

Rapid Response to Syphilis Outbreak among Female Sex Workers

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Abstract

Background: Outbreak of syphilis, i.e., 16 cases of rapid plasma reagin (RPR) reactive cases of syphilis was reported in Community Based Organization (CBO) Sahyog of Surat, India, from April to August 2014. The aim of the study was to find risk factors and take immediate actions to prevent spread. **Materials and Methods:** Outbreak investigation of 16 Female Sex Workers of CBO Sahyog in Surat who were found Rapid Plasma Reagin (RPR) and Treponema Pallidum Hemagglutination Assay (TPHA) positive from April to August 2014; was carried out. Clinico-epidemiological and laboratory-based evidence for different sexually transmitted infections (STIs) conducted at Government Medical College, New Civil Hospital, Surat. Root cause analysis (RCA) of index case was carried out. **Results:** Desk review for the past 3 years data of STI revealed total STI cases as 88 (2011), 95 (2012), and 130 (2013), of which 4, 2, and 2 found RPR reactive, respectively. Data from April to August 2014 revealed 16 RPR reactive cases and confirmed by TPHA. On examination, one had ulcerative cervical lesion, rest did not have any symptoms of syphilis. Eleven had vaginal/cervical discharge, 11 had lower abdominal pain. A total of 11 had unprotected sex, 7 encountered condom tear in the past 6 months, and 5 reported sexual violence. Seven had sexual activity under influence of alcohol. Laboratory investigation revealed two as HIV-positive. RPR reactivity reported highest (9 out of 16) from same area of hotspot. RCA of probable index case revealed factors responsible as violence and nonuse of condoms. **Conclusions:** Outbreak investigation revealed one probable index case. All 16 treated with injection Penidure. Violence or condom tear is responsible for the spread. Crisis management team should be strengthened.

Keywords: Female sex workers, nonuse of condom, rapid plasma reagin reactive, violence, crisis

INTRODUCTION

About 498 million people aged between 15 and 49 years are infected with chlamydia, trichomoniasis, syphilis, and gonorrhea each year. Greater than or equal to 5 percent sex workers are infected with syphilis in 34 countries.^[1] In 2012, there were total 40,393 syphilis' cases in India.^[2]

Since 2000, Community Based Organization (CBO) Sahyog is implementing TI among female sex workers (FSWs). According to the National AIDS Control Organization (NACO) guidelines, in every 3 months, key population have to undergo routine medical checkups and every 6 months, they are tested for syphilis by screening test, rapid plasma reagin (RPR). If RPR test is reactive, the case is confirmed by *Treponema pallidum* hemagglutination assay (TPHA) and referred for treatment to New Civil Hospital, Surat (NCHS).

The objectives were:

1. To document the features of cases of syphilis among FSWs of Surat City, India
2. To identify the risk factors responsible for the spread of disease and prevent its further spread.

MATERIALS AND METHODS

The study was conducted during September 2014 at Surat city of Gujarat state. The inclusion criteria for the study were FSWs who were registered at Sahyog CBO and found RPR reactive between April and August 2014. The list of the cases was

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obtained by desk review of Sahyog data of RPR reactivity of the past 3 years and the cases found positive during the study period were included in this study. Semi-structured predesigned questionnaire was used to interview the patients in the presence of their peer educators. There was no loss to follow-up during the study. All the cases were provided appropriate treatment according to the NACO guidelines.

The main domains covered in the questionnaire were: sociodemographic profile, history of sexually transmitted infection (STI) and HIV/AIDS, current signs-symptoms, use of condom and other contraception, violence during activity, and occurrence of condom tear. The patients were accompanied to Departments of Obstetrics and Gynaecology (O and G) and Skin and Venereal Diseases of NCHS for clinical examination. Special onsite microscopy laboratory at O and G Department was established to avoid loss to follow-up for laboratory specimen collection and investigations with all aseptic precautions. Majority of the tests were done at Microbiology Department, NCHS; for polymerase chain reaction (PCR) for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* and fluorescent treponemal antibody absorption (FTA-ABS) test, samples were sent to Apex-Regional STD Teaching, Training and Research Centre at V.M Medical College and Safdarjung Hospital, New Delhi, in cold chain. Index case was identified, and in-depth interview for root cause analysis (RCA) of the probable index case was carried out by doctor trained in qualitative research. The quantitative data were analyzed by percentages and proportions. RCA was analyzed by generating appropriate codes and themes.

The interviews were conducted in separate room at PSM Department of NCH in the presence of their peer educator. Informed written consent for interview and its audio recording was obtained from each patient.

RESULTS

Mean age of the patients was 39 years (standard deviation \pm 10.95). Out of 16 patients, 10 (63.0%) were in this profession for more than 10 years, while 4 (25.0%) were for 6–9 years, and 2 (12.0%) for 2–5 years. The study revealed that 62.5% of all the patients were illiterate, 25.0% had attended primary school, and 12.5% had attended secondary school.

Out of 16 patients, 4 (25.0%) were unmarried, 5 (31.2%) were married but currently separated, 3 (18.7%) are currently married, 2 (12.5%) are divorced, 1 (6.2%) was widowed, and 1 (6.2%) is in live-in relationship. The study revealed that out of 16 patients, area of hotspot of 9 patients (56.2%) was Ring Road, stretching from railway station to Majura gate, 4 (25.2%) worked from home, one was from (6.2%) Khajuravadi, and one (6.2%) was from Kosad awas [Tables 1 and 2 and Figures 1 and 2].

DISCUSSION

Syphilis is an ancient disease but remains a major health challenge.^[3] The global prevalence rate of syphilis has again

Table 1: Clinical profile of the patients (n=16)

| | n (%) |
|--|---|
| Signs and symptoms | |
| Lower abdominal pain | 11 (68.7) |
| Vaginal discharge | 7 (43.7) |
| Burning micturition | 4 (25.0) |
| Painful intercourse | 4 (25.0) |
| Itching in genital area | 4 (25.0) |
| Cervical discharge | 9 (56.2) |
| Genital ulcer | 1 (6.2) |
| Past history of ulcer | 4 (25.0) |
| Oral ulcer | 2 (12.5) |
| Rash on trunk/palms/soles | 0 |
| Laboratory tests | |
| RPR test | 16 (100.0) |
| TPHA test | 12 (75.0) |
| FTA-ABS test | 7 (43.7) |
| Pap smear | 0 |
| Cervical smear (clue cells, bacterial vaginosis) | 4 (25.0) |
| KOH mount | 5 (31.2) (yeast cells seen) |
| Normal saline wet mount (trichomoniasis) | 0 |
| Fontana stain (spirochetes) | 0 |
| HIV antibody test (3 tests) | 2 (12.5) |
| Hepatitis B antibody test | 1 (6.2) |
| Hepatitis C antibody test | 0 |
| Gram stain (gonococcus) | 0 |
| Endocervical swab culture (bacterial) | 5 (31.2) (occasional Gram-negative bacilli and few polymorphs seen) |
| Endocervical swab culture (fungal) | 5 (31.2) (<i>Candida albicans</i>) |
| PCR for CTNG | 0 |

RPR: Rapid plasma regain, TPHA: *Treponema pallidum* hemagglutination assay, FTA-ABS: Fluorescent treponemal antibody absorption, KOH: Potassium hydroxide, PCR: Polymerase chain reaction, CTNG: *Chlamydia trachomatis* and *Neisseria gonorrhoeae*

Table 2: History of unprotected sexual activity, use of condom, and violence faced by the patients

| Variable | n (%) |
|--|-----------|
| Unprotected sexual activity in the past 6 months (reasons for unprotected sexual activity) | 11 (68.7) |
| Mutually decided with the partner/husband | 7 (63.6) |
| Alcohol | 2 (18.2) |
| Forceful activity by the client | 2 (18.2) |
| Condom tear (reason for condom tear) | 7 (43.7) |
| Negligent client | 6 (85.7) |
| Negligent husband | 1 (14.3) |
| Violence (reason for violence) | 5 (31.2) |
| Forceful group sex | 4 (80.0) |
| Forceful client | 1 (20.0) |
| Regular use of condom in the past 1 month | |
| With husband (n=3) | 1 (33.3) |
| With regular nonpaying client (n=10) | 5 (50.0) |
| With regular paying client (n=12) | 11 (91.6) |
| With occasional client (n=16) | 13 (81.2) |

surged because of multiple biological and social factors and it has imposed considerable health and economic burden.^[4-8] The syphilis outbreak was confirmed on the basis of desk review, and the present study focused on the factors which could have led to this outbreak. The study reported that nearly 63% of the patients were working in this profession since more than 10 years. Given that syphilis in clients of FSWs is not rare,^[9] it is suggested that FSWs with more clients and longer experience of selling sex would be more vulnerable to syphilis.

Majority of patients in the present study were illiterate or had primary school education which makes them vulnerable.^[10]

Majority (9 out of 16, 56%) of the patients were working from the area of hotspot that is Ring Road, Surat, so the same network of clients may have served as a bridge of infection among FSWs in such a short period.

Four patients had a history of painless ulcer, whereas others denied history of ulcer ever in their life. Majority (11 out of 16) had complaints of lower abdominal pain followed by (9 out of 16) cervical discharge. All the patients were suffering from latent syphilis as none had active ulcers or rashes on palms and soles or other symptoms of secondary syphilis.

The study reported that two patients had concurrent HIV infection. Prevalence of HIV/AIDS in FSWs in India is

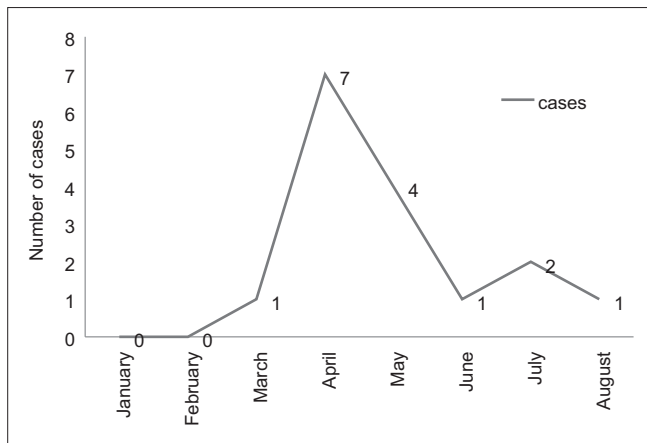


Figure 1: Epidemic curve depicting trend of syphilis in the year 2014 (rapid plasma reagin reactivity)

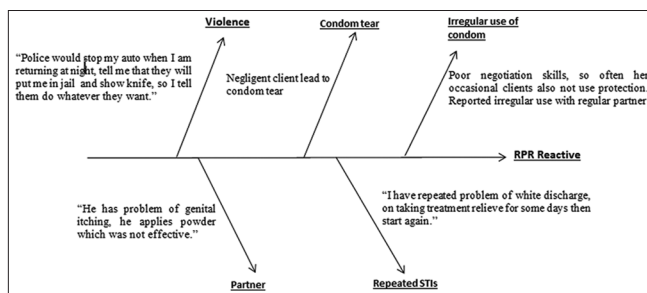


Figure 2: Root cause analysis using fishbone diagram showing various factors responsible for the index case

2.8%.^[11] The present study confirmed seven patients out of 16 by FTA-ABS to be positive for syphilis. The sensitivity of RPR, FTA-ABS, and TPHA for latent syphilis is 60%–70%, 95%–100%, and 95%–100%, respectively.^[12]

Inconsistent condom use with clients has been found in the majority of our patients. Totally, 11 out of 16 confirmed unprotected sex in the past 6 months. However, condoms remain a good strategy to reduce the risk of acquiring or transmitting STIs.^[12,13] Reasons were mainly client negligence or force. FSWs, encountering clients refusing to use condoms, have limited room for negotiation if they want to keep the client’s business.^[14] Furthermore, inconsistent use with regular partner and husband was observed. These sexual partnerships could then act as bridges between sex workers and the general population.^[15]

CONCLUSION

Outbreak investigation with high suspicion revealed one probable index case. Violence or condom tear was found responsible for the spread. All the cases were latent cases of syphilis. Out of 16 RPR reactive FSWs, 11 (68.7%) had unprotected sexual activity, 7 (43.7%) had reported condom tear, and 5 (31.2%) had reported violence majorly due to forceful group sex. Common associated STI found is candidiasis in 5 (31.2%) and bacterial vaginosis in 4 (25.0%). All 16 were treated with injection Penidure to reduce further spread.

The limitations of the study are that the findings reflect outbreak investigation only. Partner/client notification and treatment were difficult to obtain as the patient did not have any way to contact their casual clients. The strength of the study is very good rapport with Sahyog Mahila Mandal which is formed by PARAS-PSM Project that facilitated referral from field level to tertiary care level facility. Furthermore, the study is strengthened by substantial microbiological and venereological evidence which supports the information collected by the questionnaire and helps describe the outbreak.

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Conflicts of interest

There are no conflicts of interest.

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