Indian Journal of Obstetrics and Gynecology Research 6 (2019) 243–250

Content available at: iponlinejournal.com

Indian Journal of Obstetrics and Gynecology Research

Journal homepage: www.innovativepublication.com

Review Article

Prevention control and syndromic management of reproductive tract infections (RTIs) and sexually transmitted infections (STIs) in women

Ruby Bhatia[1,*]

[1] *Dept. of Obstetrics & Gynecology, MMIMSR Mullana, Ambala, Haryana, India*

ARTICLE INFO

Article history:
Received 12-03-2019
Accepted 05-06-2019
Available online 12-09-2019

Keywords:
Reproductive tract infections (RTIs)
HIV
Sexually transmitted infections (STIs)
Partner Management
Prevention

ABSTRACT

Reproductive tract infections (RTIs) and sexually transmitted infections (STIs) are key public health problem in India with significant effect on sexual and reproductive health. Globally in the age group of 15-49 years, 499 million episodes of remediable sexually transmitted infections occur yearly, of which 80% occur in developing countries and 79 million cases occur in India alone. There is remarkable decrease of bacterial sexually transmitted infections (gonorrhea and syphillis) with chancroid virtually on edge of disappearance. Viral sexually transmitted infections; genital warts, hepatitis B and herpes simplex have an rising trend. There is notable burden of lower reproductive tract infections; Candidiasis, trichomoniasis and Bacterial vaginosis among women with no evidence to indicate decrease in prevalence. In specific populations, STIs prevalence increases the risk of transmitting and ac quiring HIV infection by 2 to 3 times.
(RMNCH+A) and STI/RTI Control and Prevention Programme is useful in implementing a user friendly syndromic approach endorsed by WHO and NACO as an effective means to treat STI/RTI along with correct and consistent use of condom for every act of sex. Agenda for Sustainable Development Goal-3, 2030 aims at ending sexually transmitted infections epidemics as utmost health concerns with universal access to reproductive and sexual health for all.

1. Introduction

Reproductive tract infections (RTIs) and sexually transmitted infections (STIs) are key public health problem in India with significant effect on sexual and reproductive health. Any infection of the reproductive system is known as reproductive tract infection (RTIs). It includes sexually transmitted infections (STIs) as well as other infections of reproductive system that are not caused by sexual contact. Infections transmitted from person to person by sexual contract are known as STIs (sexually transmitted infections).[1] Sexually transmitted Diseases (STDs) also referred to as sexually transmitted infections and venereal diseases are illness that have significant probability of transmission between humans by means of sexual behaviour including oral sex, anal sex and vaginal intercourse, is also influenced by demographic and socio-economic profile of patient.[2] STIs and their complications are among the top five diseases categories for which adults seek health care. Globally around one third of sexually transmitted infections occur among people younger than 45 years of age, with 80% occurring in developing countries and in India alone 79 million cases occur.[3]

World health organization estimates 357 million new cases of four treatable sexually transmitted infections (Syphilis- 6 million, Neisseria gonorrhoea-78 million, Chlamydia trachomatis-131 million, Trichomonas vaginalis- 142 million) among 15-49 years age group people. Prevalence of viral sexually transmitted infections is also rising with 291 million cases of Human papilloma virus and 417 million Herpes simplex type 2 infection in women.[4]

WHO estimates that 400,000 new cases of sexually transmitted infections occur daily in the South East Asian

* *Corresponding author*.
E-mail address: drsunita.mor@gmail.com (R. Bhatia).

https://doi.org/10.18231/j.ijogr.2019.057
2394-2746/© 2019 Published by Innovative Publication.

Region (SEAR) alone South East Asian regions has 20% shares of global STI burden & 18% of global cost. 19 million new infections occur every year, almost 50% of them among people of 15 to 24 years age group.[5] 5% men and 11% women in age group of 15-49 years have STI/RTI related symptoms. Women are more vulnerable to STIs for socio-economic and biological reasons.[6] Compared to men, women have lower status, education, income and power. They find it difficult to obtain information about disease prevention and to seek and receive health care. Biologically also women are more vulnerable to STI/RTIs during sexual intercourse, as vaginal surface area is large, more unsafe to sexual secretions than the primary penis which is skin covered. The amount of male ejaculate, potentially infected, deposited in vagina during coitus is larger than vaginal and cervical secretions, potentially infected, to which male partner are exposed. More so, women infected with sexually transmitted infections are more likely to be either completely asymptomatic or minimally symptomatic compared to men. Hence there is urgent need to screen all asymptomatic pregnant women and contraceptive users for RTI/STI.

Out of more than 30 pathogens, eight known to be transmitted through sexual contact have been associated with higher incidence of illness. of these 8 infections, four are currently curable: trichomoniasis, gonorrhea, Chlamydia and syphilis (Bacterial stis). The other four are viral infections and are incurable but can be mitigated or modulated through treatment: hepatitis B, herpes simplex virus or herpes, HIV and HPV (Human Papilloma Virus) infection.[7]

There is remarkable decrease of bacterial sexually transmitted infections (gonorrhea and syphillis) with chancroid virtually on edge of disappearance. Viral sexually transmitted infections; genital warts, hepatitis B and herpes simplex have anrising trend. There is notable burden of lower reproductive tract infections; Candidiasis, trichomoniasis and Bacterial vaginosis among women with no evidence to indicate decrease in prevalence, thus affecting quality of reproductive health.[3] Bacterial vaginosis and trichomonal vaginalis increases acquisition and transmission of STI's.

STDs have been associated with spontaneous abortions, stillbirth, low birth weight, prematurity, preterm labour, premature rupture of membranes and endometritis in post - partum period. Long term sequel such as chronic pelvic pain, infertility, ectopic pregnancy, chronic hepatitis and cervical cancers are also observed in women with these infections in pregnancy.[8] The global strategy for prevention and control of STIs 2016-2021 aims priority action for ending STI epidemic as a public health concern.[9]

Major target for attainment of 2030 Agenda for Sustainable Development Goals is universal access to reproductive and sexual health for all. The strategy proposed on STIs remains one of the three health sector strategies for 2016-2021. It aims at ending STI epidemics as key health concerns with 90% reduction in incidence of treponema pallidum globally, 90% reduction in incidence of Neisseria Gonorrhoea (2018 global baseline) and to sustain 90% nationwide coverage and at least 80% coverage in every district in countries with Human papilloma virus vaccine in their National Immunization Programme.[9] In specific population, STIs prevalence increases the risk of transmitting and acquiring HIV infection by 2 to 3 times.[3]

STIs are biological cofactors and markers for high risk behavior for HIV infection.[5] Thus, strict measures for STI Control can be a strong strategy to reduce HIV transmission. Reproductive Maternal, Neonatal, Child Health and Adolescent Programme (RMNCH+A) and STI/RTI Control and Prevention Programme, is useful in implementing effective User friendly syndromic management of RTI/STIs for general population with focus on pregnant / non-pregnant women, children, Adolescents and High risk behavior groups at primary, secondary and tertiary care levels through network units and rural hospitals.[3] Service providers are trained to address STI/RTI among high risk groups. A user friendly syndromic approach endorsed by WHO and National AIDS Control Organization (NACO) as an effective means to treat symptomatic STI/RTI is available at every health care facility.[3] When laboratory tests also supplement, it is called Enhanced Syndromic Approach.

Detailed history, sexual history, risk assessment, local examination including per speculum/bimanual pelvic examination and laboratory investigations with audiovisual privacy, confidentiality and non-judgmental attitude is performed after informed consent in all women presenting with discharge per vaginum/pain lower abdomen/genital ulcer disease in gynaeout-patient department.Tables 1, 2, 3 and 4 Clinical spectrum of RTI/STI is noted for accurate diagnosis with provision of Enhanced syndromic management and partner treatment Table 5. Male condom use prevents HIV transmission by 80-95%. It is one of most important means of preventing STIs. CDC has incorporated condom as an essentials component in public health strategies to prevent STIs.[10] Provision of condom & counseling for correct & consistent use of condom with every act of sex remains cornerstone of syndromic management.

Vaccination are available for prevention of several infections that are sexually transmitted or associated with sexual activity. Quadrivalent or 9-valent HPV vaccine offers protection against HPV 18 and 16 as well as type 11 and 16 which causes genital warts. HPV vaccine is available for all females in age group of 9 to 26 years.

Table 1: History taking

1.	Abnormal vaginal/ uretheral / Anal discharge (amount, odour, colour).
2.	Abnormal growth / mass over Genitalia.
3.	Vulvul itching, genital rash, sores, ulcer, excoriation, fissures.
4.	Frequency of micturition, dysuria.
5.	Pain lower abdomen, backache, dysmenorrhoea.
6.	Dyspareunia.
7.	AUB, Polymenorrhoea, menorrhagia, Post-coirtal bleeding.
8.	History of Sore throat / pharangitis
9.	History of Oral Sex / Anal Sex.

Table 2: High risk assessment

1.	High Risk Group : Male and female sex workers (M/FSW), Men having sex with men (MSM), Transsexuals and Transgenders (TS/TG) and people who inject drugs (PWID), Victims of sexual violence.
2.	Occupation : Sex worker / bar girl / truck driver.
3.	Migration – Prolonged stay away from home.
4.	Poor genital hygiene / Poor menstrual hygiene.
5.	Unprotected sexual encounter / multiple sexual partner / recent change in sexual partner / partner with STI.
6.	Similar complaints in past.
7.	History of Abortion / MTP
8.	Use of alcohol / drugs during sex.
9.	Sexually active adolescent girl.
10.	High risk sexual activity ; oral / anal sex.
11.	Among sex workers : Increased frequency in change of partner.
12.	Occasional / Correct and Consistent use of condom, with regular partners / clients / both.
13.	Douching / use of vaginal drying agents.
14.	Any history of transfusible, transmissible infection (HIV, HCV, HBsAg, VDRL) in patient or partner.

Table 3: Local examination in female patient

1.	External examination of lower abdomen and genitalia after informed consent for any rash, excoriation, ulcer, fissure in good light with complete audio visual privacy.
2.	Palpation of inguinal region for swelling and pain in lymph nodes.
3.	Per speculum examination: Vagina/cervix for discharge / ulcer.
4.	If per speculum examination not possible in women with discharge pervaginum, Treat both for vaginal and cervical discharge.
5.	A bimanual pelvic examination for any evidence of acute / chronic pelvic inflammatory disease.

Table 4: Laboratory investigations in RTI/STI

1.	Vaginal PH - normal 4 (3.8-6) $>$ 4.5 – BV / Trichmoniasis
2.	Wet mount of vaginal discharge$>$10 WBC's = Gonococcal/ Chalmydial Cevicitis Motile trichomonads +ve Clues cellsYeast cells
3.	10% KOH test Positive Whiff Test (fishy odour) – BV / Trichomoniasis Candida Spores/Pseudohypha/ Hyphae/ Yeast cells
4.	Gram stain of Vaginal discharge for WBC $>$10 WBC's = Gonococcal/ Chlamydial Cervicitis Clue cells in bacterial vaginosis Nugent Score-0-3 - Normal, 4-6 - Intermediate, 7-10- Treat Gram stain of endocervical smear to detect gonococci/WBC
5.	Pap Smear
6.	Refer to ICTC Voluntary Counselling and testing for HIV RPR for Syphilis in all ANC Women and RTI STI patients Repeat RPR for Syphilis in High risk ANC women in 3 trimester RPR Reactive $>$ 1:8 confirm with TPHA/ FTA ABS Treat all RPR reactive ANC women
7.	NAAT for Trichomonal Vaginalis N.GonorrheaChlamydia tracomatis
8.	Cultures – Vaginal/Cervical Swab Trichomonas N. Gonorrhae Chlamydia Trachomatis Candida Albicans
9.	Tzanck Smear – Multnucleated giant cells in HSV

Table 5: Clinicalspectrum & syndromic management of RTI/STI

Sr.	Type of RTI / STI OPD Prevalence		Causative organism	Clinical Features	Management (CDC 2015)	Syndromic /Partner Management / Followup RTI STI National guidelines 2014
1.	Vaginal Discharge (a) Trichomonal Vaginitis	45%	• Tricolomonas • Vaginalis (Anerobic Protozoa)	• Yellowish Greenish Frotty Foul Swelling discharge, Local Pruritis, Dysura, frequency micturition. • Angry Red vagina, strawberry homeorrhoagic spots.	• Metronidazole 2g orally single dose or • Tinidazole 2g orally single dose or • Metronidazole 500mg oally BD for 7days • Metronidazole gel NOT recommended	Kit 2 (Green) Tab Fluoconazole 150 mg + Secnidazole 2G • Tab Fluconazile contraindicated during pregnancy. • Rule-out H/o Immunosuppressants / corticosteroid and diabetes/prolonged antibiotic vaginal douching mellitus. • Rx Partner in last 30 days. • Abstinance during Rx. • Correct and consistent use of condom. • Follow up after 7 days. • Retesting by NAAT after 3 months • Pregnancy with Tichomoniasis - Single dose 2 Metronidazole drug of choice at any stage of pregnancy • Routine Screening and testing for T.Vaginalis is recommended at 1st visit/ 3months/ annually in pregnancy with HIV • Bacterial Vaginosis and Candidiasis do not need partner Rx.
	Persistent/ Recurrent Trichomoniasis Metronidazole/Tinidazole susceptibility Test				• Avoid Single Dose Metronidazole • Metronidazole 500mg BD for 7days fails • Metronidazole 2g/ Tinidazole 2g orally OD for 7days for many wks • Tinidazole 2-3g daily for 14days PLUS Intravaginal Tinidazole locally	
	(b) Candidiasis		• Candida Albicans	• Thick curdy white flaky discharge.		
	(c) Bacterial Vaginosis		• Provetella sp • Mobiluncus sp • Gardellella Vaginalis, • Mycoplasma hominis, • Ureplasma • Fastidiou	• Thin greyish white, non-viscous, discharge adherent to vaginal wall without itching.		
	(d) Mixed					

Continued on next page

Table 5 continued

	(a) Cervical Discharge	5%	• Neisservice Gonorrhoal	• Mucopurullent cervical discharge	**Kit 1 (Grey)**
2.	Persistent & Recurrent Cervical Discharge		• Chlamydia Trachomatis • Trichomonas Vaginalis • Herpes Simplex Virus • Mycoplasma Genitallian	• Post coital bleeding • Erythematsas cervix, Bleeds on touch • Endo cervical bleed.	• Tab Azithromycin 1 G + Cefixime 400 mg • Rx. all partners in last 60 days for urethral discharge. • Abstinance during Rx. • Follow-up after 7 days.
	(b) Urethral Discharge Persistent Urethral discharge	10%		• Mucopurullent Urethral discharge	Kit1 + Tab Doxycycline 12 hourly. ×7 Days Add Tab Secnedazole 2G
	(c) Anorectal Discharge	2%		High risk sexual behaviour Oral Sex/ Anal Sex /Pharyngitis Mucopurullent Anal Discharge	Kit 1

Continued on next page

Table 5 continued

3.	Genital Ulcer Non-Herpetic Syphilatic Ulcer	15%	Troponema Pallidum VDRL positive in $>$ 1:8 dilutions. Confirmed by positive TPHA (Treponema Pallidum haemagglutination Test)	Discharging ulcer on genitalia (Vulva, Vagina, Cervix)	**Kit 3 White** • Inj Benzathine Pencillin 2.4 million U I/M after testing does + Tab Azithromycin 1 G. Or Tab Erythromycin 500 mg 6 hrly $\times$ 7 days Or Tab Ciprofloxacin 500 mg 12 wkly. $\times$ 3 days • Allergic to Pencillin Cap Doxycycline 100 mg 12 hrly. $\times$ 15 days Or Tab Azithromycin 2 G • Pregnant patient – Inj. Benzallnia Pencilin – 2.4 million U I/M Or Tab Erythromycin 500 mg 6 hrly $\times$ 15 days • Erythromycin Estalate contraindicated in pregnancy. • Do not use Tab Azithromycin in men having sex with men (MSM) • Partner Rx with same regimen. • Abstinance during Rx • Rx neonate also Follow up 3/6/12/24 months.
4.	Genital Ulcer (Non Herpetic) Chancroid	0.1%	• Gram Negative Haemophyllis Ducceryi	Ulcer Over Genital area	**Kit 4 Blue** • Cap. Doxycycline 100mg 12 hrly. $\times$ 15 days + Tab Azithromycin 1gm • Partner Px with same regimen
5.	Genital Herpetic Ulcer Non syphilitic/Non chancroid Recurrent Herpes	15%	Herpes Simplex Virus • Tzank smear positive for multinucleated giant cells	• Multiple Genital Painful vescicles / erosions / ulcers over genital area	**Kit-5 (Red)** Tab Acyclovir 400 mg 8 holy $\times$ 7 day No partner Rx unless active lesions in partner • Suppressive therapy with Tab Acyclovir 12 hrly for one year if more than 6 recurrences in a year. • Pregnant women with genital herpetic lesion at onset of labour – cesarean delivery recommended.

Continued on next page

Table 5 continued

6.	Lower Abdominal Pain (LAP) / Pelvic Inflammatory Disease	6%	• Polymicrobial aerobes / anaerobes • Neiseria Gonorrhoea • Chlamydia trachomatis • Mycoplasma • Tubercle bacilli • Escrechia Coli • Viruses	• Constant lower abdominal pain • Low backache • Dyspareunia • Congestive Dysmenorrhoea • Polymenorrhoea • Menorrhagia • Tensesmus / Fever • Fixed Retroverted tender uterus / with without adenaxal masses.	**Kit 6 (Yellow)** • Tab Cefixime 400 mg stat + Metronidazole 400 mg 12 hrly. & Cap Doxycycline 100 mg 12 hrly for 2 weeks • Rx all partners in last 60 days with kit-1 for urethral discharge. • Partner symptomatic refer to STI clinic • Abstinance during treatment • Follow up day 3, 7 and 14.
7.	Granuloma Inguinale Inguinal Bubos (IB)	2%	Intracellular Gram negative bacetrium. Klebsiella granulomatis	Painful Tender, Swelling in inguinal region	**Kit T (Black)** • Tab Doxycyline 100 mg 12 hrly. × 21 days + Tab Azithromycin 1 gm.
8.	Human Papilloma Virus Infection (HPV) • Genital Warts		Human Papilloma virus type 6 & 11 More in HIV positive patients	Single / multiple Soft painless, pink cauliflower growth around anus vulvovaginal area, urethra, perineum, Diagnosis confirmed by Biopsy	• 20 Podophyllin in Tincture Benzoin • Wash off after 3 hours. • Protect surrounding area with vaseline. • Rpt. Weekly till lesions resolve completely. Or • Imiquimed 5% cream at bed time three times / week for 12-16 weeks. • Podoflox
9.	Others • Molluscum Contagiiosum • Pediculosis Rebis • Scabies		Pox Virus Pthirus Pubis Sarcoptes Scabie		

1.1. Partner notification

Reach Sex Partners and offer them Treatment, Patient referral, Provider referral, Patient provider referral, Couples Approach

*1.2. **Partner management***

Timely partner management prevents reinfection, transmission from infected partners and helps in detection of asymptomatic individuals who do not seek treatment. Symptomatic partners to be referred to STI clinic for management. Advise sexual abstinence during course of treatment. Counseling for safe sex with correct and consistent use of condom for all types of intercourse as it reduces transmission of HIV infection to 0–0.2%. Counsel about mutually faithful relationship between two uninfected partners only. Health care providers must practice demonstration and return demonstration of condom use to every RTI/STI client. Condom must be available in adequate quantity in all health care facilities.

2. Conclusion

Safe sex, Correct & consistent condom promotion for Triple (HIV, Syphilis, Hepatitis B) protection and User Friendly Syndrome specific partner management in reproductive age esp. adolescence and high risk group is the need of the millennium as STIs fecilitate HIV transmission. Adequate control and/or elimination of sexually transmitted infections will contribute in reducing disease and Human suffering. All Pregnant women should be screened for STIs at first prenatal visit. Eliminate Mother-to-child transmission of syphilis and HIV Zero new infections, zero sexually transmitted infection-related complication and deaths with free and easy access to prevention and treatment services for sexually transmission infections.

3. Source of funding

None.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Sharma VK, Khandpur S. Epidemiology of sexually transmitted disease In. In: SV, editor. Sexually Transmitted Diseases and Aids ; 2003,. p. 11–13.
2. National Strategic Plan for HIV/AIDS and STI-NACO, available online at last accessed on 30-04-2019 ;. Available from: http://naco.gov.in/sites/default/files/Paving%20the%20Way%20for%20an%20AIDS%2015122017.pdf.
3. National guidelines on Prevention Management and Control of Reproductive Tract Infections and Sexually Transmitted Infections 2014. Ministry of Health and Family Welfare, Government of India. Available online at, last accessed on 14 March 2019. ;. Available from: http://naco.gov.in/sites/default/files/National_Guidelines_on_PMC_of_RTI_Including_STI%201.pdf.
4. Newman L, Rowley J, Hoorn SV. Global Estimates of the prevalence and incidence of four curable sexually transmitted infections in 2012, based on systematic Review and Globally reporting. *PLOSONE*. 2012;10:143304–143304.
5. Velu PP, Gravett CA, Roberts TK. Epidemiology and aetiology of maternal bacterial and viral infections in low and middle income countries. *J Glob Health*. 2011;1:171–88.
6. National Family Health Survey (NFHS-3) 2005, Ministry of Health & Family Welfare Government of India, National Report. Available online at last accessed on 30 April 2019 ;. Available from: http://rchiips.org/NFHS/NFHS-3%20Data/VOL-1/Summary%20of%20Findings%20(6868K).pdf.
7. Sexually transmitted infections (STIs) Available at last accessed on 30 April 2019. ;. Available from: https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-(stis).
8. Ekanem EI, Ekott M, Udo AE, Efiok EE. Inyang Out Fi. Prevalence of Sexually transmitted diseases in pregnant women in Ikot Ekpene, a rural community in Akwa Iborn State,N Nigeria. *Open J Obstet Gynecol*. 2012;2:1–7.
9. Global Health Sector Strategy on Sexually Transmitted Infections 2016-2021 towards ending STIs WHO 2016 Geneva Switzerland. Available online at.Last accessed on 14 March 2019. ;. Available from: https://www.who.int/reproductivehealth/publications/rtis/ghss-stis/en/.
10. CDC guidelines for prevention and treatment STIs 2015.;Available from: https://www.cdc.gov/mmwr/pdf/rr/rr6403.pdf.

Author biography

Ruby Bhatia Prfoessor

Cite this article: Bhatia R. Prevention control and syndromic management of reproductive tract infections (RTIs) and sexually transmitted infections (STIs) in women. *Indian J Obstet Gynecol Res* 2019;6(3):243-250.