ORIGINAL RESEARCH PAPER

Volume-8 | Issue-2 | February-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

SEROPREVALENCE OF HEPATITIS C INFECTIONS IN BROTHEL BASED FEMALE SEX WORKERS AND THEIR CO-INFECTION WITH HUMAN IMMUNODEFICIENCY VIRUS IN CENTRAL INDIA

Microbiology

Dr. Monu Singh* (MD. Microbiology), Indira Gandhi Govt. Medical college, Nagpur, 440001, India. *Corresponding Author

Dr. Rajani P. Tore Associate Professor, Department of Microbiology, Indira Gandhi Govt. Medical college, Nagpur, 440001, India.

Dr. Sharmila S. Raut Professor and head of department of Microbiology, Indira Gandhi Govt. Medical college, Nagpur, 440001, India.

ABSTRACT

BACKGROUND: It is estimated that about 1.1% of the adult women in India are engaged in sex work. FSW are potential risk group. Hepatitis C virus (HCV) and Human immunodeficiency virus (HIV) have shared routes of transmission so a frequent occurrence of HIV-Hepatitis co-infections in seems likely.

METHOD: Study was carried out from August 2014 to July 2016. 500 Sera samples were tested for HCV and HIV antibodies, out of which 250 sample were of brothel FSWs and 250 samples of were healthy female blood donors.

RESULTS: Seropositivity of HCV infection was found to be 1.20% and 0.40% respectively. HIV infection is 0.80% for both groups individually. While none of FSWs and female blood donor were coinfected with both the infections.

CONCLUSIONS: Low prevalence among study area suggests that Targeted intervention among this risk group is effective measure in decreasing the HCV and HIV co-infection rate.

KEYWORDS

Brothel, HCV, HIV

INTRODUCTION

Female sex worker (FSW) is an adult woman, engages in consensual sex for money or payment in kind, as her principle means of livelihood.[1] They can be categorised as - brothel and non-brothel-based sex workers. It is estimated that about 1.1% of the adult women in India are engaged in sex work.[2]

History of multiple sex partners, irregular condom use by the clients, and co-infection with other sexually transmitted infection (STI) constitute the potential risk factors associated with the HIV infection in FSW.[3] Hepatitis C virus (HCV), belong to genus *Hepacivirus* in Flaviviridae family. Hepatitis C virus is predominantly a blood-borne virus.[4,5] Human immunodeficiency virus (HIV)belongs to the family of human retroviruses (Retroviridae) and the subfamily of lentiviruses.[6] Due to shared routes of transmission, a frequent occurrence of HIV-Hepatitis co-infections seems likely.[7]

Sexual transmission of HCV has been studied extensively, but heterosexual transmission is rare and estimated to be only one per 190,000 heterosexual contacts. FSWs are at increased risk for HCV infection by the sexual route.[8] Infection with HIV has been also been reported to exacerbate several steps in the natural history of HCV, HIV infection has been associated with higher HCV RNA (ribonucleic acid) viral over load and rapid progression of HCV related liver diseases.[9]

At present, information about prevalence rate of HCV infection and their HIV co-infection among brothel FSWs in India as well as worldwide is quite limited. Hence this study was conducted to determine the prevalence of these infections in brothel based FSW population.

MATERIAL & METHODS

The present observational study was carried out in department of Microbiology, at a tertiary care hospital Indira Gandhi Govt. Medical College, Nagpur, India from August 2014 to July 2016. Sample were collected from FSWs referred from ICTC (Integrated Counselling and Testing Centre) and mobile ICTC, simultaneously healthy female blood donors were also screened. Total of 500 samples of age group 18-45 years were tested, out of which 250 sample were of FSWs and 250 samples of were healthy female blood donors.

Their sera were tested for

- HCV antibodies by ELISA (Hepatitis C Erba Lisa Test kit)
- HIV antibodies were tested as per the strategy III of the NACO Guidelines. [10]

RESULTS

Total of 250 serum samples of each female sex workers and female blood donors were screened for HCV antibodies and HIV antibodies. 03 FSWs and 01 female blood donor were positive for HCV infection. Seroprevalence of HCV infection was found to be 1.20% and 0.40% respectively (Table 1)

Table 1: Positivity of Hepatitis C among FSWs and female blood donor.

Hepatitis C infection	Brothel FSWs (%)	Female blood donors (%)	Total
Positive	03 (1.20)	01 (0.40)	04
Negative	247 (98.80)	249 (99.60)	496
Total	n=250	n=250	n=500

Among the brothel based FSWs maximum HCV positivity rate of 2.78% were in age group of 18-24 years followed by 1.35% among 35-45 years and least positivity rate of 0.71% were in age group of 25-34 years. (Table 2)

Table 2: Age wise prevalence of brothel based FSWs (n=250) for HCV infection.

Age group (in years)	Brothel based FSWs n=250		Total n=250
	HCV Positive (%)	HCV Negative (%)	
18-24	1(2.78)	35(97.22)	36(14.40)
25-34	1(0.71)	139(99.28)	140(56)
35-45	1(1.35)	73(98.65)	74(29.60)
Total	03(1.20)	247	250(100)

Among 250 FSWs, 03 (1.20%) were HCV positive while 02(0.80%) were HIV positive, but none of them was co-infected with HCV and HIV. (Table 3)

Table 3: HCV and HIV co-infection among FSWs (n=250).

	HIV Positive	HIV Negative	Total
HCV infection Positive	00	03	03
HCV infection Negative	02	245	247
Total	02	248	500

Similarly, among 250 Female blood donor none were HCV positive

while 02 (0.80%) was HIV positive hence none of them were co-infected. (Table 4)

Table 4: HCV and HIV co-infection among female blood donors (n=250).

	HIV Positive	HIV Negative	Total
HCV infection Positive	00	00	00
HCV infection Negative	02	248	250
Total	02	248	250

DISCUSSION

In the present study, total of 250 serum samples of FSW were tested for HCV and HIV infection. Simultaneously 250 serum sample of female blood donors were compared as a control group.

Seroprevalence of Hepatitis C among FSWs and female blood donor

Percutaneous exposure to HCV, such as through blood transfusion, intravenous drug use, and surgery is a well-established risk factor for HCV infection, but the causal relationship between sexual contact and HCV infection has not been extensively studied.[11] Reports of prevalence and risk factor of HCV among female commercial sex workers are very few, FSWs are sexually promiscuous therefore vulnerable to various STI including HCV infection.[12]

In the present study the prevalence rate of HCV infection was observed to be 1.20% while of female blood donor was 0.40%. On statistical comparison of FSWs and female blood donors, there is significant difference in HCV positivity rate among the two groups indicating higher prevalence of HCV infection among FSWs. Limited data is available for the prevalence of HCV infection among FSWs and female blood donors. Study done by Sandesh K *et al* (2006)[13] had observed seroprevalance of 2.6% among FSWs while that of voluntary blood donors was 0.33%. There was significant difference between the two group in the study. Desai PS et al (2013)[3] studied prevalence of 2.8% brothel based FSWs.

Age wise prevalence of brothel based FSWs for HCV infection

In the present study, FSW positivity rate for HCV infection showed maximum positivity of 2.78% (01/36) among 18-24 years followed by 1.35% (01/74) in age group of 35-45 years, least were in age group of 25-34 years with 0.70% (01/74)

As limited studies were available for HCV infection among the FSWs, none of the studies had compared the positivity rate among the different age groups of brothel based FSWs. Higher rate of HCV infection among age group of 18-24 year compare to other age group in FSW indicate decrease awareness of the disease in younger age.

HCV and HIV co-infection among FSWs

The frequency of HCV transmission to sexual partners is five times higher when HIV is also transmitted, suggesting that HIV may be a co-factor for the sexual transmission of HCV.[12]

In the present study among 250 FSWs seroprevalence of 1.20% were observed for HCV infection and 0.40% for HIV infection but none of them were co-infected. Similarly, Kweon SS *et al* (2006)[11] also observed no co-infection among the FSWs. In contrast co-infection rate of 1.2% was observed by Desai PS *et al* (2013)[3], 2.04% by Trevisol FS *et al* (2013)[14], 13.4% by Barua P *et al* (2012)[12].

HCV and HIV co-infection among female blood donors

In the present study on comparing with 250 female blood donors for HCV and HIV infection, none were HCV positive while 02 (0.6%) were HIV positive hence none of the female blood donors were co-infected.

The nature of their work makes sex workers more vulnerable to infection and spread into the general community, particularly in areas with low literacy rates and socioeconomic status.[15]

CONCLUSION

In the present study, prevalence of HCV infection among the FSW and female blood donors is low. Co-infection of HCV-HIV was not observed in any of female among both the population. Maximum positivity rate in age group 18-24 years which is due to the less awareness of the disease in younger age. Low prevalence among study area suggests that Targeted intervention among this risk group is effective measure in decreasing the HCV and HIV co-infection rate. Education status of FSWs is important factor for proper implementation of prevention mode for the infection.

REFERENCES

1. National AIDS control Organisation. Targeted Interventions [Internet]. National AIDS Control Programme, Phase-III, India. Pg 10-11. Available from: www.nacoonline.org.
2. Dandona R, Dandona L, Gutierrez JP, Kumar AG, Mcpherson S, Samuels F, et al. High risk of HIV in non-brothel based female sex workers in India. BMC Public Health. 2005, Aug 20;5:87.
3. Desai PS, Dutta A, Shastri JS. A study on the HBV and HCV infections in female sex workers and their co-infection with HIV. J Clin Diagn Res. 2013 Feb; 7(2):234-37.
4. Winn WC, Allen SD, Janda WM, Koneman EW, Procop GW, Schreckenberger PC, Woods GL. Clinical manifestation of viral infections and Diagnosis of viral infections In Koneman's Color Atlas and Textbook of Diagnostic Microbiology, 6th Ed, Lippincott Williams & Wilkins, Philadelphia, 2006: p 1333-03.
5. Ray SC, Thomas DL. Hepatitis C. In Bennett JE, Dolin R, Blaser MJ (eds). Mandell, Douglas and Bennett's Principles and Practice of Infectious Diseases, Vol.2, 8th Ed, Churchill Livingstone, USA; 2015: p.1904-27.
6. Fauci AS, Lane HC. Human Immunodeficiency Virus Disease: AIDS and Related Disorders. In Kasper DL, Hauser SL, Jameson JL, Fauci AS, Longo DL, Loscalzo J, Harrison's Principle of Internal Medicine 19th ED, McGraw-Hill Education;2015:p.1 215-84.
7. Barth RE, Huijgen Q, Taljaard J, Hoepelman AIM. Hepatitis B / C and HIV in sub-Saharan Africa : an association between highly prevalent infectious diseases. A systematic review and meta-analysis. Int J Infect Dis. 2010;14(12):1024–31.
8. Shafran SD. Hepatitis C and the sex trade. Can J Gastroenterol Hepatol 2015;29(8):405–6.
9. Bajaj A, Pandey RP, Rana V. A Clinical Study of prevalence of Hepatitis B Virus, Hepatitis C Virus and Syphilis (T. Pallidum) in HIV positive patients. Sch. J. App. Med. Sci. 2015; 3(3):1490-96.
10. NACO Guidelines on HIV testing. March 2007.
11. Kweon SS, Shin M, Song H, Jeon D, Choi J. Seroprevalence and risk factors for hepatitis C virus infection among female commercial sex workers in south Korea who are not intravenous drug users. Am. J. Trop. Med. Hyg. 74(6), 2006; 74(6):1117–21.
12. Todd CS, Nasir A, Stanekzai MR, Bautista CT, Botros BA, Scott PT et al. HIV, hepatitis B, and hepatitis C prevalence and associated risk behaviors among female sex workers in three Afghan cities. AIDS. 2010 July; 24(0 2): 69–75.
13. Sandesh K, Varghese T, Harikumar R, Beena P, Sasidharan VP, Bindu CS, et al. Prevalence of Hepatitis B and C in the normal population and high risk groups in north Kerala. Trop Gastroenterol 2006; 27:80-3.
14. Treviso FS, Custódio G, Silva AC, Oliveira MB, Wolfart A, Trevisol DJ. HIV, hepatitis B and C, and syphilis prevalence and coinfection among sex workers in Southern Brazil.Rev Soc Bras Med Trop, 2013 Jul-Aug 46(4):493-97. Sarkar K, Ganguly DN, Bal B, Saha MK, Bhattacharya SK. Hepatitis B Infection, Eastern India. Emerging Infectious Diseases, Vol. 2004 July; 10(7):1341-42.