

## Aetiology & risk factors of recurrent vaginitis & its association with various contraceptive methods

Jyoti Thulkar, Alka Kriplani, Nutan Agarwal & Sreenivas Vishnubhatla\*

*Departments of Obstetrics & Gynecology & \*Biostatistics, All India Institute of Medical Sciences  
New Delhi, India*

Received June 20, 2008

**Background & objectives:** Women who do not seek treatment for recurrent vaginitis have risk to acquire other sexually transmitted infections. Besides proper antibiotic treatment, male condom acts as a barrier to various infections. Present study was done to assess type of vaginitis, its association with various contraceptive methods and need of male condom in prevention of recurrent vaginitis.

**Methods:** Prospective hospital based cohort study with a total of 400 women with recurrent vaginitis was done. Wet mount and Gram's staining examination were done to diagnose type of vaginitis. After treatment, proper counselling about good hygiene and use of male condom for 4 months in addition to their contraceptive method was advised. Patients were called after four months or when they developed symptoms of vaginitis.

**Results:** Tubal ligation (38.8%) and non contraceptives (34.0%) were the most common methods used by recurrent vaginitis patients. Bacterial vaginosis (BV, 53.8%) and mixed infection (36.8%) were commonly seen infections. BV was not observed in OC pill users. Overall post-treatment cure was 89.1 per cent.

**Interpretation & conclusions:** Our findings showed that male condom use provided protection against recurrent vaginitis and its use should be promoted with other contraceptive methods in high risk cases. Female condom may be another option.

**Key words** Contraceptive trends - male condom - recurrent vaginitis

Recurrent vaginitis is defined as three and more episode of vaginitis per annum<sup>1</sup>. Common causes of recurrent vaginitis are infectious and non infectious which include hormonal and allergic. Along with infective organism common factors responsible for recurrent vaginitis are unhygienic practices, improper care during menstruation, multiple sexual partners and contraceptive trends. Commonly observed vaginal infections are bacterial vaginosis (BV), Trichomoniasis and Candidiasis. These should be treated properly

to reduce the risk of acquisition of other sexually transmitted infections (STIs)<sup>2</sup>. The annual incidence of sexually transmitted diseases (STDs) in India is estimated as 5 per cent or approximately 40 million new infections occur every year<sup>3,4</sup>. Prevalence of vaginal discharge in India is 30 per cent and in Delhi it is 29.9 per cent<sup>5</sup>. Barrier method of contraception, usually male condom, acts as a preventive measure in sexually transmitted diseases and as well contraception<sup>6</sup>. In general, the contraception is used to prevent pregnancy

and for spacing the child. Tubal sterilization is the most common method of contraception in India<sup>7</sup>. In India, no study has correlated type of contraception and type of vaginitis. In recurrent vaginitis knowing contraceptive method is important in prevention of recurrence. Prevention is always better than repeated treatments, hence this study is important. This prospective cohort study was undertaken to assess aetiology of vaginitis, its association with various contraceptives methods and need of barrier contraceptive to prevent recurrent vaginitis.

### Material & Methods

The prospective hospital-based cohort study was done over the period of one year from March 2007 to February 2008 at All India Institute of Medical Sciences (AIIMS), New Delhi. Ethical clearance was obtained from institute's Ethic Committee. Consecutive 400 women with recurrent vaginitis between age groups of 18- 45 yr attending outpatients of Obstetrics and Gynaecology Department were included in this study after informed consent. Unmarried, pregnant and menopausal women were excluded. Information about routine hygienic practices, proper care during menstruation, number of sexual partners and contraceptive history was collected. All women were properly counselled about good hygiene and menstrual care so that these factors could not act as risk factor in relapse. Wet mount and Gram's staining examination were done to diagnose type of vaginitis. Wet mount was prepared by directly taking discharge on 2 slides and adding one drop of saline on one slide and one drop of 10 per cent KOH on another slide and observing under microscope. Bacterial vaginosis was diagnosed by Amsel's criteria<sup>8</sup>. Candidiasis was diagnosed when budding yeast like structures were observed on KOH mount or Gram's staining. Trichomoniasis was diagnosed when flagellated, moving and pear shaped organisms were found on saline mount. Mixed vaginitis was diagnosed when more than one organism were present. The women were treated according to NACO guidelines only once and no further medications were given<sup>9</sup>. After treatment, use of male condom was advised for 4 months in addition to their current contraceptive method. Patients were called every month for four months or when they developed symptoms of vaginitis. At every visit wet mount and Gram's staining examination were done. Complete cure was labelled when no organism was found and recurrence was labelled when there was presence of organisms.

Statistical analysis of data was done by software Stata 9.1 (Texas, USA). Association of type of vaginitis and contraceptive method was calculated by Chi-square test. Pre and post-treatment difference was calculated by Mc-Nemar's test for symmetry.

### Results

The mean age of women was 27.48±6.31 yr. Of the 400 women, 28 (7%) were uneducated, 81 (20%) had education up to primary school, 211 (53%) up to secondary school, 65 (16%) up to graduation and 15 (4%) up to post graduation. Eight per cent (32) women had monthly income below Rs. 5000, 205 (55%) had between 5000 -10000, 121 (30%) between Rs.10000-20000, and 42 (10%) had income more than Rs. 20000.

Only 366 out of 400 women (91.5%) were followed up regularly. Detailed analysis of these women revealed unhygienic practices in 10 women (2.73%) and improper menstrual care in 23 women (6.28%). None had more than one sexual partner.

Tubal ligation 155 (38.8%), followed by non contraceptives 136 (34%) were the most common methods used by recurrent vaginitis cases. Male condom users were found in 88 (22%) cases and others (copper-T users and combined OC pill users) in 21 (5.2%). None were using injectables contraceptives and none had vasectomy, done (Table I). Wet mount and Gram's staining examination revealed that bacterial vaginosis (BV) was the most common (215, 53.8%) type of vaginitis, followed by mixed vaginitis (147, 36.8%). Candidiasis was observed in 22 (6.2%) and Trichomoniasis in 13 (3.2%) (Table I).

In tubal ligation cases bacterial vaginosis (BV) was the most common (70.3%) vaginitis, followed by mixed infection (26.5%). Non contraceptive users had bacterial vaginosis in 46.3 per cent and mixed infection in 42.7 per cent, condom users showed different trends; mixed infection was the most common (48.9%) vaginitis, followed by bacterial vaginosis (42%). Others category (copper-T and combined OC pill user) showed candidiasis as most common (33.3%) infection and bacterial vaginosis in 28.6 per cent. Association of type of vaginitis with different contraceptive use was statistically significant ( $P < 0.001$ ) (Table I).

Post- treatment overall cure was 89.1 per cent. A total of 95 per cent cases of bacterial vaginosis were cured. In cases of candidiasis, 68.2 per cent showed cure (Table II). Difference in cure found after the treatment was statistically significant ( $P < 0.001$ ).

In women who had tubal ligation done overall cure was 89.6 per cent with recurrence of 10.4 per cent; 91.0 per cent of BV cases cured. Candidiasis showed 50 per cent cure with 50 per cent developed into mixed infection. Trichomoniasis cases had 100 per cent cure (Table III). Post-treatment difference was statistically significant ( $P < 0.001$ ).

In the group of patients using no contraception, after using male condom for four months, there was cure of 95.2 per cent in overall. Bacterial vaginosis cases had

98.2 per cent cure. Candidiasis and trichomoniasis had 88.9 and 100 per cent cure respectively. Mixed infection was cured in 92.4 per cent (Table IV). The difference in cure between pre- and post-treatment was significant ( $P < 0.001$ ).

Women with spouses using condoms had 80.8 per cent cures with 19.2 per cent relapse (Table V). Bacterial vaginosis showed 100 per cent improvement. Candidiasis and trichomoniasis had 50 and 100 per cent cures respectively. Mixed infection

**Table I.** Contraceptive methods used and type of vaginitis in subjects (n=400)

Contraceptive method	Bacterial vaginosis	Candidiasis	Trichomoniasis	Mixed infection	Total
None	63 (46.3)	9 (6.6)	6 (4.4)	58 (42.6)	136 (34.0)
Tubal ligation	109 (70.3)	2 (1.3)	3 (1.9)	41 (26.4)	155 (38.8)
Condom	37 (42.0)	7 (7.9)	1 (1.1)	43 (48.9)	88 (22.0)
Other(copper Tand OC pills)	6 (28.6)	7 (33.3)	3 (14.3)	5 (23.8)	21 (5.2)
Total	215 (53.8)	22 (6.2)	13 (3.2)	147 (36.8)	400 (100.0)

Values in parentheses are percentages

**Table II.** Pre- and post-treatment vaginitis status in women

Initial	Post-treatment					Total
	Nil	Bacterial vaginosis	Candidiasis	Trichomoniasis	Mixed	
Nil						0
Bacterial Vaginosis	189 (95.0)	9 (4.5)	1 (0.5)	0	0	199 (100.0)
Candidiasis	15 (68.2)	0	6 (27.3)	0	1 (4.5)	22 (100.0)
Trichomoniasis	13 (100.0)	0	0	0	0	13 (100.0)
Mixed infection	109 (82.6)	9 (6.8)	4 (3.0)	0	10 (7.6)	132 (100.0)
Total	326 (89.1)	18 (4.9)	11 (3.0)	0	11 (3.0)	366 (100.0)

Values in parentheses are percentages

**Table III.** Type of vaginitis in tubal ligation method

Type of vaginitis	Pre-treatment	Post-treatment				
	Total	Nil	Bacterial vaginosis	Candidiasis	Trichomoniasis	Mixed infection
Nil	0	0	0	0	0	0
Bacterial vaginosis	101	92 (91)	8 (8)	1 (1)	0	0
Candidiasis	2	1 (50)	0	0	0	1 (50)
Trichomoniasis	3	3 (100)	0	0	0	0
Mixed infection	38	33 (86.8)	2 (5.3)	1 (2.6)	0	2 (5.3)
Total	144	129 (89.6)	10 (6.9)	2 (1.4)	0	3 (2.1)

Values in parentheses are percentages

**Table IV.** Type of vaginitis in non contraceptives users

Type of vaginitis	Pre-treatment	Post-treatment				
	Total	Nil	Bacterial vaginosis	Candidiasis	Trichomoniasis	Mixed infection
Nil	0	0	0	0	0	0
Bacterial vaginosis	58	57 (98.3)	1 (1.7)	0	0	0
Candidiasis	9	8 (88.9)	0	1 (11.1)	0	0
Trichomoniasis	6	6 (100)	0	0	0	0
Mixed infection	53	49 (92.4)	3 (5.7)	0	0	1 (1.9)
Total	126	120 (95.2)	4 (3.2)	1 (0.8)	0	1 (0.8)

Values in parentheses are percentages

**Table V.** Type of vaginitis in condom users

Pre-treatment		Post-treatment				
Type of vaginitis	Total	Nil	Bacterial vaginosis	Candidiasis	Trichomoniasis	Mixed infection
Nil	0	0	0	0	0	0
Bacterial vaginosis	35	35 (100)	0	0	0	0
Candidiasis	6	3 (50)	0	3 (50)	0	0
Trichomoniasis	1	1 (100)	0	0	0	0
Mixed infection	36	24 (66.7)	4 (11.1)	3 (8.3)	0	5 (13.9)
Total	78	63 (80.8)	4 (5.1)	6 (7.7)	0	5 (6.4)

Values in parentheses are percentages

had unsatisfactory cure (66.7%) with relapse of mixed infection in 13.9 per cent. Post-treatment cure in recurrent vaginitis was significant ( $P < 0.001$ ).

Analysis of copper T users showed 83.3 per cent cure. Bacterial vaginosis, candidiasis and trichomoniasis all showed 100 per cent cure. Mixed vaginitis showed relapse in 50 per cent. Significant cure was found in post treatment period ( $P < 0.05$ ).

Combined OC pill users had lower cure (66.7%) as compare to other methods. BV was not observed in pre-treatment as well as post-treatment group. Trichomoniasis and mixed infection had 100 per cent cures and candidiasis had 50 per cent cures. Post-treatment difference in cure was not significant. As sample size was small, definite conclusion could not be made.

### Discussion

Risk factors for recurrent vaginitis are lack of proper health awareness and lack of proper hygiene<sup>10</sup>. In the present study unhygienic practices were found in a small proportion of patients.

In this study, more number of women with tubal ligation had vaginitis followed by no contraceptive users and condom users. This finding suggests that barrier contraception has some role in preventing recurrent vaginitis. Smart *et al*<sup>11</sup> has shown that consistent use of condom can reduce recurrence of bacterial vaginosis. Bacterial vaginosis was the most common type of vaginitis in this study similar to a previous study among women in Delhi<sup>2</sup>. Combined OC pills users showed protective effect for BV. According to an earlier study by Shoubnikova *et al*<sup>12</sup> OC and condom usage exert a protective effect against BV. Candidiasis was common in OC pills users and other contraceptive users had less than 10 per cent prevalence. Various studies support this finding<sup>13,14</sup>.

Overall post-treatment analysis showed an overall cure in about 90 per cent women with vaginitis. Keith *et al*<sup>15</sup> reported that protective effect of condoms has been recognized since the era of Casanova, but it is difficult to quantify. Women with BV showed higher cure compared to others which indicates that male condom is useful in preventing recurrent BV. Same finding is reported earlier also<sup>11,12</sup>. Cases with trichomoniasis had 100 per cent cure post-treatment which is shown earlier also and trials were conducted using female condom<sup>16</sup>.

Once women are sterilized, they stop use of condom and are prone to various sexually transmitted diseases<sup>17</sup>. Hence use of condom should be promoted in recurrent vaginitis cases even if they are sterilized.

Women with non contraceptive use in past showed >95 per cent cure with condom use. These women were younger than ligated women and sexually more active. Use of condom should be promoted in such women to control recurrent vaginitis.

Group using male condom as method of contraception also showed recurrent vaginitis in this study. Unhygienic factors may be possible explanation for this category. Counselling about good hygiene and proper menstrual care may help in prevention of recurrent vaginitis in this group. In India, National AIDS Control Programme was launched in 1987, and started promoting condom for prevention of AIDS and STDs<sup>18</sup>. But still condom use is more for prevention of pregnancy rather than prevention of STDs and recurrent vaginitis.

Limitation of this study was sample size in combined OC pills and copper T users was very low and further studies are required to come to any conclusion. Female condom is the only device other than the male condom that has been shown to prevent HIV transmission and is under women's control<sup>19</sup>. With unwilling male, female condom is the better option to choose.

In conclusion, our findings indicate that barrier method of contraception offers protection from recurrent vaginitis. Condom use should be combined with hygienic practices to reduce relapse. Bacterial vaginosis and mixed infection were found to be the common type associated with recurrent vaginitis. Usage of male condom should be promoted and combined with other contraceptive methods for prevention of recurrent vaginitis.

### References

1. Maruotti T, Reverberi L, Figliolini M, Pacchiarotti U, Alessandro A, Di Rosa R. Recurrent vaginitis. *Ann Ig* 1989; *1* : 1465-78.
2. Bhalla P, Chawla R, Garg S, Singh MM, Raina U, Bhalla R, *et al*. Prevalence of bacterial vaginosis among women in Delhi, India. *Indian J Med Res* 2007; *125* : 167-72.
3. Luthra UK, Mehta S, Bhargava NC, Ramachandran P, Murthy NS, Sehgal A. Reproductive tract infections in India: The need for comprehensive reproductive health policy and programs. In: Germain A, Holmes KK, Piot P, Wasserheit JN, editor. *Reproductive tract infections*. New York: Plenum Press; 2003. p. 317-42.
4. Chopra SK. Reproductive tract infections in India: A sociological overview. *Proceedings of international workshop on reproductive tract infections* 1995; Kunming, China, 13-17, B 33-40.
5. *National Family Health Survey 2: 1998-99, (NFHS II)*. Mumbai: International Institute for Population Sciences. 1999. p. 307-14.
6. Donovan B. Barrier to conception and disease. *Ann Acad Med Singapore* 1995; *24* : 608-14.
7. Government of India. *Annual report 2003-2004*, New Delhi: Ministry of Health and Family Welfare, 2004. Available from: [www.mohfw.nic.in](http://www.mohfw.nic.in).
8. Sha BE, Chen HY, Wang QJ, Zariffard MR, Cohen MH, Spear GT. *et al*. Utility of Amsel criteria, Nugent's score and quantitative PCR for *Gardnerella vaginalis*, *Mycoplasma hominis* and *Lactobacillus* spp. for diagnosis of bacterial vaginosis in human immunodeficiency virus-infected women. *J Clin Microbiol* 2005; *43* : 4607-12.
9. Government of India, Ministry of Health and Family Welfare. *Simplified RTI and STI treatment guidelines*. New Delhi: National AIDS Control Organization; 1999.
10. Chen HB, Zhou LY, Li HQ, Liu HQ, Ding SQ, Zhao M. Prevalence of bacterial vaginosis in married women of reproductive age in the rural area of Shandong province and its risk factors. *Zhongguo Yi Xue Yuan Xue Bao* 2006; *28* : 378-81.
11. Smart S, Single A, Mindel A. Social and sexual risk factors for bacterial vaginosis. *Sex Transm Infect* 2004; *80* : 58-62.
12. Shoubnikova M, Hellberg D, Nilsson S, Mardh PA. Contraceptive use in women with bacterial vaginosis. *Contraception* 1997; *55* : 355-8.
13. Maccato ML, Kaufman RH. Fungal vulvovaginitis. *Curr Opin Obstet Gynecol* 1991; *3* : 849-52.
14. Sobel JD. Pathogenesis of *Candida* vulvovaginitis. *Curr Top Med Mycol* 1989; *3* : 86-108.
15. Keith L, Berger GS, Brown ER. Contraception and pelvic infection in women. *Contracept Fertil Sex* (Paris) 1986; *14* : 49-58.
16. Soper DE, Shoupe D, Shangold GA, Shangold MM, Gutmann J, Mercer L, *et al*. Prevention of vaginal trichomoniasis by compliant use of the female condom. *Sex Transm Dis* 1993; *20* : 137-9.
17. Sangi-Haghpeykar H, Poindexter AN 3<sup>rd</sup>. Planned condom use among women undergoing tubal sterilization. *Sex Transm Dis* 1998; *25* : 335-41.
18. Government of India, *Combating HIV/AIDS in India 2000-2001*, New Delhi: NACO, Ministry of Health and Family Welfare; 2002.
19. Deniaud F. Current status of the female condom in Africa. *Sante* 1997; *7* : 405-15.

Reprint requests: Dr Jyoti Thulkar, E-89 Ansari Nagar (East), New Delhi 110 029, India  
e-mail: [jthulkar@hotmail.com](mailto:jthulkar@hotmail.com)