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RESEARCH ARTICLE

THE BURDEN AND DETERMINANTS OF REPRODUCTIVE TRACT INFECTIONS IN WOMEN ATTENDING OBSTETRICS AND GYNAECOLOGY OPD FROM A TERTIARY TEACHING CARE CENTRE IN NORTH INDIA: REQUIRES AWARENESS AMONG PUBLIC

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ABSTRACT

Introduction: Reproductive Tract Infections (STI/RTI) are a common public health problem. RTIs often cause discomfort and lost economic productivity.
Aims: to ascertain the bacterial, fungal and parasitic causes of RTI in women attending Obstetrics and Gynaecology OPD, to co-relate the causes of RTI with various epidemiological and clinical parameters, to co-relate the occurrence of RTI with infertility.
Results: Out of 93 samples 62 showed growth and 31 were sterile. Out of 62 positive samples 35 were Candida species (28 pure species and 7 grown with others) and 27 were as follows- Gardnerella vaginalis (4), Trichomonas vaginalis (8), Trchomonas vaginalis with others (enterobacteriaceae family) (4) and mixed bacterial growth (11). NoNeisseria gonorrhoeae was isolated. Out of Candida isolate, Candida albicans was the most common one (80%). RTI was most prevalent in 21-30 years age group women having poor hygiene. Most women were multiparous and having complain of curdy discharge.
Conclusion: Most female patients were unaware of or ignorant about vaginal discharge and pain lower abdomen that will lead to PID. Proper education, moral support and examination of vaginal discharge irrespective of their
ignorant complain will definitely lower the morbidity of female RTI.

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INTRODUCTION

Reproductive Tract Infections (STI/RTI) are a common public health problem in developing countries, contributing to a huge economic burden among individuals and health systems (WHO STI, 2013). According to the World Health Organization (WHO), each year around 499 million cases of curable STIs occur throughout the world in the age group of 15-49 years, of which 80% cases occur in developing countries and about 79 million cases occur in India annually (Aggarwal *et al.,* 2011). Another study suggests that about 40 million cases of RTIs occur in India each year (IIPS 2007). National Family Health Survey (NFHS-3) reported that 11% women and 5% men in the 15-49 years age group had STI/ RTIs related symptom in the past year (Piot *et al.,* 1992). RTIs often cause discomfort and lost economic productivity (Over *et al.,* 1996).

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The most serious long-term sequelae arise in women: pelvic inflammatory disease (PID), cervical cancer, infertility, spontaneous abortion and ectopic pregnancy, the latter of which may lead to maternal death. Treatment of these infections and prevention of their sequelae are complicated by the fact that 30–50% of women with infections (up to 70–75% in the case of chlamydia), and a smaller but significant proportion of men, are asymptomatic (Cates *et al.,* 1990, WHO 2001). Among women, RTIs often goes undiagnosed and untreated. Adolescents too are vulnerable to RTIs due to their ignorance of risk factors, inadequate accessibility to services and social stigma associated with these diseases. A number of studies have been initiated to cover the epidemiological, clinical and diagnostic dimensions of RTIs. The poor health of Indian women is a concern on both national and individual level. It affects the next generation of citizen and workers. It reduces productivity, not only at the house hold level but also in the informal and formal economic sectors. Improving women's health is integral to social and economic sectors.

Women are not only more susceptible than men to these infections but also are more prone to develop complications, in part because infection in women is difficult to diagnose and is therefore more likely to go untreated (Srivastava *et al.,* 2004).

Aims and objective

1. To ascertain the bacterial, fungal and parasitic causes of RTI in women attending Obstetrics and Gynaecology OPD.
2. To co-relate the causes of RTI with various epidemiological and clinical parameters.
3. To co-relate the occurrence of RTI with number of child birth (parity) in the reproductive life.

MATERIALS AND METHODS

The present study was conducted between JANUARY 2010 to APRIL 2011.A total number of 186 samples of high vaginal swabs and cervical swabs were collected from 93 patients attending Gynaecology & Obstetrics OPD of KMCH, Katihar, Bihar. After selection of cases, a brief clinical history regarding occupation, personal hygiene, menstrual cycles was noted down. Obstetric history and history of any antibiotic usage either systemically or locally was also elicited from these patients.

Inclusion criteria

1. Complain of vaginal discharge, lower abdomen, lower back since 3 months.
2. Age between 18-50 years.

Exclusion criteria

1. Antibiotic treatment history.
2. Vaginal tablet input history.

Collection of samples

For collection of high vaginal swabs, sterile cotton swabs were inserted into the upper part of the vagina and rotated to collect any discharge before withdrawing it taking adequate precautions not to touch the lower vaginal walls. Two swabs were collected from each patient; one swab was used for microscopy and the other for culture. The swabs were sent to the laboratory for processing immediately.

Cervical swabs were collected under speculum examination. The cervical os was visualised in good light, the cervical mucus was removed and a sterile cotton swab was inserted into the cervix. The swab was rotated to collect as much secretions as possible. Two such swabs were collected and immediately sent to the laboratory for microscopy and culture. Swabs collected were immediately transported to the laboratory and hence no transport medium was used.

Preliminary tests

1. **Measurement of vaginal discharge ph:** The ph of vaginal secretion was done by ph indicator paper and the colour was matched by comparing it with the colour given on the ph paper strip.
2. **Whiff test:** For performance of whiff test, the vaginal secretion was mixed with 10% KOH, if "fishy smell" came out from the discharge; it showed that whiff test was positive.

Direct microscopic examination

Direct microscopic examination of a wet mount preparation of the swabs were prepared and immediately examined under 10x and 40x objective to look for *Trichomonas,* clue cells and yeast like organisms. After making the wet preparation the swabs were used to make smears on clean glass slides.

Gram's stained examination of the slide

Thin smears were made with the swabs then air dried, heat fixed and Gram stained. After drying the smears, they were examined under the oil emersion lens to look for the presence of pus cells, Gram negative diplococci, Gram positive or Gram negative bacteria, yeast like organisms with pseudohyphae, the number of lactobacilli present, mobiluncus and also for clue cells.

The number of clue cells, presence or absence of lactobacilli and presence or absences of pus cells were looked. The criterion suggested by (Nugent *et al.,.,* 1991) were used for scoring all the Gram's stained smears for diagnosis of bacterial vaginosis as follows :

1. Lactobacillus = 4+ =0 , 3+ = 1 , 2+ = 2 , 1+ = 3 , 0 = 4
2. Gardnerella =0 = 0 , 1+ = 1 , 2+ = 2 , 3+ = 3 , 4+ = 4
3. Mobiluncus = 0 =0 , 1+/2+ = 1 , 3+/4+ = 2.

The criterion for bacterial vaginosis is a total score of 7 or higher, a score of 4-6 is intermediate and a score of 0-3 is normal).

Culture

Routine culture was performed on Blood Agar and Mc Conkey agar, Human Bilayer Tween 80 Blood Agar, Sabouraud's Dextrose Agar. The entire plated medium was incubated at 37^{o}C for 24 hours and look for any specific growth.

The Human Bilayer Tween 80 Blood agar, Chocolate agar and Blood agar plates were incubated at 37^{0} C in a candle jar. Identification of the organisms isolated in routine culture media were done by Colony morphology of the organism which grew on routine culture media like Blood Agar and Mc Conkey Agar, Huam Bilayer Tween 80 Blood Agar, Gram's stain was done from the colonies, Motility of the organisms was determined by hanging drop preparation, by a battery of biochemical tests like catalase, oxidase, fermentation of glucose, lactose, mannitol, sucrose, slide coagulase, tube coagulase etc.

RESULTS

Out of a total of 93 samples, 31 samples showed no growth while 62 samples showed growth of various bacterial and *Candida* species isolates.

Table I. Isolation pattern of different organisms from clinical samples

Organisms	No of organisms	% of organisms
Pure *candida* species	28	30.01
Candida sp. with others	7	7.52
Gardnerella vaginalis	4	4.30
Trichomonas vaginalis	8	8.60
Trichomonas. vaginalis with others	4	4.31
Neisseria gonorrhoeae	0	0
Mixed bacterial growth	11	11.83
Sterile	31	33.33
Total	93	100

Table II. Distribution of different candida species isolated from clinical samples

Different candida sp.	No of diff. Candida sp.	% of diff. Candida sp.
C. albicans	28	80
C. intermedia	3	8.58
C. krusei	2	5.71
C. guilliermondii	2	5.71
Total	35	100

Table III. Age distribution of patients

Age	No of patients	% of patients
<20 years	2	2.15%
21-30 years	40	43.01%
31-40 years	37	39.78%
41-50 years	14	15.06%
Total	93	100%

Table IV. Distribution of patients according to their personal hygiene

Personal hygiene	No of patients	% of patients
Poor	85	91.39%
Fair	8	8.61%
Total	93	100%

Table V . Distribution of patients according to their complaints

Patient's complain	No of Patients	% of Patients
Pain L/A	24	25.80%
Pain L/A+ Frothy discharge	31	33.33
Curdy discharge	38	40.87
Total	93	100

Table VI . Distribution of patients according to their obstetrical history

Parity	No of patients	% of patients
Multiparous	83	89.23%
Nulliparous	5	5.37%
Total	93	100%

DISCUSSION

The organisms isolated from the 93 patients were as follows :- pure candida species 30.01% (28/93), mixed bacterial growth 11.82% (22/93) , *Trichomonas vaginalis* 8.60% (8/93), candida species with other organisms 7.52% (7/93) *Trichomona vaginalis* with others 4.31% (4/93), *Gardnerella vaginalis* 4.30% (4/93), *Neisseria gonorrheae* 0% (0/93). 33.33% (Table I). Out of 35 candida species 28/35 (80%) were identified as *Candida albicans* based on Germ Tube Test positivity, chlamydospore formation, fermentation of Glucose + Maltose with production of acid and gas. 3/35 (8.58%) was identified as *Candida intermedia* and 2/35(5.71%) were *Candida krusei* and *Candida guilliermondii*. (Table II). 31/93 of samples showed no growth in culture. The high percentage of sterile samples was probably due to previous self medication or use of antiseptic ointments or lotions by the patient. Howkes *et al.* (2002) found the prevalence of RTI among married women to be as follows- candidial infection 6.7%, HSV-2. 60%, bacterial vaginosis 5.9%, other recurrent sexually transmitted disease 3.1%, *Trichomonas vaginalis* 0.8%, syphilis 0.75% and *Neisseria gonorrhoea* and *Chlamydia trachomatis* 0.5%.The findings of this study are discrepant with that of the present study. This could be due to the fact that the study was conducted in Bangaladesh and the study group comprised of only married women. Bhalla P *et al.,* (2007) diagnosed bacterial vaginosis in 32.8% of subjects. In their study all women with vaginal trichomoniasis were also found to have bacterial vaginosis. Madhivanan *et al.* (2008) in their study found the prevalence of bacterial vaginosis to be 19%. In the present study however, only 4.3% of cases were diagnosed as bacterial vaginosis based on Nugent scoring and growth of *Gardnerella vaginalis*.

Majority of patients were in the age group of 21-30 years (43.01%), followed by the age group of 31-40 years (39.78%), 41-50 years (15.06%) , <20 years (2.15%). This is probably due to the fact that RTIs are more common in the sexually active reproductive age group (Table III). Jombo *et al.* (2010) reported similar findings in cases of vulvovaginal candidiasis (VVC) in Nigeria.

Most of patients had poor personal hygiene 85/93 (91.39%). Very few patients had reasonably good hygienic standards 8/93 (8.61%) (Table IV). This only shows that the occurrence of reproductive tract infection is directly proportional with the personal hygiene of the person concerned. Katihar Medical College, by and large, provides services to a rural population comprising of people belonging to lower socio-economic status, who are not able to maintain a high level of personal hygiene. This could be the reason why a great majority of patients in this study had poor personal hygiene. Jindal *et al.* (2007) in their study on vulvovaginal candidiasis reported that women with low socio-economic status and poor personal hygiene suffered more from VVC. Muula *et al.* (2006) also reported similar findings in Malawian women with Sexually Transmitted Infection.

Out of 93 patients attending the OPD or IPD, 38 women had complaints of curdy discharge (40.87%), 31 complained of pain lower abdomen with frothy discharge (33.33%), and 24 patients complained of pain lower abdomen (25.80%). This could be due to the fact that majority of patients, 35/93 (37.63%) of our patients were suffering from VVC (Table V). Jain *et al.* (1999) also reported that excessive vaginal discharge

was the most common presenting symptoms (42%) followed by lower abdominal pain (17.2%), genital ulcer (1.2%) and difficulty in urination (1.2%).This data matches with that of the present study. Srivastava *et al.* (2004)conducted a study to know the perception about reproductive tract infection among married women in Agra. They found that perception about vaginal discharge was found to be correct in two third urban women. According to their study, vaginal discharge was found in 24% of all their patients. Panda *et al.* (2006) also reported that the commonest symptom of RTI/ STD was vaginal discharge (91%) followed by lower abdominal pain (64%). These findings are similar with that of the present study. Majority of patients were multiparous 83/93 (89.25%) and only 10/93 (10.75%) were nulliparaous women. From this this finding it becomes apparent that increase in parity increases the chances of RTIs (Table VI). Rathore *et al*. (2007) found that the incidence of RTI increases with parity. RTI was least common in nulliparous (6%) and highest (76%) in multi and grand multiparous women.

Katihar Medical College is located in a rural area in Eastern Bihar which caters mainly to the rural population in the adjoining areas. The female population in this area are uneducated, mainly housewives or labourers who generally are unaware of or ignore ailments such as vaginal discharge and pain lower abdomen. However, in-spite of all these factors the occurrence of the RTI in our study group was relatively high with VVC being the most important cases of RTI. The syndromic approach for diagnosis of bacterial vaginosis was found to overestimate the actual number of cases and it is advisable to take the help of a laboratory where ever such facilities are available. Cases of gonorrhoea were conspicuously absent in our series of patients which is probably due to the fact that these organisms are difficult to grow, especially in women unless a selective medium is used. RTI is a disease that is highly prevalent both in urban and rural population and can be a significant cause of morbidity and distress to the women concerned. It can also lead to serious complications like PID and primary or secondary infertility. It is therefore the responsibility of the medical community to come forward not only to treat these patients but also to provide moral and emotional support to these patients in view of the stigma that is generally associated with any infective disease of the reproductive tract which according to the general public is invariably due to promiscuous behaviour of the person concerned. Education of the masses therefore is another aspect that will be of great help in reducing the burden of these diseases not only in women but also prevent spread of the diseases to their male partners.

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