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Clinical Spectrum and Microbial Etiology of Reproductive Tract Infections in Rural Women in the Hills of North India

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Summary

The present project was undertaken in village setup to assess the prevalence and microbiological etiology and outcome of syndromic treatment of reproductive tract infections among women in two areas of the Garhwal region of the Himalayas. A total of 1577 rural women were surveyed through a questionnaire, of whom 596 had symptoms of R.T.I. One thirty nine women were seen at the camps. The commonest symptoms reported were vaginal discharge (85.6%), lower abdominal pain (60.4%) and urinary symptoms (49.6%). Most frequent clinical lesions observed were cervical erosion (27.3%), vaginitis (25.2%), endocervicitis (19.4%), hypertrophied Cervix (18%), thickened and tender adnexa (15.1% & 18%) and fixed retroversion (16.5%).

The commonest microbiological disorder found was bacterial vaginosis (44.6%), followed by Chlamydial Cervicitis and P.I.D. (38.2% & 36%), vaginal candidiasis (9.3%) and trichomoniasis (7.9%). Inflammatory PAP smear was seen in 81.4% patients. 64.7% patients were treated on syndromic basis, out of whom 47.7% patients had complete relief of all symptoms. In 25.2% patients, there was a change in diagnosis and treatment as a result of laboratory findings. Eighteen patients (13%) had other co-existing gynaecological diseases like uterine prolapse (5.76%), ovarian mass (2.88%) fibroid uterus (0.72%), DUB (2.88%), post menopausal bleeding (1.44%) and vesico vaginal fistula (0.72%).

It was observed that the microbial spectrum of R.T.I. including S.T.D.s was different in this region. Therefore, in the initial stages of starting work on R.T.I. in a geographic area, detailed laboratory investigations are required. Once the pattern of diseases is known, the syndromic approach can be used widely, as the laboratory investigations are costly, time consuming and not easily available at remote places.

Introduction

Reproductive tract infections (RTIs) including sexually transmitted diseases are world wide in their distribution and affect mainly the young. They may progress in the individual leading to serious complications and cause a high degree of morbidity during the sexually active period of life. In India, statistics pertaining to RTIs are meager. The present prospective, community based survey was undertaken to assess the incidence, symptomatology and microbial aetiology of reproductive tract infections among rural women in the Garhwal region of the Himalayas. The study also provided an excellent opportunity to assess the outcome of treatment of RTIs based on detailed laboratory investigations.

Material and Methods

The present study was carried out involving the departments of Obstetrics & Gynaecology and Microbiology and the Rural Development Institute of the Himalayan Institute Hospital Trust. A total of 139 patients were examined and investigated for various reproductive tract infections in two of our project areas that are about 30km apart and about 100km away from

our medical college in the mountains of Garhwal.

A questionnaire in Hindi on genito-urinary symptoms was distributed among 1577 rural women above the age of 15 years with 965 women in Project Area 1 and 612 in Project Area 2 had one or more of these symptoms and were called by personal letters to special health camps called "Adult Clinics". One hundred and nineteen women in Project Area 1 and 110 women in Project Area 2 presented themselves on the day of the camps. However because of the time taken to examine and investigate each woman properly, many women left and a total of 43 patients were investigated in Project Area 1 and 96 patients in Project Area 2.

On the days of the special clinics, a detailed history of all the patients was taken including history of present illness, obstetric history, menstrual history, contraceptive history and personal history. A brief general examination was followed by a thorough gynaecological examination. In addition, the following samples were taken for laboratory investigations. For logistic reasons not every kind of sample could be taken from each woman despite our best efforts.

1. Vaginal exudate for
   a) Saline mount for Trichomonas vaginalis.
   b) Acridine orange stained smear (pH 6.0) for T. vaginalis.
   c) Gram stained smear for yeast cells and for scoring for bacterial vaginosis.
   d) pH estimation.
2. PAP smear
3. Endocervical sample taken on two viscose tipped swabs for
   a) Culture on Thayer-Martin medium for Neisseria gonorrhoeae
   b) Gram-stained smear for pus cells (as evidence of cervicitis) & intracellular gram negative diplococci.
   c) Direct fluorescent antibody (DFA) staining for Chlamydia trachomatis.
4. Mid-stream urine sample for
   a) Microscopy
   b) Bacterial culture
5. 5 ml venous blood for
   a) Non-specific and specific serological tests (RPR and TPHA respectively) for syphilis.
   b) ELISA for C.trachomatis specific IgG as evidence of deep infections e.g. salpingitis or lymphogranuloma venereum (LGV).
6. In the presence of genital ulcers, the following additional samples were taken:
   a) Viscose tipped swab for Haemophilus ducreyi isolation on Enriched GC Apgar.
   b) DFA test for Herpes simplex virus.
   c) Giemsa stained crush smear of punch biopsy from ulcer edge for calymmatobacterium granulomatis.
   d) Ulcer exudates for Dark-ground microscopy for Treponema pallidum.

Tests 1a, 1c, 1e, 4a and 6d were performed at the camps. For other tests, samples were taken at the camps and processed in the medical college laboratory. All cultures were plated immediately after collection and transported at temperatures between 30°C and 36°C. (Maximum transit time 8 hours). Cultures for H.ducreyi on enriched GC Agar were incubated, after transport, at 33°C. Other cultures were incubated at 36°C.

ELISA for HIV antibodies was not done because of lack of counseling facilities and inability to maintain confidentiality in small villages.

Treatment was given on the basis of provisional clinical diagnosis according to standard STD treatment recommendations laid down by the national AIDS Control Organization (NACO), Government of India. After the laboratory results were available, treatment was modified accordingly. All the patients were followed up for clinical improvement and outcome was recorded one month after the date of the camps.

Observation

Out of a total of 139 women who were investigated, 82 (59%) were found to have at least one reproductive tract infection. [For analysis, women with no other positive finding but inflammatory cervical smears on Pap staining have been considered to harbour an infection. Cervical dysplasia has not been counted as an infection although the majority of dysplasia is caused by infection with Human Papilloma Viruses].

The commonest affected age group was 26-35 years (36%), followed by women in the 36-45 years age group (27.3%) and 15-25 years age group (15%).

The symptomatology varied widely (Table I). The commonest symptoms, which the patients complained of were vaginal discharge (85%), lower abdominal pain (60.4%), vaginal pruritus (43.9%) and urinary symptoms like dysuria and frequency (49.6%).

On clinical examination, cervical erosion was the commonest lesion affecting 27.3% of the women examined. The other clinical lesions that were observed were vaginitis (25.2%), thickened and tender adenexae (15.1% and 18% respectively), endocervicitis (19.4%),

Table 1: Frequency of women with RTI suggestive symptoms

Symptoms	Project area I	Project area II	Total
Lower abdominal pain	37/43 (86%)	47/96 (49%)	84/139 (60.4%)
Vaginal discharge	40/43 (93%)	79/96 (82.3%)	119/139 (85.6%)
Menstrual abnormalities	26/43 (60.5%)	35/96 (36.4%)	61/139 (43.9%)
Urinary symptoms	29/43 (67.4%)	40/96 (41.7%)	69/139 (49.6%)
Dyspareunia	11/43 (25.6%)	10/96 (10.4%)	21/139 (15.1%)
Vaginal pruritis	32/43 (74.4%)	29/96 (30.2%)	61/139 (43.9%)
Backache	40/43 (93%)	43/96 (44.8%)	83/139 (59.9%)
Infertility	3/43 (07%)	6/96 (06.2%)	9/139 (06.5%)
Recurrent abortions	3/43 (07%)	5/96 (05.2%)	8/139 (05.7%)

Table II – Types of Clinical Lesions

Clinical lesions	Project area I	Project area II	Total
Vulvitis	3 (7%)	1 (1%)	4 (2.9%)
Urethritis	1 (2.3%)	0 (0%)	1 (0.7%)
Vaginitis	13 (30.2%)	22 (23%)	35 (25.2%)
Genital Ulcer	0 (0%)	3 (3.1%)	3 (2.1%)
Cervical erosion	16 (37.2%)	22 (23%)	38 (27.3%)
Hypertrophied Cervix	5 (11.6%)	20 (20.9%)	25 (18%)
Endocervicitis	11 (25.6%)	16 (16.7%)	27 (19.4%)
Adnexal mass	2 (4.6%)	3 (3.1%)	5 (3.6%)
Thickened Adenexa	13 (30.2%)	8 (8.3%)	21 (15.1%)
Adnexal Tenderrness	6 (14%)	19 (19.8%)	25 (18%)
Fixed retroversion	6 (14%)	17 (17.7%)	23 (16.5%)
Venereal wart	0 (0%)	1 (1%)	1 (0.7%)

Table III – Microbiological spectrum of R.T.I.

Disorder	Area I (43 patients)	Area II (96 patients)	Total
Bacterial vaginosis	16 (36%)	46 (47.9%)	62 (44.6%)
Trichomoniasis	4 (9%)	7 (7%)	11 (7.9%)
Vaginal candidiasis	4 (9%)	9 (9%)	13 (9.3%)
Senile vaginitis	0 (0%)	1 (1%)	1 (0.7%)
Vaginitis of unknown origin	2 (5%)	8 (8%)	10 (7.2%)
Gonococcal cervicitis	0 (0%)	0 (0%)	0 (0%)
Chlamydial cervicitis	Not done	13/34 (38.2%)*	
Cervicitis of unknown origin	3 (7%)	18 (19%)	21 (15.1%)
Chlamydial P.I.D.**	Not done	9/25 (36%)*	
U.T.I.	1 (2%)	1 (1%)	2 (1.4%)
Syphilis	0 (0%)	1 (1%)	1 (0.7%)
Cervical dysplasia •	0/42 (0%)	3/66 (4.5%)	3/108 (2.8%)
Inflammatory PAP smear	35/42 (83%)	53/66 (80%)	88/108 (81.4%)

* Data for Chlamydial cervicitis and PID have not been summated since C.trachomatis antigen and antibody were tested for, only in the second camp and ever there, for budgetary constraints tests were done in women who had signs and symptoms suggestive of endocervicitis and/or PID

** Evidenced by elevated C.trachomatis IgG titrea (>=1:64) in the absence of genital ulcer or inguinal lymphadenopathy.

• Percentage of cervical dysplasia denotes number of positive smears out of all the smears that were taken.

hypertrophied cervix (18%) and fixed retroversion (16.5%) (Table II).

Table III shows the microbial spectrum of the various reproductive tract infections that were revealed through laboratory investigations. Bacterial vaginosis was the commonest infective disorder, affecting 44.6% of all the women examined. Chlamydia trachomatis antigen and antibody were detected in 38.2% and 36.0% of samples respectively. Out of the 34 endocervical samples tested for Chlamydia antigen, 18 had microscopic evidence of cervicitis and out of these 18 cases, 11 were positive for chlamydial antigen. This brings the chlamydial positivity rate among microscopically documented cases of cervicitis to 11/18 (61.1%). Two more samples were positive for Chlamydia trachomatis antigen but had no microscopic evidence of cervicitis. Vaginal candidiasis and trichomoniasis were found in 9.3% and 7.9% of women respectively. Serological evidence of latent or previously treated syphilis was found in one woman only, as evidenced by RPR non-reactivity and TPHA reactivity. Gonorrhoea was conspicuous by its absence although it was looked for by culture as well as microscopy of gram stained endocervical smears. One woman was clinically found to have genital warts. Three patients had genital ulcers but the microbial aetiology could not be ascertained in any of them.

A specific follow up questionnaire was designed to ascertain response to treatment. As shown in table IV, out of a total number of 90 patients, who were initially treated syndromically, 43 patients (47.7%) were completely relieved of their symptoms. A significant number of patients (25.2% of all patients) underwent a change in diagnosis and treatment following laboratory investigations all of whom, on repeat follow-up, were found to have been relieved of their symptoms. All the patients with microbiologically documented disease had complete relief. The commonest symptoms, which were not relieved and for which at times no infectious pathology could be demonstrated were vaginal discharge, backache and pain in the lower abdomen.

Besides reproductive tract infections, eighteen patients (13%) had other co-existing gynaecological diseases like uterine prolapse (5.76%), Ovarian mass (2.88%) fibroid uterus (0.72%), DUB (2.88%), post menopausal bleeding (1.44%) and vesico vaginal fistula (0.72%).

Discussion

Various microbial agents are responsible for female reproductive tract infections, which are associated with considerable morbidity and mortality. In a study from Bangladesh, 22% women had symptoms of RTI out of whom 68% had clinical or laboratory evidence of infection (Wasserheit et al 1989). Kumar and Aggarwal (1998) reported a point prevalence of 61% of women having symptoms associated with reproductive morbidity. In our project, 32% women had symptoms of RTI, out of whom 59% had laboratory evidence of infection. In the present study the commonest age-group affected was 26-35 years (36%) which was slightly high as compared to the study of Ganguly et al (1983) and Mohanty et al (1995) (25 years and 25.5 years respectively). It has been observed that there has been a change in the spectrum of microbial agents responsible for RTIs including STDs (Khan et al 1991; Williams et al 1991; Ghosh et al 1994; Agarwal et al 1999). In our study, bacterial vaginosis was the commonest infective disorder, affecting 44.6% of all women tested, followed by vaginal candidiasis (9.3%) and trichomoniasis (7.9%). There was no case of primary syphilis, which is consistent with the study of Agarwal et al (1999). Gonorrhea was surprisingly not found in any of our patients. No conclusion can be drawn about the prevalence of chlamydial infection from our study since we looked for it only among highrisk women. However, in this select group of women, who had clinical features of cervicitis and/or PID, C. trachomatis antigen was found in 38.2% of samples tested. Out of the 34 endocervical samples tested for chlamydial antigen, 18 had microscopic evidence of cervicitis and out of these 18 cases, 11 were positive for chlamydial antigen. This brings the chlamydial positivity rate among microscopically documented cases of cervicitis to 11/18

Table IV – Summary of follow up statistics

Categories	Area I	Area II	Total
Treated medically on syndromic basis	36/43 (83.7%)	54/96 (56.2%)	90/139 (64.7%)
Follow up done	31/36 (86.1%)	54/54 (100%)	84/90 (93.3%)
Total relief of all symptoms	14/36 (38.9%)	29/54 (53.7%)	43/90 (47.7%)
Treatment started or changed as a result of lab investigations	9/43 (20.9%)	26/96 (27.1%)	35/139 (25.2%)
Had surgical pathology or Menstrual abnormalities	7/43 (5.04%)	11/96 (7.92%)	18/139 (13%)

(61.1%). The remaining 16 endocervical samples tested for Chlamydia trachomatis antigen had no microscopic evidence of cervicitis and out of these only two were antigen positive (12.5%). The relative risk of developing cervicitis among women with Chlamydia trachomatis infection was therefore 61.1/12.5 or 4.9. There are recent data to suggest that C. trachomatis can be spread by non-sexual routes as well with disturbing implications for the control of this important pathogen (Singh 1999). It is also intriguing that none of the primary pathogens (N. gonorrhoeae and C. trachomatis) was found in 38.9% of our microscopically documented cervicitis cases.

Two or more infections were simultaneously present in 25.9% of women but no particular combination was numerically predominant. Multiple organisms in the same patient have been reported earlier in many studies (Joshi et al 1991, Bandi et al 1998, Agarwal et al 1999). Trichomoniasis was found in association with cervical dysplasia in one patient only. Misra et al (1998) has reported that trichomoniasis was found in association with premalignant changes in the cervix in 13.5% cases. Joshi et al (1991) had also found significant association between CIN II & III and S.T.D.

As far as treatment of R.T.I. is concerned, treating on the basis of syndrome approach was ineffective in about half of the cases. Moreover indiscriminate treatment may have adverse effects. Candida albicans infection of the vaginal ecosystem has a deleterious effect on the members of the normal microflora. Clotrimazole, although effective against C. albicans infection, also has a deleterious effect on components of the normal vaginal microflora. One of the implications for women using Clotrimazole for microbiologically undocumented vaginal yeast infection is an increased risk of infection or disease through the disruption of the protective microflora barrier (Ross et al 1995). In our project, we found that 10 (7.2%) patients who were clinically found to have R.T.I., did not harbour any of the organisms on laboratory investigations and were unnecessarily treated, based on clinical findings.

Detailed laboratory investigations are, therefore needed when starting work in a geographic area to find out the prevalent R.T.I. and S.T.D. Once the pattern is known, the syndromic approach may be tailored to the local needs and used widely, as the laboratory investigations are expensive and may not be always available everywhere especially in remote places. However, women who do not respond to syndromic therapy and those who have had sexual contact outside the project area should be investigated completely and then treated on the basis of laboratory findings.

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References

1. Agarwal S, Agarwal BM, Rizvi U, Ansari K, Singh S: J. Obst. Gyn. India 48; 68, 1999.
2. Bandi S, Shridhar J, Dave A: J. Obst. Gyn. India 48; 48, 1998.
3. Ganguly DD, Sundharan JA, Bhargava NC, Dey MM, Ravis, Sharma VK. Dermatol. Venereol. & deprd. 1983.
4. Ghosh SK, Ganguly U, Banerjee S, Neogi BK, Roy AK: Ind Journal Dermatol. 39: 65, 1994.
5. Joshi J, Mali B, Hazari K, Chitlange S, Shah R: J. Obst. Gyn. India 41; 521, 1991.
6. Khan SM, Rao S, Singh N: Ind. J. Med. Microbiol. 9: 68, 1991.
7. Kumar R, Aggarwal AK. J. Obst. Gyn. India. 48, No. 4; 68, 1998.
8. Misra JS, Dao K, Chandrawati, J. Obst. Gyn. India; 48; 58, 1998.
9. Mohanty J, Das KB, Mishra: Ind J. Dermatol Venereol. 61: 143, 1995.
10. Ross RA, Lee M, Londerdonk AB. Obstet Gynecol. 86, No. 6, 925, 1995.
11. Singh S. Ind J Med Microbiol 17, No. 3, 142, 1999.
12. Wasserheit JN, Harris JR, Chakraborty J, Kay BA, Mason KJ. Studies in Family Planning 20: 69; 1989.
13. Williams J, Premalatha M, Damodharan K, Shanmuga SA: The Indian J. Sex. Trans. Dis. 12: 18-1991.