

**PREVALENCE OF SEXUALLY TRANSMITTED  
INFECTIONS AMONG FEMALE SEX WORKERS  
ATTENDING  
INSTITUTE OF VENEREOLOGY**

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# **CERTIFICATE**

Certified that this dissertation entitled **“PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS AMONG FEMALE SEX WORKERS ATTENDING INSTITUTE OF VENEREOLOGY”** is a bonafide work done by **DR.L.SORNAKUMAR,** Post Graduate Student in **M.D. Dermatology, Venereology and Leprosy,** Madras Medical College, Chennai – 600 003, during the academic year 2005 – 2008. This work has not been formed previously the basis for the award of any degree.

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## INTRODUCTION

For a communicable disease to be maintained in a population, an infected individual must infect on an average more than one new susceptible, resulting in a basic reproductive rate for the disease of one or greater. For sexually transmitted disease the basic reproductive rate is the product of the transmission efficiency of the disease pathogen, the effective rate of partner change in the population and the average duration of infectiousness.

In the wake of HIV/ AIDS epidemic in India, the sexual behaviour and related risk factors among various vulnerable populations have caught the imagination of the researchers and policy programmers. It is more and more felt that some sections of populations are especially vulnerable because of their marginality, lack of social support and other factors. Of all the vulnerable population towards HIV/ AIDS, Female sex workers occupy a special niche.

Female sex worker [FSW] is a person who provides sexual service for immediate cash or a kind in return. The phenomenon of a small number of women having sex with a more number of men is extremely important in STD epidemiology.

FSWs are highly tabooed and highly stigmatized. Sex workers are illegal persons in our country. Therefore FSWs are harassed by police and others. As a result of the all hard hostility, FSWs tend to hide their behaviour from others, even from their families. Owing to this, it can be safely assumed that the number of FSWs in this society is larger than that meet our eyes.

In developing countries, men purchase sex from female prostitutes more frequently. In the recent past, HIV prevalence among the population of FSWs in different cities across the world is found to be high and is rising fast <sup>1</sup>. E.g. Chiang mai (Thailand) – 30%, Mumbai (India) – 60% (1994), Congo – 28% (1996)

Making good quality STI care and services available and accessible to sex-workers could effectively reduces transmission of STDs and HIV.

In this study, efforts have been made to assess the pattern of STI among FSWs as well as to document their sexual behaviour, who attends the out patient clinic of the Institute of Venereology, Government General Hospital, Chennai from 1<sup>st</sup> January '06 to 15<sup>th</sup> August '07.

## **REVIEW OF LITERATURE**

### **Sexually Transmitted Infections**

Sexually Transmitted Infections (STIs) represent a major public health problem. STIs are the cause of acute illness, long term disability and death in men, women and infants with tremendous economic consequences at individual and community level <sup>2</sup>.

The older terminology of “Venereal Diseases” largely has been superseded in the past 50years by “Sexually Transmitted Diseases (STDs)” and more recently by Sexually Transmitted Infections (STIs) <sup>3</sup>. It has been changed because many infections remain asymptomatic for many years (or) would never develop symptoms.

### **Origin and Nature**

Sexually Transmitted Infections have an interesting history because they are believed to have existed since earliest times. Their transmission is related to human nature and frailties and they can have devastating effects on the body, on the mind and psyche and on the ability to procreate<sup>4</sup>.

A wide variety of microorganisms (Bacteria, Virus, Fungi and Protozoa) and a few ectoparasite, arthropods (Pediculosis, Sarcoptes scabiei) have evolved to depend in whole or in part upon the human genital tract and human sexual behaviour for their survival. Because sexual behaviour is essential to preservation of species, instinctual and driven by highly developed, neuron-chemical pleasure reward system, it offers both a reliable ecological niche for infectious agents as well as a daring challenge to modern day practitioners<sup>5</sup>.

### **Commercial Sex Workers**

**Terminology**<sup>6</sup>: The English word **WHORE** referring to prostitutes is taken from the old English word **hora** but usage of that word is widely considered a less vulgar and value laden term. The great degree of social stigma associated with prostitution, of both buyers and sellers, has lead to the terminology such as Commercial Sex Workers” (or) “Commercial Sex Trade” (or) “Sex Trade Worker”. Organizers of prostitution are typically known as pimps (if male) and madams (if females). More formally they practice procuring and are procurers (or) procuresses.

### **Types**

**Street Prostitution:** The prostitute solicits customers while waiting at street corners (or) walking the street usually dressed in skimpy clothing. The sex is performed in customer’s car, in a nearby

alley, or in rented rooms. Street prostitutes are often motivated by drug addictions.

**Brothels:** Brothels are establishment specifically dedicated to prostitution often confined to special red-light areas in by cities. Prostitution also occurs in some massage parlours, and in Asian countries in some barber shops.

**Escort Prostitution:** Here, act takes place at customers place of residence or more commonly at his (or) her hotel room (out call) or at the escort's place of residence or in a hotel room rented for the occasion by the escort (in call).

**Sex Tourism:** In sex tourism, travellers from rich countries travel to poor countries in search of sexual services that may be unavailable in their own countries or simply too expensive.

**Lot Lizard:** Lot lizard is a commonly encountered special care street prostitution mainly serving those in truck industry at truck stops and stopping centers.

**Prostitutes and Internet:** Prostitutes use the internet to find customers. A prostitute may use adult boards or create a website of their own with contact details such as email addresses.

## **Ancient and Medieval History in India**

### **Origin:**

“**Devadasis**” Sanskrit word means “Servant of God” are colt prostitutes in the service of the **Yellamma**, Hindu Goddess of Fertility<sup>7</sup>.

The term originally described a Hindu religious practice in which girls were “married” to deity. In addition to taking care of the temple, they learned and practiced dances, traditional arts and enjoyed high social status. The popularity of devadasis seems to have reached its pinnacle around 10<sup>th</sup> and 11<sup>th</sup> century. Invaders from west Asia attained their victory in India. The destruction of temples by Invaders started from the North West Borders of country and spread the whole country. Thereafter the status of the temples falls very quickly in North India and slowly in South India. As the temples became poorer and lost their patron kings, the devadasis were forced into a life of poverty, misery and in some cases, prostitutes.

### **Quantitative Studies conducted in India Include:**

- In 2002, The Indian Community Welfare Organization (ICWO) conducted an ethnographic study which identified 6,300 women involved in the sex trade in Chennai, working mostly off the

streets and from their homes and some through brothels and illegal brokers<sup>8</sup>.

- Over 30% of them had come from different places in Andhra Pradesh<sup>8</sup>.
- STI prevalence in women engaged in prostitution was 56%<sup>9</sup>.
- HIV prevalence among FSWs attending STD clinics in Pune was 54% (1993-2002)<sup>10</sup>.
- According to ten year study done in Pune among FSWs 34% reported consistent condom use, 52% reported irregular condom use, 14% had never used<sup>10</sup>.
- According to study at Surat, 58.5% FSWs had no symptoms related to STDs at the time of examination<sup>11</sup>.
- Prevalence of different STIs and HIV among FSWs in the Surat red light area is high despite high reported condom use with clients<sup>11</sup>.
- FSWs had 570 client contacts per year<sup>12</sup>.
- In 2005, NACO reported partial results from studies across India to “Map” (or) count FSW. These partial results showed 16800 FSWs in the first 22 states with complete mapping<sup>13</sup> which can be extrapolated to about 3,00,000 in India (all of women).

Subsequently, an expert group to NACO has estimated 8,30,000 to 1.24 million FSWs.

- In general population surveys during 2001, 7.4% of men in Chennai slums <sup>14</sup> reported ever paying money for sex.
- In 13 surveys among truckers across India and in Tamilnadu and Maharashtra during 1996-2004, 8.4 – 38% (median 22%) of truckers and or helpers reported one (or) more FSW partners in the past year
- In 2001 National survey, clients intercepted after visiting FSWs reported a mean of 3.9 commercial partners in the previous 3 months

#### **STI Trends in FSWs in developed countries:**

- Mongolia has very low prevalence of HIV despite high rates of STIs. No HIV infection found among the FSWs in the study group. 43%, 14%, 28% are tested positive for syphilis, gonorrhoea, and trichomoniasis<sup>15</sup>.
- 1.4% were positive for antibodies to HCV among FSWs in South Korea<sup>16</sup>.

- Pattern of sexually transmitted diseases among CSWs in Nigeria during 2002 shows, vaginal candidiasis was the most common STD diagnosed.
- The other STDs in their order of frequency were HIV 34.3%, Bacterial vaginosis 24.9%, TVV 21.9%, Scabies 7.7%, Genital wart 6.5%<sup>19</sup>.

#### **STD Prevalence among FSWs in India:**

- In 2003, a study from Manipur analysis of 1903 FSWs, most cases was in the age group 20 – 30years (50.86%).  
Following pattern of STDs were found, 38-90% - Syphilis, 27.65% -Ulcerative lesions, 29-68% were HIV Sero-positive<sup>17-18</sup>.
- In 2005, a study from Surat, analysis of 200 CSWs, 59.3% were married. 59% CSWs did not report Genito-urinary complaints. Lower abdominal pain was the most common complaint (19.5%). 22.9% positive for TPHA. 14.4% diagnosed as TVV. 16.9% had positive GC culture<sup>20</sup>.
- In a study in 2005, prevalence of Bacterial vaginosis in FSWs in Chennai was 45%<sup>21</sup>.

## **Sexually Transmitted Infections among FSWs**

Even before the first AIDS case diagnosed among FSWs, they were already in the midst of an epidemic of STDs. Core groups such as sex workers and their clients, because of their high rates of partners change are important in the transmission dynamics of all STDs. Some of the common STDs among FSWs are discussed below.

### **Syphilis**

At the height of the U.S Syphilis epidemic in the early 20<sup>th</sup> century, 25% of all cases of Syphilis were estimated to have been transmitted through commercial sex<sup>22</sup>.

Syphilis is also highly prevalent among prostitutes in developing countries.

In a group of CSWs in Surat the percentage of TPHA positivity was 22.9%.

In a large group of over 3000 female sex workers in Mexico City the prevalence of Latent asymptomatic syphilis was 8.2%<sup>23</sup>. The prevalence in commercial sex workers in Comeroon and Mauritius was 11.3% and 32% respectively<sup>24</sup>.

Epidemiologic analysis from Sub-Saharan Africa showed a transmission possibility in early infectious syphilis of approximately 0.3% from male to female and 0.2% from female to male<sup>25</sup>.

The variable factors that influence the transmission of infections include the number of exposures, the type of sexual activity and the morphology and distribution of lesions in the infected partner<sup>26</sup>.

Substantial debate has occurred regarding how HIV infection affects the presentation and management of syphilis infections. Recent studies have documented that HIV infected patients are more likely to present with multiple chancres and overlap of primary and secondary manifestations<sup>27</sup>.

Since HIV infected patients might be more likely to have a previous syphilis infection, serologic titers observed in HIV infected patients have been higher at initial presentation and have a slower decline<sup>28</sup>.

The diagnosis of syphilis in both HIV infected and non-HIV infected persons is reliably made by the use of dark field microscopy of the exudates from primary (or) secondary lesion. Both the Venereal Disease Research Laboratory (VDRL) and Rapid Plasma Reagin (RPR) tests are commercially available. Early case reports suggesting the unreliable nature of syphilis serology in HIV infected patients has not been substantiated. HIV infected patients with syphilis should undergo close follow-up at 3, 6,9,12 and 24 months. A four fold decline in titer at

6 months in the patients with late infections is usually consistent with adequate response to treatment.

The development of alternate therapies to penicillin is among treatment advances for syphilis. Long acting Benzathine Penicillin G is still recommended STD therapy for the treatment of syphilis. The recommended alternative therapy for penicillin allergic patients is Doxycycline. Data have shown that 1g Azithromycin is efficacious in the prevention of syphilis in person exposed. A recent pilot study shows that a single dose of 2g Azithromycin is efficacious in the treatment of early syphilis<sup>29</sup>. Azithromycin offers the advantage of a non-injectable antimicrobial and use in patient – delivered partner therapy, in addition Azithromycin targeted mass chemoprophylaxis has been used to control syphilis in endemic and outbreak situations<sup>30</sup>. The use of treatment other than penicillin required close follow up.

## **Gonorrhoea**

The prevalence of Gonococcal infection in African women is also very high ranging from 20 – 40% among prostitutes. A study from Bangladesh has shown disease positivity in 35.5% of the female sex workers<sup>31</sup>.

In India, however over the years there has been a steady decline in its incidence, which may be attributed to improved medical facilities at the primary health level, indiscriminate use of over the counter anti-bacterial drugs for unrelated illness, prophylactic use of antibiotics after sexual exposure and growing awareness about AIDS in the Indian population.

In developing countries, the apparent ratio of male to female cases is 10:1 with 80 – 90% men acquiring infection from commercial sexual workers<sup>32</sup>. A prospective cohort study performed on brothel-based female sex workers who practiced oral sex revealed that 5.2% workers contracted pharyngeal gonorrhoea<sup>33</sup>.

The disease is asymptomatic in approximately 75-80% of the women which makes them an efficient reservoir for disease perpetuation among their male contacts<sup>34</sup>.

Its incubation period varies from 1-14 days, with an average 2-5 days. Asymptomatic infection occurs at urethra, endocervix, rectum, and

pharynx. The primary site of infection in female is the endocervical canal. The organism colonizes the urethra, Bartholin's and Skenes gland and spreads to involve the cervix, uterus, fallopian tube and pelvis whereas vulva, vagina, bladder and upper urinary tract are relatively spared. It causes urethritis, Bartholinitis, Bartholins abscess, cervicitis, proctitis, pharyngitis, conjunctivitis which later leads to complication like skenitis, parametritis, cystitis, PID, infertility and systemic involvement such as meningitis, conjunctivitis, panophthalmitis, pneumonitis, Fitz-Hugh-Curtis syndrome, septicaemia, arthritis, dermatitis.

In pharyngeal gonorrhoea, disease transmission to sex partner is inefficient and rare. However pharyngeal gonorrhoea is a risk factor for developing disseminated Gonococcal infections<sup>35</sup>.

The diagnosis of gonorrhoea continues to be predominantly by culture, and PCR. The recommended treatment for uncomplicated gonococcal infection, Inj. Ceftriaxone 250mg I.M as a single dose (or) T.Azithromycin 2g stat which will also cure the co-associated Chlamydial infection.

## **BACTERIAL VAGINOSIS [BV]**

Bacterial vaginosis is the most common abnormal vaginal condition and is the leading cause of abnormal vaginal discharge accounting for up to 48% of cases<sup>36</sup>.

In Thailand, 33% of FSWs had BV compared to the 16% prevalence found among pregnant Thai women<sup>37</sup>. BV was diagnosed in only 18% of women hospitalized with complications of AIDS<sup>38</sup>. BV is commonly found in 44% HIV positive commercial sex workers<sup>39,40</sup>. In a study of 100 women with vaginal discharge at Patiala, BV was seen in 48%<sup>42</sup>. The vaginal swabs collected from FSWs were Gram's stained and analyzed for BV by Nugent's scoring criteria shows 45% positivity<sup>41</sup>.

Three cohort studies found that women having exposure to new sex partners (or) multiple sex partners had an increased incidence of BV<sup>43</sup>. Gardner and Pheifer et al detected *G.vaginalis* in the urethra of 79% of male sex partners of women with BV but not in male controls. Risk factors include those with a history of Bacterial STD, increase number of life time sex partners and lower age of first intercourse<sup>44</sup>.

BV is the commonest cause of vaginal discharge. Patients present with malodorous vaginal discharge although many are asymptomatic. Non viscous, homogenous, white inflammatory discharge that smoothly

coats the vaginal walls, often visible on the labia and fourchette with characteristic odour are the features of BV<sup>45</sup>.

Amsels et al <sup>46</sup> proposed criteria for diagnosis of BV. Diagnosis requires three (or) more following features

1. Excessive homogenous uniformly adherent vaginal discharge
2. Elevated vaginal pH >4.5
3. Positive amine test (whiff test)
4. Clue cells (20%)

### **BV & HIV**

Decreased Lactobacilli leading to less H<sub>2</sub>O<sub>2</sub> production which is toxic to HIV. Loss of low vaginal pH which may inhibit CD4 activation also increases HIV. BV has also been shown to increase vaginal levels of IL-10 which increases the susceptibility of macrophage to HIV.

Complications of BV are increased rate of miscarriage, pre-term delivery, LBW, PROM, postpartum endometritis, vaginal cuff endometritis, spontaneous PID, abortions.

An inhibitory effect of bacterial amines, putrescine and cadavarine on the cell division and germ tube formation of *Candida albicans* has recently been reported <sup>47</sup>.

According to WHO, treatment is T.Metronidazole 400mg BD for 7 days (or) T.Metronidazole 2g single oral dose. 30% of patients have recurrence of symptoms within 3 months.

Treatment of male sex partners has not been beneficial in preventing the recurrence BV<sup>48</sup>.

### **VULVO VAGINAL CANDIDIASIS (VVC)**

About 70 -75% of women will have atleast one lifetime episode, with 40 50% suffering a recurrence<sup>49</sup>. In a study 100 women with vaginal discharge at Patiala, candidiasis was seen in 26%<sup>42</sup>.

A study of HIV/ STD infections among CSWs in Kolkata shows 13.26% were affected with VVC<sup>50</sup>.

Risk factors for VVC are increasing use of antibiotics, OCP, douching, feminine hygiene products, tight non cotton pants. The incidence increases with the onset of sexual activity, use of sponges and IUCDs<sup>51</sup>.

Typical symptoms of VVC include itching, vaginal discharge, vaginal soreness, vulval burning, dyspareunia and external dysuria. Diagnosis of VVC depends upon demonstration of yeast (septate) in vaginal secretions in 10% KOH, culture, PCR. Treatment is by oral

T.Fluconazole (150mg 2doses at 3days interval) and with topical 2% Clotrimazole cream.

### **VVC and HIV**

RVVC was described as a presenting marker of underlying HIV. There was increased incidence of VVC and trichomonas infections with fall of CD<sub>4</sub> cell count. A study assessing the effect of treatment of vaginal infections on the shedding of HIV in 98 patients with VVC showed that vaginal HIV RNA decreased after treatment.

Treatment of VVC resulted in a 3.2 fold reduction in concentration of HIV in vaginal secretions and a 3 fold decrease in the likelihood of detecting HIV infected cells<sup>52</sup>. In another prospective study of 205 HIV positive women, it was shown that the risk of developing symptomatic VVC increased 6.8 times for women with CD<sub>4</sub> cell count less than 200 cells/ $\mu$ L<sup>53</sup>.

The authors reported there is increased severity and duration of episodes of VVC<sup>54</sup>. The author concluded that HIV positive women with RVVC are at serious risk for rapid progression to AIDS, as are males with recurrent oral thrush<sup>55</sup>.

## **TRICHOMONAS VAGINALIS VAGINITIS [TVV]**

*T.vaginalis* is almost exclusively transmitted by sexual intercourse. More than 200 million people worldwide are infected with this parasite annually<sup>56</sup>. Prevalence rates have ranged from 5-10% in general population and 50-60% in commercial sex workers. The highest prevalence occurs during the years of peak sexual activity, in patients attending STD clinics and in commercial sex workers.

A study of HIV/ STD Infections amongst commercial sex workers in Kolkata shows the prevalence of 23.64%<sup>50</sup>. A similar study on prevalence of HIV and Sexually Transmitted Infections among low income female commercial sex workers in Mongolia had prevalence rate of 28%<sup>15</sup>. A study done at Nigeria shows the prevalence of 21.9% among the commercial sex workers<sup>57</sup>. The prevalence of Trichomoniasis varies from 5.7 to 60.6% in different parts of India.

*T.vaginalis* ingest and readily kills Lactobacilli and other bacteria in-vitro<sup>58</sup> and thus it seems unlikely that trichomonads serve as “**Trojan Horse**” vectors, which ingest other STDs pathogens and carry them undamaged into a new human host<sup>58-59</sup>. Older literature suggests that some treatment failures in patients with gonorrhoea resulted from protection of viable gonococci within Trichomonads<sup>59</sup>. However, when *T.vaginalis* were mixed with suspension of *N.gonorrhoea*, *M.hominis*

(or) *C.trachomatis* in-vitro, most gonococci were killed within 6 hours, and all *Mycoplasmas* were killed within 3hours<sup>59</sup>. 30-50% of women with gonorrhoea also have had *T.vaginalis*.

Trichomoniasis is a urogenital infection. *T.vaginalis* is isolated most often from lower urogenital sites. In women these sites include the vagina, cervix, urethra, bladder, bartholin's and skene's gland. In men the organism has been isolated from the anterior urethra, external genitalia, prostate, epididymis and semen.

The organism is seen in 14-60% of male sex partners of infected women and 67-100% of female partners of infected men<sup>60</sup>. The incubation period for *T.vaginalis* infection is between 4-28days. Symptomatic women present with vaginal secretion were usually copious, homogenous, frothy, and malodorous with pH of 4.5 and yellow green colour. On colposcopy colpitis macularis (or) strawberry cervix is visualized. Rarely present with lower abdominal pain, post coital spotting. Most common manifestation in men is urethral discharge (or) urethritis.

Diagnosis is done by demonstration of organism in wet mount of vaginal discharge, phase contrast microscope, culture (or) by using In-pouch TV, Immunological and Molecular methods.

Treatment is T.Metronidazole 400mg BD for 7days (or) single dose T.Metronidazole 2g orally. Partner treatment is justified with protective sex till completion of the treatment.

### **Herpes Progenitalis**

The incidence has increased manifold in the last two decades and has assumed major public health significance especially because of association with HIV infection. The reasons for its increase are the decrease in the treatable bacterial STDs, the high recurrence rates and asymptomatic recurrence with transmission in the absence of symptoms. In Chandigarh, India a four fold increase of genital herpes was observed in STD clinic attendees from 1977 to 1990<sup>61</sup>.

Genital Herpes is the most common cause of genital ulceration in the developed world<sup>62</sup>. Ambrose et al <sup>63</sup> reported a very high prevalence (40.22%) of HSV-2 antibodies in Indian patients with genital ulcer.

Most cases are caused by HSV-2; however the incidence of genital herpes caused by HSV-1 is increasing<sup>64</sup>. The recent increase in isolation of HSV-1 from genital lesions of herpes is probably because of greater frequency of practice of fellatio and cunnilingus<sup>25</sup>. The transmission of HSV-2 is more frequent in women from men than in

men from women. The higher rate of asymptomatic infection in men may be a factor in the higher risk of male to female transmission.

A recently published report indicates that bacterial vaginosis appears to enhance the risk of acquisition of genital herpes simplex infection<sup>66</sup>.

Risk factors for genital HSV infections include multiple sex partners, advent of sexual activity at 17 years of age or younger, history of other STDs, HIV infection, history of undiagnosed genital lesions or discharge, relatively low educational level, low socio economic status and partner with diagnosed genital HSV infection<sup>67</sup>.

Genital herpes caused by HSV-2 is recurrent in 90% or more of those infected and 88% have at least one recurrence during 12 months after the initial episode<sup>65</sup>. The mean rate of recurrence in HSV-2 genital infection is 0.3 to 0.4/ month<sup>68</sup>. The mean time from onset of lesions to complete healing is longer in women (20 days) than in men (16.5 days).

### **Genital Herpes and HIV**

Genital Herpes is the most common STD in HIV Sero-positive individuals. The frequency of HIV Sero-positivity in genital herpes patients has varied from 0.5% (1995) to 20% (1999) in various parts of India<sup>69</sup>.

Genital Herpes in immuno-compromised HIV patients' tend to be more severe, extensive, and difficult to treat and for most of them, recurrence are also frequent.

Patient with recurrent Genital Herpes may experience shame and guilt or withdrawn from social interaction and intimate relationship because of concerns about undesirability, disapproval and rejection, leading to increased isolation and withdrawal<sup>70</sup>.

Genital Herpes Infections cause a substantial amount of morbidity in FSWs with symptoms ranging from recurrent itchiness, redness or burning sensation to blisters and sores and genital neuropathic pain.

These manifestations can involve labia majora, labia minora, the clitoris, the perineum, at the introitus, cervix, anus or rectum, buttocks and mons pubis. Definitive diagnosis is often difficult because it requires isolation by culture of HSV from the affected area; laboratories will routinely identify the subtype using direct fluorescent types – specific antibody of HSV from clinical specimen. Serologic testing might be helpful to rule out infections because the Sero-positivity of HSV-1 and HSV-2 in the general population is about 70% and 22%, respectively. Recent data demonstrate that asymptomatic viral shedding is 4 times more common in HIV Sero-positive than in HIV Sero-negative women.

Genital ulcers facilitate HIV transmission through the reduced epithelial barrier and infiltration of CD<sup>4+</sup> lymphocytes in herpetic lesions that are possible targets for HIV attachment and entry. There is a transactivation between both HSV and HIV infections.

The most important recent advances in the treatment of genital HSV have been the US FDA approval of Valacyclovir 500mg orally twice daily for 3 days for recurrent infections and the recent demonstration of the efficacy of Acyclovir, 800mg orally 3 times per day for 2 days<sup>71</sup>.

### **Human Papilloma Virus and Anogenital Warts**

Anogenital warts have been recognized as a disease entity for many centuries. They were certainly recognized by early Greek and Roman Physicians, such as Hippocrates and Galan. The term 'Condyloma' is derived from the ancient Greek, meaning 'a round swelling adjacent to the anus'. The addition of the suffix 'acuminate' is a relatively new feature, appearing towards the end of the 19<sup>th</sup> century. In 1980, Gissman and Zarhausen, has dated and characterized HPV from a genital wart, thus defining the etiological agent for the development of Anogenital warts.

The prevalence of genital warts in India has been reported to be 5.1% to 25.2% of STD patients<sup>72</sup>. In a report by Arora et al, the incidence of Anogenital warts had increased from 7.2% to 8.8% among the HIV infected patients over a period of 5 years<sup>73</sup>.

Genital HPV infections are transmitted primarily through sexual contact. The infectivity of HPV between sexual partners is estimated to be 60%. Digital transmission, perinatal transmissions have been reported. Almedia et al<sup>74</sup> showed “one way cross reactivity” between cutaneous and Anogenital warts. The cutaneous warts are auto-inoculable on to genital mucosa, whereas the genital warts are not able to produce any lesions on the glabrous skin. The lesions appear after the incubation period of 1-8 months with an average of 3 months. In women the common sites involved are posterior part of the introitus, labia, perineum and perianal area. Vagina and cervix are affected more commonly in sub-clinical infections. Risk of transmission to malignant lesion is reported.

Only clinically apparent and cytologic alterations remain the most frequently applied diagnostic criteria for genital HPV<sup>75</sup>. Some authorities recommend biopsy of the lesion is of the macular or papular variety and the patient is over 35years old<sup>76</sup>. There is no evidence to support the use of HPV typing of the Anogenital warts; it does not add

any information that is clinically useful. The sensitivity of Pap smear is poor, though specificity is very high (90%). Serology has little value in the diagnosis because of low sensitivity and low specificity. Molecular technique is considered as gold standard but they are too cumbersome and slow for routine use<sup>75</sup>. It is implied only for research purpose and for quality control.

Treatment for external genital warts includes provider (or) patient applied therapy such as liquid Nitrogen, Podophyllin 25%, TCA 15%, Imiquimod 5% (or) Podofilox gel. Patient applied topical applications appear more efficacious on mucosal sites and other areas that are less keratinized. One advantage of 5% Imiquimod is that it might be associated with a reduced recurrence rate because it activates host immunologic mechanism to clear infections rather than simply ablate the wart<sup>77</sup>. Recurrence of warts following use of auto implantation technique was significantly less than in a comparable group treated with podophyllin<sup>78</sup>.

## **HIV**

With continuing high levels of other STDs amongst some group of prostitutes, the potential for epidemic spread of AIDS was clear as soon as the mode of HIV transmission was understood. High levels of HIV infection have been found among prostitutes in countries where the virus is predominantly transmitted through hetero-sexual contact.

### **Relationship between the vaginal ecosystem and HIV<sup>79</sup>**

H<sub>2</sub>O<sub>2</sub> producing Lactobacilli were critical to HIV, the first clinical data suggesting that the presence of vaginal Lactobacilli may protect against hetero-sexual transmission of HIV. Women with Lactobacilli predominant vaginal flora as assessed by Gram's stained vaginal smears, had a 14% prevalence of HIV, women with reduced Lactobacilli by vaginal smear, had a 40% increase in the seroprevalence of HIV<sup>79</sup>. Women with severe Bacterial vaginosis had a 90% increased risk of HIV.

### **STIs in HIV Infections**

Wasserheit<sup>80</sup> has called this relationship 'Epidemiological Synergy' a phrase that emphasizes that STIs enhance HIV-1 transmission. In a study done in STD clinic, Pune, India<sup>81</sup> patients who had GUD were more than 4 times as likely to seroconvert as those without GUD. HIV-1 DNA was significantly increased in cervico-

vaginal fluids of patients with STIs. A week after treatment for STI, detection of HIV-1 in their secretions decreased from 42% to 21%. Non ulcerative STIs increases risk primarily for the receptive partners – female from male<sup>82</sup>.

Chlamydia trachomatis increases the replication of HIV-1 through the generation of reactive oxygen products secreted by granulocytes<sup>83</sup>. Treponema pallidum lipoproteins have been shown to increase HIV-1 replication. Mostad et al<sup>84</sup> noted a significant increase in detection of HIV-1 swab samples from women with Gonococcal cervicitis and vaginal candidiasis but not in those with Trichomoniasis (or) Chlamydial infections. In tissues co-infected with HSV-1, HIV virions appear to be able to infect keratinocytes that lack CD<sub>4</sub> receptors and are not usually vulnerable to HIV infection<sup>85</sup>. In-vitro studies have shown that intracellular HIV-1 tat mRNA can transactivate HPV type 16 E6 and E7, an action that is important in development of SCC.

### **HIV and FSWs in India**

Surveillance for HIV infection was initiated in India by ICMR in late 1985 as a part of AIDS task Force; Anti-HIV antibodies were first detected among sex workers from Chennai in 1986.

Human Immunodeficiency virus infection is the most important STD associated with sex work, Sex workers and their clients are major

groups at risk of acquiring and transmitting HIV. Genital tract infections and inflammation probably increase HIV shedding in the female genital tract, rendering a woman more infectious to a sexual partner.

Chim and Jain and colleagues estimate 10% and 30% respectively, of FSWs to be HIV positive in the early 1990s. They later estimated 10-33% of FSWs to be HIV positive in 1995 -99. because of limited number of studies and sentinel sites among FSWs; we use information from STD clinic to estimate HIV among FSWs. The proposed best and high estimates for HIV prevalence among FSWs of 15% and 20%, approximately 2.5 and 3.5 times HIV prevalence in STD clinics.

### **HIV Transmission per Coital act**

Considering that many FSWs and clients in India are infected with a STD, proposed best and high estimates 0.0011 and 0.002 HIV transmissions per unprotected coital act<sup>86</sup>.

The sexual transmission of HIV between FSWs and clients account for 44% to atleast 68% of HIV infections among Indian adults.

A 2003 survey reported HIV prevalence of 4% among FSWs in Chennai in 2004<sup>87</sup>. India's epidemic seems to be following the so called Type 4 partner. The epidemic shift from the highest risk group FSWs

(core group) to the general population through their clients (bridge population).

It is likely that anal intercourse precedes at least two modulates of infection:

1. Direct inoculation into blood in cases of traumatic tears in the mucosa.
2. Infection of susceptible target cells, such as Langerhan cells in the mucosal layer in the absence of trauma.

### **Vulnerability of FSWs to HIV**

Women are biologically more susceptible to HIV infection than men. Male to Female transmission of HIV is 2-4 times more efficient than female to male. This is because women have a larger mucosal surface exposed during sexual intercourse. Poverty, lack of education and limited income earning opportunities often propel women to commercial sex, significantly increasing their risk of infection. There is for example a sharp increase in HIV prevalence rates among CSWs in Mumbai from 1% to 5% between 1987-1993. The risk of HIV transmission is known to increase with the number of male partners a sex worker has intercourse within the course of a day work. Clients' unwillingness to use condoms further accentuates women's risk. Many STDs in women are asymptomatic and therefore less likely to be

recognized and multiplies the risk of HIV infection by 300 – 400%. Hence specific interventions targeting FSWs should also be included in the control of HIV and STDs.

Oral sex is a much less efficient mode of transmission of HIV than receptive anal intercourse.

### **Prevention of STDs & HIV among FSWs**

Given the importance of sex workers and their clients in STD epidemiology, a key component of STD/ HIV control strategies should be intervene among these groups.

Two general approaches to interventions are possible.

#### 1. Directed at sex work

- Criminalizing prostitution
- Penalizing clients of prostitutes
- Regulating legalized prostitution
- Reducing the supply of prostitutes
- Reducing the demand for prostitutes

#### 2. Directed at reducing STD transmission

- Decreasing STD prevalence in sex workers
- Decreasing STD transmission from sex workers to clients  
and from clients to sex workers

But prostitution will not disappear as a result an act of parliament or a police crackdown. Instead it makes the condition worse by moving to less visible places and making it harder to find for the purposes of health intervention<sup>90</sup>.

Prevention of HIV/ STIs through sexual abstinence is a desirable but impractical objective<sup>88</sup>. Therefore programmes must emphasis on safer sexual behaviours like<sup>89</sup>,

- Reduction in the number of sexual partners
- Avoidance of risky sexual practices
- Where indicated the consistent use of barrier method such as condoms
- A change towards appropriate health care seeking behaviour where infection is suspected

Decreasing the transmission of STDs is mainly done by using condoms. A study among CSWs has shown that those who had access to both male and female condoms had lower incidence of STIs. 2.8 of the infections / 100 women per week compared to 3.7 infections per woman per week in case of those using male condoms only.

Policy planners all over the world have realized that efforts to increase condom use are a good, social, economic and health investment.

Decriminalizing prostitution may prove to be an important public health intervention which would improve the control that prostitutes have over their own work and access that they have to medical care. Effective interventions can promote the practice of safer prostitution which will reduce the contribution of prostitution to epidemics of infectious disease<sup>90</sup>.

## **AIM OF THE STUDY**

1. To study the pattern of Sexually Transmitted Infections among Female Sex Workers.
2. To study about the age distribution, socio economic background, educational level and marital status among the FSWs.
3. To study the prevalence of condom usage by the clients of Female sex workers in the study group.
4. To study the pattern of Sexually Transmitted Diseases among HIV infected Female Sex Workers.
5. To study the sexual behaviour pattern among Female Sex Workers

## **MATERIALS AND METHODS**

### **STUDY DESIGN**

Prospective observational study

### **SAMPLE**

The study population comprised of FSWs attending the Institute of Venereology Government General Hospital, Chennai from Jan 1 2006 to Aug 15<sup>th</sup> 2007.

The majority of the patients were referred by non governmental organizations and vigilance home apart from self referral and referred by other medical departments.

During the study period a total of 440 FSWs were registered and observed.

### **METHODS**

The study patients were interviewed regarding their age, educational status, marital status, presenting complaints, sexual history, past history of venereal diseases and the number of clients per workers and their condom use.

All the patients were counseled on STD/ HIV, genital hygiene, sexual practices, regular treatment and follow up. They were given pre and post test counseling.

All the patients underwent a complete physical examination and genital examination. Except antenatal women and women during menstruation, other patients were examined with cuscus bivalved self retaining speculum. All these patients were clinically analyzed for the genital manifestations and supported by laboratory diagnosis.

Screening for sexually transmitted diseases was done. Serological tests for syphilis including blood VDRL and TPHA were performed.

Patients were sent to VCTC for screening HIV. Positive patients were registered in well health clinic and CD4count along with investigations for opportunistic infections were done. Blood was also collected for HBsAg and Anti HCV antibodies.

In cases of genital ulcers the following tests were done.

1. Dark Field examination for *Treponema pallidum*
2. Gram stained for *Haemophilus ducreyi* and *Candida*
3. Tissue smear and Leishman's stain for *Klebsiella granulomatis*
4. Tzanck test for giant multi nucleated epithelial cells.
5. Ziehl – Neelsen staining for *Mycobacterium tuberculosis*
6. Wet mount for amoebic infestations.

In case of genital discharge the following tests were done

- pH of the discharge
- Whiff test by adding 10%KOH (Potassium hydroxide) to the genital discharge.
- Wet film for *Trichomonas vaginalis* and clue cells.
- 10% KOH preparation for *Candida albicans* and culture with SDA (Saborauds Dextrose Agar) for suspective cases.
- Grams stain to identify *Neisseria gonorrhoea*, *Lactobacillus*, clue cells, *Candida hyphae*.

In addition to the routine examination of urine, culture of *Neisseria gonorrhoea* from urine specimen and endo cervix was done.

In case of genital growth, Histo-pathological examination of biopsy specimen was done for appropriate cases. Pus and discharge from ulcers were subjected to culture and sensitivity in needed cases.

Routine baseline laboratory analysis including complete blood count, urine for albumin, sugar deposits, ultra sound abdomen were done for all patients. Liver function test, Renal function test, Random blood sugar, chest x-ray, ECG, sputum smear for AFB, Mantoux test, blood and urine culture sensitivity, peripheral blood smear for Malaria were also done for the needed patients.

In needed symptomatic patients' opinion from concerned specialists such as Dermatology, Obstetrics & Gynecology, Dental, Ophthalmology, Chest clinic, Cardiology, Neurology, Nephrology, Urology and Gastroenterology were obtained. Patients were offered standard treatment according to clinical condition and prophylaxis for opportunistic infections.

## RESULTS

**Total number of FSWs in the study group = 440**

**Total number of FSWs diagnosed to have STI = 158[35.9%]**

**Table 1: Age distribution of FSWs in the study group (n=158)**

Age	Number	Percentage
16-19	38	24.05
20-29	76	48.10
30-39	32	20.25
40-49	9	5.69
More than 50	3	1.89

Majority of FSWs were in the age group of 20-29(48.10%). The youngest and oldest FSWs encountered in the study were 16 and 54 respectively.

**Table 2(a): Socio- Economic status of FSWs (n=158)**

Monthly Income (in rupees)	Total Number	Percentage
<1000	95	60.12%
1000 – 1999	43	27.21%
2000 – 4999	18	11.39%
>5000	2	1.26%

Majority of the FSWs belonged to lower socio-economic status (60.12%) i.e. less than Rs.1000 per month. This shows poverty was the main cause for sex trade.

**Table 2(b): Educational status among the FSWs (n=158)**

<b>Education</b>	<b>Total Number</b>	<b>Percentage</b>
Uneducated	14	8.86%
1 <sup>st</sup> to 5 <sup>th</sup>	72	45.5%
6 <sup>th</sup> to 10 <sup>th</sup>	53	33.54%
College	19	12.02%

Less than 9% of FSWs were uneducated in this study

**Table 3: Marital status (n=158)**

<b>Status</b>	<b>Number</b>	<b>Percentage</b>
Married	116	73.41
Single	42	26.58
Divorced/Separated	46	39.65
Widow	24	20.68

Majority of FSWs in the study were married (n=116, 73.41%).

Among the married FSWs 39.65% were divorced or living separately and 39.6% were living with their husbands.

**Table 4: Referral status of Female Sex Workers (n=158)**

<b>Referral</b>	<b>Number</b>	<b>Percentage</b>
Self	32	20.25
Other department	9	5.69
Non governmental organizations	50	31.64
Vigilance Home	67	42.40

Majority of the FSWs were brought from the vigilance home for screening (42.4%, n=67), followed by Non governmental organization (31.645%).

**Table 5: Presenting complaints of the FSWs (n=158)**

<b>Presenting Complaints</b>	<b>Number</b>	<b>Percentage</b>
Check up/ Screening	23	14.55
Genital discharge	72	45.56
Lower abdominal pain	24	15.18
Burning micturition	22	13.92
Genital ulcer (sore)	21	13.29
Dyspareunia	13	8.27
Skin rashes	9	5.69
Growth in genitalia	8	5.063
Loss of weight	4	2.51

Majority of the FSWs had visited the STD clinic for Genital discharge (45.55%). Lower abdominal pain (15.18%), burning micturition (14.55%), and Genital sore (13.29%) were the other common complaints. 14.55% of FSWs visited IOV for checking and screening for STIs. Some FSWs came here with symptoms of Dyspareunia (8.22%), Growth in genitalia (5.06%). 5.6% of FSWs were referred from skin department for Skin rashes.

**Table 6: Total number of clients visited the FSWs per week**

<b>Number of clients per week</b>	<b>Number</b>	<b>Percentage</b>
1-5	34	21.51
6-10	72	45.56
More than 10	52	32.29

Majority of FSWs met atleast 6-10 clients per week (45.56%).

Alarminglly 32.29% met more than 10 clients per week which increases the risk of acquiring STIs.

**Table 7: Number of CSWs who insisted their clients for condoms during sex (n=158)**

<b>Number of Partners who use condoms</b>	<b>Number</b>	<b>Percentage</b>
Never	33	20.88
Sometimes	97	61.39
Always	28	17.72

17.72% had condom use (all the time) with clients and 61.39% FSWs did not use condoms all the time. Alarminglly 20.88% FSWs had never used condom with clients.

**Table 8: Average duration of CSWs in sex trade**

<b>Average Duration</b>	<b>Number</b>	<b>Percentage</b>
6 months -1 year	21	13.29
1 – 2 years	32	20.25
2 – 5 years	64	40.50
More than 5 years	41	25.94

40.5% were in the sex trade for 2-5 years and 25.9% were in the sex for greater than 5 years duration.

**Table 9: Mode of sex (n=158)**

<b>Mode</b>	<b>Number</b>	<b>Percentage</b>
Peno vaginal	158	100
Peno oral	42	26.58
Peno anal	9	5.69

All the FSWs had peno vaginal as the primary mode of sex but 42 (26.58%) practiced peno oral route and 9 (5.692%) had peno anal route.

**Table 10(a): Past history of STDs**

<b>Past History of STDs</b>	<b>Number</b>	<b>Percentage</b>
Positive	98	62.02
Negative	60	37.97

**Table 10(b): Distribution of previous STDs**

<b>Disease</b>	<b>Number</b>	<b>Percentage</b>
Genital discharge	58	59.18
Genital ulcer	34	34.69
Genital wart	6	6.12

Out of 98 FSWs who had past history of STD, 58(59.18%) had vaginal discharge, (34.69%) had Genital sore and 6 persons had history of genital warts.

**Table 11: STD & HIV awareness**

<b>AWARENESS</b>	<b>Number</b>	<b>PERCENTAGE</b>
Positive	123	77.84
Negative	35	22.15

Majority of the FSWs had the awareness of AIDS and their preventive measures (77.84%).

**Table 12: Clinical signs in the Female Sex Workers**

<b>CLINICAL SIGNS</b>	<b>Number</b>	<b>PERCENTAGE</b>
Cervical hypertrophy	74	46.83
Soddening of vulva	47	29.74
Cervix healthy	40	25.31
Cervical erosions	34	21.51
Genital ulcer	17	10.75
Dermatophytes	17	10.75
Intertrigo	12	7.59
Genital wart	9	5.69
Oral Candidiasis	4	2.53
Molluscum contagiosum	2	1.26
Erythrasma	2	1.26
Skin rashes	2	1.26
Condyloma lata	1	0.63
Bartholin cyst	1	0.63
Scabies	1	0.63

Cervical hypertrophy was the most common clinical sign seen in 74 (46.83%) FSWs. Soddening of vulva was the next common sign present in 47(29.74%) FSWs, followed by Genital ulcers in 17(10.75%), Genital wart 9(5.69%). 40 FSWs had healthy cervix, 17(10.75%) of FSWs had T.cruris, 12 (7.5%) had itching groin. Molluscum contagiosum and Oral candidiasis was found among 2 and 4 FSWs respectively. Condyloma lata, Bartholin cyst and Scabies were found in 1 patient each.

**Table 13: Nature of Genital discharge among the study group (n=158)**

<b>Nature of Discharge</b>	<b>Total Number</b>	<b>Percentage</b>
Mucopurulent	84	53.16%
Mucoid	43	27.21%
Curdy White	19	12.02%
Frothy	12	7.59%

Majority of the women had mucopurulent vaginal discharge 84 (53.16%)

**Table 14: Results of investigation in the study group (n=158)**

<b>Investigations</b>	<b>Positive Result</b>	<b>Percentage</b>
Wet film for TV	54	34.17
Clue cell(Gram stain)	41	25.94
Culture of Candida spp.	34	21.5
KOH for Candida	28	17.72
Tzanck smear for Giant cells (Leishman's stain)	9	5.69
GC culture	6	3.79
Urine for culture & sensitivity	4	2.53
Gram stain for GC	3	1.89

Wet mount shows *Trichomonas vaginalis* in 54 patients (34.17%). Grams smear of the vaginal discharge shows clue cells in 41 (25.94%) FSWs and *Gonococcus* in 3 cases (1.89%). But GC culture of cervical swab shows 6 cases (3.79%) positivity, 34 (21.5%) FSWs were positive for culture of *Candida* smears and Tzanck smear shows Giant multinucleated epithelial cells in 9 patients (5.69%). Urine culture positivity in 4 patients (2.53%) and all of them grown *E.coli* sensitive to Amikacin.

**Table 15(a): VDRL reactivity among FSWs (n=158)**

<b>VDRL</b>	<b>Number</b>	<b>Percentage</b>
Reactive	20	12.65
Non-reactive	138	87.34

**Table 15(b): TPHA results among FSWs**

<b>TPHA</b>	<b>Number</b>	<b>Percentage</b>
Positive	20	12.65

Both VDRL and TPHA were reactive in 20 (12.65%) FSWs and Non-reactive in 138 (87.34%) patients.

**Table 16(a): Prevalence of HIV infection (n=158)**

<b>HIV Results (ELISA)</b>	<b>Number</b>	<b>Percentage</b>
Positive	13	8.22
Negative	145	91.77

HIV ELISA was positive in 13 (8.22%) patients and negative in 145 (91.77%) FSWs.

**Table 16(b): CD4 count among HIV Positive FSWs (n=13)**

<b>CD4 Count</b>	<b>Number</b>	<b>Percentage</b>
Less than 300	4	30.69
More than 300	9	69.23

Out of 13 HIV positive FSWs 4 had CD4 count less than 300 and 9 had CD4 count more than 300 cells.

**Table 17: Infections diagnosed by clinical examination and investigations in the study group.**

<b>Infections</b>	<b>Number</b>	<b>Percentage</b>
Trichomonas vaginalis	54	34.17
Bacterial vaginosis	41	25.94
Vulvo Vaginal candidiasis	34	21.51
Genital herpes	16	10.12
HIV	13	8.22
Ano Genital wart	9	5.69
Molluscum contagiosum	2	1.26
Secondary syphilis	1	0.63
Early latent syphilis	8	5.06
Late latent syphilis	11	6.96
Gonorrhoeae	6	3.79
Non gonococcal urethritis	4	2.53
Scabies	1	0.63
Hepatitis B	0	0
Hepatitis C	0	0

Distribution of infection among FSWs. Trichomonas vaginalis was the most common infection 34.17%, followed by Bacterial vaginosis 25.94%. 21.51% FSWs had Vulvovaginal candidiasis and 12.65% diagnosed to have Syphilis. 16 FSWs(10.126%) had Genital Herpes ,among them 10 had greater than 6 recurrences per year, 3 had less than 6 recurrences per year and 3 presented with Primary genital herpetic ulcer. Prevalence of Genital wart, HIV, Gonorrhoeae were 5.69%, 8.22%, 3.79% respectively. No patient was positive for the serological tests of Hepatitis B and C. Molluscum contagiosum was seen in 2 (1.26%) patients.

Out of 17 genital ulcers, 16 cases were diagnosed as genital herpes and one was non specific genital ulcer.

**Table 18: Distribution of infections among HIV positive FSWs**

<b>HIV Positive</b>	<b>Number</b>	<b>Percentage</b>
Herpes	9	69.2
Trichomonas vaginalis	6	46.15
Vulvo vaginal candidiasis	4	30.8
Oral candidiasis	4	30.8
Wart	3	23.0
Bacterial vaginosis	3	23.0
Molluscum contagiosum	1	7.7
Syphilis	1	7.7

Among 13 HIV positive FSWs examined and investigated 10 had multiple infections. Genital herpes (69.2%) was the commonest followed by TVV (46.15%) and Candidal infection (Oral, Vaginal) 30.8%.

**Table 19: Genital herpes in FSWs (n=16)**

<b>Number of recurrence</b>	<b>Number</b>	<b>Percentage</b>
Primary	3	18.75
More than 6 per year	3	18.75
Less than 6 per year	10	62.5

**Table 20: Concomitant infections in the study group of CSWs**

<b>CONCOMITANT INFECTIONS</b>	<b>NUMBER</b>
Syphilis + Trichomonas vaginalis	3
Syphilis + Bacterial vaginosis	2
Syphilis + Vulvo vaginal candidiasis	2
Trichomonas vaginalis + Vulvo vaginal candidiasis	12
Trichomonas vaginalis + Bacterial vaginosis	16
Trichomonas vaginalis + Bacterial vaginosis + Vulvo vaginal candidiasis	7
Vulvo vaginal candidiasis + Bacterial vaginosis	11
Syphilis + Wart	1
Herpes + Wart	3
Gonococci + Trichomonas vaginalis	3

Totally 60(37.97%) of FSWs had multiple STIs.

Trichomonas vaginalis, Bacterial vaginosis, Vulvo vaginal candidiasis were the common concomitant infections found in the study.

## DISCUSSION

During the study period, 440 FSWs were studied in detail, out of them 158 (35.9%) FSWs were diagnosed to have STIs with the aid of clinical examination and investigation. This was comparable with the study done in Manipur 2003 in which 32.68 were affected<sup>17</sup>.

The analysis of age in FSWs shows majority of FSWs were between 20-29 age (48.10%). This result correlates with Manipur study having 50.86%<sup>18</sup> in the 20 – 30 age group. Adolescent sex activity has increased which leads to more prone for STDs including HIV.

Majority of FSWs belonged to lower socio economic status. So poverty forced them to sex trade. 73.4% FSWs were married and among them 39.6% were living with their husbands which lead to increase spread of STIs in their partners. Majority of FSW s were referred by vigilance home and NGOs. 91.14%FSWs were able to read and write. This remains a positive factor in educating the patient about the risk of sexual behaviour, STI/HIV AIDS.

Genital discharge (45.56%) was the main complaint in this study. This was comparable with Kolkata study<sup>50</sup> 42.5%. Genital ulcer, growth in genitalia, burning micturition, lower abdominal pain were the other common symptoms noted in the study.

In this study 77.81% FSWs were heard about STDs and HIV and knew that STDs /HIV could be prevented by condom use. But only 17.72% had consistent condom use (all time) with the client. 32.29% of FSWs had contact with more than 10 clients per week and 45.56% FSWs had 5 to 9 clients per week, This was similar to David Gisslquist study done in India in 2006<sup>12</sup>. 40.50% FSWs were in sex trade for 2 – 5yrs duration.

The commonest mode of sex was normal peno vaginal 100%; peno oral was practiced by 26.58% and 5.69% practiced peno anal route. These results were comparable with Kolkata study<sup>50</sup>. 62% of FSWs had past history of STD, of which genital discharge was the commonest disease noted followed by ulcers and wart. In this study cervical hypertrophy, soddening of vulva, genital ulcers, genital wart and dermatophytes were the most important clinical signs noted. Oral candidiasis was present in 4 patients and all these 4 patients were HIV positive with CD4 count less than 300.

Mucopurulent discharge (53.16%) was the most common nature of vaginal discharge. Patients with *Trichomonas vaginalis* vaginitis and the bacterial vaginosis had predominantly mucopurulent discharge. Typical frothy discharge was seen in 1/5<sup>th</sup> of Trichomoniasis. More than 50% of Candidal patient had curdy white discharge. 25.94% patients had

clue cells. This was less compared to another study done among FSWs in 2005.<sup>21</sup>

12.65% FSWs had reactive VDRL and TPHA test. This was less compared to analysis done in Surat (22.9%)<sup>20</sup>. All the FSWs showed negative results with serological tests for Hepatitis B and Hepatitis C. 13 patients (8.2%) had positive HIV ELISA test. This result was very less when compared to the national and international studies<sup>17,18,19</sup>. Among the HIV patients 30% had CD4 count less than 300. In this study, genital Herpes was the commonest STD found in HIV positive patients with high recurrence rate. Vaginal discharge was the common complaint in the HIV positive patient. One patient had VDRL reactivity (1:16) among HIV positive FSW. Viral STDs were in the upper hand than bacterial or fungal STDs in the HIV infected FSWs. This result was comparable with the other studies.

The most common STD among FSWs in this study was *Trichomonas vaginalis* vaginitis (34.17%) followed by bacterial vaginosis and vulvo vaginal candidiasis with 25.94% and 21.51% respectively. Gonorrhoea culture was positive in 6 FSWs, out of which smear was positive only in 3 patients. On culture and sensitivity, all the 6 patients were resistant to penicillin and sensitive to Azithromycin and Ceftriaxone.

In this study distribution of viral STDs such as Genital Herpes, Genital wart and Molluscum contagiosum were 10.12%, 5.69% and 1.2% respectively. No patient had Hepatitis B or Hepatitis C.

In the highly emerging HIV pandemic, the most common mode of transmission in developing countries like India remains heterosexual only. Among the transmission of STDs in the community FSWs have the major role. Hence measures taking by reducing this group and providing awareness of STDs and HIV among FSWs and making them to adapt preventive aspects will markedly reduce the overall prevalence of STI/HIV among the community.

## CONCLUSION

1. Vaginal discharge was more common than genital ulcer disease. *Trichomonas vaginalis* vaginitis (34.17%) was the commonest STD among the FSWs followed by Bacterial vaginosis (25.94%) and Vulvo vaginal candidiasis (21.51%). Viral sexually transmitted infection are on the rise in the FSWs. 8.22% of the FSWs were HIV positive.
2. The FSWs belong to the lower socio economic status was 87.83%. 48.1% of FSWs belong to 20 – 29 years age group. 8.86% were uneducated.
3. FSWs using condom consistently with their clients was 17.72%. 61.39% of FSWs did not use condoms all the time with their clients. 20.88% of FSWs were never used condoms with their clients.
4. All the HIV infected FSWs were affected with sexually transmitted infections. Genital herpes was the commonest viral

infection among them and 76.9% had multiple STIs. 30.6% of the HIV positive persons had CD4 count less than 300.

5. Peno vaginal was the commonest mode of sex followed by peno oral (26.58%) and peno anal (5.69%).

Sexually transmitted disease management in FSWs requires the expert clinician to be conversant with risk assessment, the clinical presentation, and current diagnosis of certain infection to be familiar with new therapeutic agents. Successful STI care of FSWs can be achieved because of many infections are easily diagnosed and curable which paves way to reduce the HIV transmission in the community.

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**PROFORMA FOR STD PATTERN IN FEMALE SEX WORKERS  
ATTENDING INSTITUTE OF VENEROLOGY. CHENNAI**

**NAME:**

**AGE:**

**SEX:**

**OCCUPATION:**

**EDUCATION:** Uneducated/ Up to 5th / 12<sup>th</sup> / College

**SOCIO ECONOMIC STATUS:**<1000/1000-1999/2000-4999/>5000

**ADDRESS:-**

**MARITAL STATUS:-** Single/Married/Separated/Divorced.

**REFERRED BY:-**

**PRESENTING COMPLAINTS:-**

**GENERAL CHECKUP/SCREENING**

**GENITAL ULCER:-**

**Duration**  
**N/o**  
**Recurrence**  
**Painful**

**GENITAL DISCHARGE:**

**Duration**  
**Colour**  
**Foul smelling**  
**Consistency**  
**Amount.**

**ITCHING GENITALIA**

**SWELLING IN INGUINAL REGION**

**SKIN RASH**

**ORAL LESION**

**BURNING MICTURITION**

**JAUNDICE**

**LOWER ABDOMINAL PAIN**

**DYSPAREUNIA**

**TREATMENT HISTORY**

**Treatment taken for present complaints**

**EXPOSURE HISTORY**

**Recent exposure with Dates- MC  
PMC  
EMC  
LC**

**NO OF VISIT BY CLIENTS/WEEKS**

**USAGE OF CONDOM – ALWAYS/ SOME TIMES/ NEVER**

**ANY OTHER CONTRACEPTIVE METHODS**

**AMOUNT RECEIVED FROM CLIENTS**

**MODE OF SEX:- ORAL/ VAGINAL/ ANAL**

**HEALTH SEEKING BEHAVIOUR**

**NUNBER OF MONTHS/YEARS AS FSWs**

**AWARNNESS OF STDS AND TREATMENT:-**

**PASTHISTORY:-**

**TB, BA, HT, BA**

**STDs-**

**CONTACT HISTORY:**

**Partner Name & Card No:-**

**Occupation:**

**History and Investigation Details**

**MENSTRUAL HISTORY:-**

**CYCLES - Regular/Irregular  
LMP**

**OBSTETRIC HISTORY:**

**NO OF CHILDREN**

**NO OF ABORTION –**

**IF YES -> 1) Induced/ Spontaneous  
2) Duration of Gestation**

**CHILDREN:-**

**AGE/SEX**

**MODE OF DELIVERY FTND/ LSCS/FORCEPS**

**PUPERAL STERILISATION: DONE/NOT**

**ALCOHOL/SMOKING/ I.V. DRUG ABUSE**

