
<18	76.2	<0.001
18-24	23.2	
25 +	0.5	
<i>Mean age at first sex</i>	15.7	
<i>Mean age at sex work debut (yr)</i>	23.6	
<i>Mean duration in sex work (yr)</i>	6.2	
Client volume per week		
< 5	27.5	
5-9	37.8	
10+	34.7	
<i>Mean no. of clients per week</i>	8.6	
<i>Mean no. of clients per day</i>	2.4	
Have occasional client		
Condom use with occasional client in last sex	91.1	
Consistent condom use with occasional client	70.8	
Have regular client		
Condom use with regular client in last sex	84.9	
Consistent condom use with regular client	62.8	

Parameter	Percentage	P value
Have non-paying main regular partners	77.9	
Condom use with non-paying main regular partner in last sex	8.9	
Have other non-paying partners	23.6	
Condom use with other non-paying partner in last sex	54.9	
Wanted to use condom but could not in past month	28.7	
Aware of at least two STIs signs/symptoms among women	88.9	
Ever heard of HIV/AIDS	97.3	
Aware that HIV/AIDS can be prevented	1.3	
Ever contacted by peer/outreach worker	75.9	

survey and completed the behavioural interview and gave biological (blood and urine) samples. The mean (SD) age of the FSWs was 30.5 ± 7.38 yr, ranging from less than 20 to more than 45 yr, but a majority ($P<0.001$) of them were 20-40 yr old (Table I). Significantly ($P<0.001$) higher number of FSWs were illiterates and solicited clients on bus stops or streets (public places). Very few FSWs were never married ($P<0.001$), with more than 90 per cent being either currently married or widowed or separated and 41 per cent of the FSW had sex work as the sole source of income (Table I). Majority (76.2%) of the FSWs had first sexual debut at very young age (<18 yr), with mean age at first sexual debut being 15.7 yr; though the mean age they began sex work was 23.6 yr. Mean duration in sex work was 6 yr (Table I).

Three thousand one hundred (96.2%) of the FSWs had regular clients and a similar proportion (93.8%) also had occasional client with mean clients being 2.4 per day. 2514 (78%) had nonpaying regular partners apart from clients. Condom use in last sex was 91 per cent (2933) and 84.7 per cent (2723) with occasional and regular clients, respectively, as against only 8.9 per cent (28) with nonpaying regular partners. Consistent condom use (CCU) was slightly lesser with regular clients compared to occasional clients and nearly a quarter (28.7%) of the FSWs could not use condom though they desired (Table I).

Nearly 90 per cent of the FSWs had heard of STIs and could correctly identify at least two of the most common STI symptoms. A high proportion of FSWs (52 to 89%) reported that they had at least one of the three STI symptoms (vaginal discharge, lower

abdominal pain or ulcer) at least once during the last year. Two to 12 per cent of the FSWs reported genital ulcer/sore at the time of the survey. More than 75 per cent of the FSWs opted for trained care (Avahan, other NGO, Government or private doctors/clinics) for the treatment of STIs.

More than 95 per cent (3061) of the FSWs heard of HIV, but about 99 per cent believed that HIV/AIDS cannot be prevented (Table I); 18 to 77 per cent of the FSWs reported having ever undergone a HIV test among the different districts covered. More than 35 per cent (1200) felt that they were 'at-risk' for HIV infection.

C. trachomatis and *N. gonorrhoeae* was prevalent in 110 (3.4%) and 64 of 3223 (2%) of the FSWs respectively and about 70 per cent of the FSWs were positive for HSV2. HIV was prevalent in 16.3 per cent (525) of the FSWs. All the STIs (syphilis, *N. gonorrhoeae*, *C. trachomatis* and HSV2) were significantly ($P<0.01$) associated with HIV infection in the population studied.

Of the 525 HIV positives FSWs, 236 (45%) were aged between 25 to 34 yr and an estimated 31.2 per cent were more than 35, while 23.5 per cent were less than 25 yr. 227 (43.0%) HIV positives had been in sex work for less than 5 yr and about 57 per cent (301) had been in sex work for more than 5 yr. 242 (46%) HIV positives FSWs solicited clients at public places and 29.7 and 21.6 per cent solicited clients from home or brothel, respectively. On assessing the STI status it was found that 21.6 per cent of the HIV positives were also positive for STIs as against only 11.8 per cent amongst HIV negative FSWs.

Logistic regression analysis showed that marital status, migration, typology (brothel or street based sex work), age or educational status had no influence on consistent condom use (CCU). However, high client volume (5-9 and more than 10 per week) had significantly ($P=0.03$) higher risk of not practicing CCU. Similarly, not carrying condom at the time of survey was significantly ($P=0.001$) associated with 2 fold (OR 1.911) increased risk of not practicing CCU (Table II). Amongst FSWs who were forced for sex, CCU was 1.6 fold lesser when compared to those who were not forced (OR 0.569). FSWs who wanted to use condom but could not use in past 1 month due to various reasons such as non co-operation by the clients showed four-fold decreased ($P<0.001$; OR 0.222) CCU when compared to those who did not face such

a situation (Table II). As for knowledge of HIV/AIDS prevention measures was concerned, FSWs without correct knowledge had CCU 2.7 fold lesser than those who had correct knowledge, though not significant. The other risk variables were not associated with CCU.

When logistic regression analysis was carried out to assess the risk of HIV with demographic and other variables (age, marital status, typology of sex work, educational status, CCU and STIs); none of the variables were associated with HIV except STIs, which was significantly ($P<0.05$) associated with HIV status.

Discussion

The HIV prevalence in India is estimated to be less than 0.5 per cent in adults, but higher HIV prevalence is reported in six States in India particularly in population with high risk behaviour, such as FSW, MSM and clients, where the majority of infections are acquired sexually^{2,3}. Andhra Pradesh is one of the high prevalence States in India with an estimated 16 per cent prevalence in FSWs, ranging from 8-41 per cent^{6,7}. The present study also reported a similar prevalence of HIV.

Most FSWs in the present study had their first sexual debut at a very young age and started sex work at about 5-6 years later. Similar observations were made in a survey carried out in 2006⁸. Adolescent and young adult behaviour is of special interest since the number of life-years saved would be greatest if HIV is prevented in young individuals; moreover, it may be easier to change sexual attitudes, practices and risky behaviours among the younger than the older population. Thus, young girls in their early teens have to be targeted by the HIV prevention programmes. Though, awareness about HIV/AIDS or STI was high, more than 90 per cent believed that HIV/AIDS cannot be prevented. Roughly two thirds of the FSWs population was illiterate, similar to that reported in an earlier study; however, a huge number of FSWs were street based in our study as against only 5 per cent in the earlier study⁸.

The extent of condom use at 'last sex' reported in the present study was similar to an earlier report⁶. We found no difference in CCU amongst married and never-married, widowed or separated FSWs, which is in contrast to an earlier report that showed a lower condom use in married⁹. CCU was low with non commercial partners. With HIV prevalence

Table II. Logistic regression analysis to assess potential risk variables that influence the consistent condom use (CCU)

Variable	Reference category	OR	95% C I		P value
			Lower	Upper	
Marital status					
Ever married but currently not living with husband	Ever married and living with husband	0.889	0.605	1.306	0.244
Never married but cohabiting		0.315	0.138	0.716	
Never married not cohabiting		0.565	0.114	2.790	
Devedasi/others		4.924	0.606	39.983	
No answer		0.180	0.008	4.292	
Locality status Non locality	locality	1.005	0.483	2.094	0.737
Migrated for sex work	yes	1.101	0.745	1.627	0.910
Typology					
Brothel/lodge	Home	0.587	0.312	1.104	0.227
Street		0.937	0.607	1.561	
Current age (yr)					
20-24	<20	1.093	0.492	2.432	0.864
25-29		1.059	0.461	2.431	
30-34		1.659	0.706	3.900	
35-39		1.474	0.617	3.522	
40-44		1.385	0.523	3.668	
45+		2.024	0.415	0.9873	
Educational status					
1-5 standard	iliterate	1.022	0.619	1.687	0.237
6-10 standard		1.192	0.774	1.838	
11 standard		0.362	0.100	1.316	
Source of income other than sex work	No	0.829	0.558	1.231	0.575
Client volume per week					
5-9 per week	< 5	1.585	0.822	3.059	0.03
10 + per week		1.747	1.037	2.941	
Duration in sex work (yr)					
2-4	<2	0.807	0.807	0.807	0.48
5-9		0.623	0.623	0.623	
10 +		0.705	0.705	0.705	
Reported forced sex by anybody in past 1 year	no	0.569	0.363	0.891	0.061
Currently carrying condom	no	1.911	1.133	3.222	0.001
Reported condom breakage in past 1 month	no	1.055	7.27	1.531	0.762
Wanted to use condom but could not in past 1 month	no	0.222	0.144	0.343	<0.001
Knows at least two STIs among women	no	2.279	0.860	0.6.040	0.44
Knows at least two STIs symptoms among men	no	1.062	0.616	1.831	0.75
Have correct knowledge of HIV/AIDS prevention	no	2.748	1.636	4.614	0.31
Ever taken HIV test	no	1.237	0.823	1.860	0.25

being high among FSWs, it is important to promote condom use in all types of sexual relationships, including regular, occasional partners and non commercial partners, since even non commercial partners might have risky sexual behaviours such as unprotected sex with multiple partners. One of the principle reasons for lower condom use amongst non commercial partners could be that it may signal mistrust. A cochrane review indicates that consistent condom use results in 80 per cent reduction in HIV incidence¹⁰. Addressing these issues in information, education and communication campaigns, including

encouraging HIV testing for regular non commercial partners assumes importance.

Educational messages should aim at enabling individuals to correctly assess their own HIV risk and also encourage behaviour change based on self-assessment of risk. It is also important to encourage condom use in all types of sexual relationships, including regular non commercial partners.

Many HIV positive FSWs were also positive for one or more sexually transmitted infections. As per an earlier study¹¹ women positive for STIs usually

have a high plasma viral load high enough to pose a risk of HIV transmission^{11,12}. It has been shown that the presence of STI increases shedding of HIV and that STI treatment reduces HIV shedding^{12,13}. In the present study, a high proportion of FSWs were positive for both HIV and STI suggesting a high risk of HIV transmission in the community.

The prevalence of HIV infection among FSWs is increasing in several districts of Andhra Pradesh and the HIV-infected FSWs remain sexually active after their HIV diagnosis. Correct knowledge about HIV spread was very low, misconception was very high. NACO envisages targeted interventions among the high-risk populations that include behaviour change, health care, treatment of sexually-transmitted diseases, provision of condoms, and creating an enabling environment for behaviour change to reduce HIV/AIDS incidence¹. In 2008 alone, there were 2.7 million new HIV infections¹⁴. One sixth of these new infections were among people less than 15 yr old¹⁴. Most FSWs in the present study had first sexual debut at a very young age. Keeping this in view, attempts are needed to educate young girls in their early teens about HIV prevention programmes and those that empower women.

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Reprint requests: Dr R. Hemalatha, Scientist "E", National Institute of Nutrition (ICMR), Jamai Osmania (PO), Hyderabad 500 604, India
e-mail: rhemalathanin@yahoo.com