International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Agrawal M et al. Int J Reprod Contracept Obstet Gynecol. 2019 Jul;8(7):2598-2603
www.ijrcog.org

pISSN 2320-1770 | eISSN 2320-1789

DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20192638

Original Research Article

Etiopathogenesis of vaginal discharge among married women in reproductive age group residing in rural area of Bhojipura District, Western Uttar Pradesh, India

Monica Agrawal[1]*, Nitu Nigam[2], Ruchica Goel[3], J. K. Goel[4], Mukesh Shukla[5]

[1]Department of Obstetrics and Gynecology, King George's Medical University, Lucknow, Uttar Pradesh, India
[2]Department of CFAR, Cytogenetics Unit, King George's Medical University, Lucknow, Uttar Pradesh, India
[3]Consultant and IVF Specialist, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, India
[4]Department of Obstetrics and Gynecology, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, India
[5]Department of Community Medicine, Veer Chandra Singh Garhwal Government Institute of Medical Sciences and Research, Garhwal, Uttarakhand, India

Received: 01 June 2019
Accepted: 12 June 2019

***Correspondence:**
Dr. Monica Agrawal,
E-mail: dr.monikagrawal@gmail.com

ABSTRACT

Background: Vaginitis is one of common medical problem in women that often results in frequent medical consultations. Aim was to study the clinico-epidemiological profile and etiopathogenesis of various causes of vaginal discharge among females in age group 18-45 years residing in rural area of Bhojipura district.
Methods: This Hospital based cross sectional study was conducted over a period of one year (March 2011 to February 2012) among 150 females aged 18-45 years presenting with the complaint of vaginal discharge. Information on sociodemographic data was obtained with the aid of questionnaires. Samples were obtained with two dry cotton-wool tipped swabs from vaginal fornices and were send to Department of Microbiology.
Results: The prevalence rate of vaginal discharge was found to be 24.6% among females in reproductive age group attending the outpatient department from rural background. Out of 150 patients who were enrolled for study 86 (57.30%) were diagnosed with non-infective discharge while 64 (42.60%) patients with infective discharge. Bacterial vaginosis was detected in 25 (39.1%), Candida albicans was detected in 23 (35.9%), *T. vaginalis* in 4 (6.3%) and mixed infections were found in 12 (18.7%). According to vagina flora morphology 85 (56.6%) had normal morphology, 30 (20%) had shift from normal flora and 35 (23.3%) had definitive bacterial vaginosis. About 20.5% females with Candida based etiology were diabetic.
Conclusions: Some common reproductive tract infections can be diagnosed and managed at primary level health facilities. This promotes community awareness through behavior change communication which includes safer sex practices, awareness of HIV and appropriate and timely health care seeking behavior.

Keywords: Etiopathogenesis, Etiology, Microflora, Reproductive age group, Risk factors, Vaginal discharge

INTRODUCTION

Vaginal discharge is one of the common complaints among sexually active females, particularly in South East Asia region where about one-fourth of all adult women in reproductive age-group report this along with clinically significant signs and symptoms. The World Health Organization has recommended syndromic management, in which women complaining of discharge are treated for some or all of the five common reproductive tract

infections i.e. Chlamydia trachomatis infection, gonorrhoea and trichomoniasis, which are sexually transmitted infections and bacterial vaginosis and candidiasis, which result from disturbance in the normal bacterial flora of vagina.[1] It is estimated that reproductive and sexual ill-health accounts for 20% of the global burden of ill-health for women.[2]

Reproductive morbidity is a broad concept that encompasses health problems related to reproductive organs and functions. Reproductive morbidity can be broadly categorized into obstetric morbidity, gynecological morbidity and contraceptive morbidity. Reproductive morbidity in general, is an outcome of not just biological reasons but of women's poverty, powerlessness and lack of control play an intervening role too. Over past few decades, the global emergence of sexually transmitted infections has bought attention to women's reproductive and sexual health.[3] Reproductive Tract Infections (RTIs) including sexually transmitted infections (STIs) are silent epidemics and rank second as the cause of healthy life lost among women of reproductive age after maternal morbidity and mortality in developing countries.[4,5]

Though there has been increasing concern over the general health and morbidity status of women in India but there is paucity of evidence base about various dimensions of reproductive morbidity. On other side, recent efforts in different developing countries like India to study reproductive morbidity at community level suggest a quite high prevalence. There are only few studies about reproductive morbidity in western Uttar Pradesh, therefore a need was felt to carry out survey in married women (age group 18-44 years) in rural area of Bhojipura, Bareilly district to study the prevalence of infectious and non-infectious etiology amongst vaginal discharge cases. Secondarily an attempt was also made to study the distribution of vaginal discharge cases with respect to biosocial characteristics and known risk factors.

METHODS

This hospital based cross-sectional study conducted in Department of Obstetrics and Gynaecology, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly in collaboration with Department of Microbiology for laboratory assessment over a period of one year (March 2011-Febuary 2012). The catchment area of institute primarily covers a wide rural population of Bhojipura district. Adult females in reproductive age-group (18-45 years) attending the out-patient facility of institute. Sexually active married females presenting with vaginal discharge from rural areas of Bhojipura district Females giving a written informed consent for participation were included in the study. Females with any pathology of cervix like cervicitis, cervical erosions etc. Females with complain of vaginal discharge from urban areas were excluded in the study.

Sampling technique

Complete enumeration process was used. All the females fulfilling the exclusion and exclusion criteria during the time frame of study were enrolled in the study. A maximum 150 study subjects were enrolled.

Study procedure

Before the start of the study participants were told about the purpose of the study and along with guarantee of anonymity to the individual was made. Study participants were then interviewed after taking informed written consent. Information on sociodemographic data was obtained with the aid of questionnaires. Examination included a routine general and systemic examination followed by per speculum examination. Per speculum examination noted the characteristic of vaginal discharge like colour, odour, consistency and amount of discharge as well as any inflammation of cervix causing increased redness of cervix or bleeding.

Data collection

Information on sociodemographic data was obtained with the aid of questionnaires. A pretested semi structured schedule prepared in consultation with faculty members at Obstetrics and Gynecology department of SRMSIMS Bareilly. It sought information on socio-demographic characteristics, characteristics of discharge like duration, onset, timing with menstruation, color, odor consistency and any precipitating factor like sexual intercourse, sexual history, symptoms of vaginal discharge like lower abdominal pain, itching/ soreness/irritation of vagina or vulva, dysuria/burning micturition intermenstrual and postcoital bleeding, prescribed medications: antibiotics/hormone preparations/OCP's, personal hygiene characteristics like douching, menstrual history.

Vaginal flora assessment and microbiological procedures

Samples were obtained with two dry cotton-wool tipped swabs from vaginal fornices. One of the swabs was pressed briefly against an indicator paper to measure the pH. Then this swab was used for wet mount saline microscopy and 10% KOH for amine testing (Whiff test). The second swab was used for Gram staining, bacterial culture, fungal culture and germ tube test. Later a bimanual examination was performed. Blood sample was collected for serological test for other reproductive tract infections like syphilis, hepatitis B and HIV. Pap smear was also collected for cytology.

Differential etiological diagnosis

Trichomoniasis was diagnosed by the presence of green yellow frothy discharge and strawberry vagina on clinical examination and by (wet mount) positivity in direct microscopy (flagellated anaerobic protozoa). Candidiasis

was diagnosed clinically by presence of curdy white discharge and in lab on the basis of positivity in direct microscopy by visualization of pseudo hyphae (mycelia) and/or budding yeast (conidia) on KOH or saline wet preparation and or fungal culture in sabouraud's dextrose agar and germ tube test

Bacterial vaginosis was diagnosed by the presence of a homogenous white discharge on speculum examination. Whiff test was performed in which 10% KOH was added to vaginal discharge and sniffing of the mixture was done. The test was interpreted as positive if it has fishy odor. Gram staining of vaginal discharge was done and examined under oil immersion objective (1000 × Magnification) and graded as per standardized, quantitative morphological classification developed by Nugent et al. Composite score was categorized into three categories as normal (0-3), intermediate (4-6), and bacterial vaginosis (7-10).[6] Laboratory testing included measurement of vaginal pH, whiff test, high vaginal swabs, wet mount saline microscopy, gram staining, bacterial and fungal culture and germ tube test.

This study was approved by Ethics Committee of SRMSIMS Bareilly. Patients were first briefed about the purpose of the study and assured regarding the confidentiality of the data given. After written consent was obtained from the participants, they were interviewed. Treatment of vaginal discharge was given as per syndromic approach based on clinical diagnosis.

Statistical analysis

Data collected was analyzed according to aims and objectives using Epi-Info software.[7] The descriptive results were presented in forms of frequency and means while the associations were expressed using Chi-square test. P value <0.05 was considered to be significant.

RESULTS

On an initial screening of all sexually active adult females in reproductive age-group who attended the gynecological out-patient facility of the institute during time frame of study, 24.6% (150 subjects out of 609) reported the symptom of vaginal discharge. These 150 patients with presenting with complaint of vaginal discharge finally constitute our sample for the study.

Out of 150 patients who were finally enrolled for the study 86 (57.30%) were diagnosed with non-infective discharge and 64 (42.60%) patients were diagnosed with infective discharge. Bacterial vaginosis was detected in 25 (39.1%), candida albicans was detected in 23 (35.9%), *T. vaginalis* in 4 (6.3%) and mixed infections were found in 12 (18.7%). According to the vagina flora morphology 85 (56.6%) had normal morphology, 30 (20%) had shift from normal flora (score 4-6) and 35 (23.3%) had definitive bacterial vaginosis (score >7). The most common clinical presentation in patients with vaginal discharge was lower abdominal pain in 48.0% followed by itching and dysuria in 38.0% and 27.3% patients respectively (Table 1).

Table 1: Distribution of vaginal discharge cases on the basis of clinico-etiological profile (N=150).

Clinico-etiological characteristic	Number (%)
Nature of etiology	
Infectious	64 (42.6)
Non-infectious	86 (57.3)
Etiology of infective vaginal discharge (n=64)	
Bacterial vaginosis	25 (39.1)
C. albicans	23 (35.9)
T. vaginalis	4 (6.3)
## Mixed	12 (18.7)
Vaginal flora morphology (Quantitative morphological classification) #	
Normal (0-3)	85 (56.6)
Intermediate (4-6)	30 (20.0)
Definitive bacterial vaginosis (7-10)	35 (23.3)
Clinical presentation*	
Pain	72 (48.0)
Itching	57 (38.0)
Dysuria	41 (27.3)
Dyspareunia	28 (18.6)
Post-coital bleeding	9 (9.1)

*Multiple response, # Nugent et al. [], ## Includes mixed co-infection of C. albicans, T. vaginalis etc. with or without bacterial vaginosis.

Association between bacterial vaginosis (with respect to quantitative morphological classification) and other STIs shows that definite bacterial vaginosis (with and without coinfection) was found to coexist with 14.2% cases of trichomoniasis and 26.4% cases of candidiasis. However, none of the HIV positive women had definite bacterial vaginosis. This association between bacterial vaginosis and other sexually transmitted infection was found to be statistically non-significant (Table 2).

Mean age of presentation was 30.5±5.7 years. The highest prevalence of infective as well as non-infective (for all the etiologies) discharge found in age group of 26-35 years. Definite bacterial vaginosis (with or without coinfection) was found to be the most prevalent etiology for vaginal discharge (54.6%) followed by candida infection in isolation or mixed form (53.1%) and trichomonas vaginalis infection in isolation or mixed form (10.9%). The highest prevalence of each and every infective etiology of vaginal discharge was found to be highest in age-group 26-35 years. Also, the proportion of females presenting with vaginal discharge were higher among the subjects who belonged to Hindu religion (Table 3).

Almost one-third cases of non-infective vaginal discharge (30.2%) and bacterial vaginosis (34.2%) had the history of abortion. About 42.8% cases with trichomonas

infection (isolated+ mixed) also had history of abortion. Only one-tenth of patients with vaginal discharge had history of smoking. About one-fifth (20.5%) of females with vaginal discharge with Candida based etiology were diabetic. Trichomonas infection was 42.8% of females with vaginal discharge in spite of personal hygiene. The contraception use was found to be almost 50.0% among the cases of vaginal discharge with non-infective, Candida or Trichomonas based etiology. However, only one-fifth cases of bacterial vaginosis reported the recent utilization of any contraceptive measure (Table 4).

Table 2: Association between bacterial vaginosis with other sexually transmitted infection.

Characteristic	Status	Number (%)	Vaginal flora morphology		
			Definite bacterial vaginosis (with/without infection) (n=35)	Intermediate (n=30)	Normal (n=85)
Trichomoniasis	Positive	7 (4.6)	1 [14.2] (2.8)	3 [42.8] (10.0)	3 [42.8] (3.5)
	Negative	143 (95.3)	34 [22.6] (97.1)	27 [18.7] (90.0)	82 [56.9] (96.4)
			$\chi^2=2.42$ (df=2); p=0.298		
HIV	Positive	2 (1.4)	0 [0.0] (0.0)	1 [50.0] (3.3)	1 [50.0] (1.1)
	Negative	148 (98.5)	35 [22.4] (100.0)	29 [19.5] (96.6)	84 [57.9] (98.8)
			$\chi^2=1.38$ (df=2); p=0.501		
Candidiasis	Positive	34 (22.6)	9 [26.4] (25.7)	8 [23.5] (26.6)	17 [50.0] (20.0)
	Negative	116(77.3)	26 [22.4] (74.2)	22 [18.9] (73.3)	68 [58.6] (80.0)
			$\chi^2=0.804$ (df=2); p=0.669		

*p<0.05 is considered as significant; data in parenthesis () corresponds to column percentage; data in square brackets [] corresponds to row percentage.

Table 3: Association of laboratory confirmed results etiology of patients with vaginal discharge with biosocial characteristics.

Characteristic		Laboratory confirmed cases			
		Non-infective (n=86)	Definite bacterial Vaginosis (with/ without infection) (n=35)	Candida infection (Isolated+ Mixed) (n=34)	Trichomonas infection (Isolated +Mixed) (n=7)
Age (Years)	18-25	26(30.2)	11 (31.4)	10 (29.4)	1 (14.2)
	26-35	48 (55.8)	15 (42.8)	19 (55.8)	5 (71.4)
	36-45	10 (11.6)	9 (9.3)	5 (14.7)	1 (14.2)
Religion	Hindu	59 (68.6)	26 (74.2)	28 (82.3)	5 (71.4)
	Non-Hindu	27 (31.3)	9 (25.7)	6 (17.6)	2 (28.4)

Data in square brackets ()corresponds to column percentage.

Table 4: Association of laboratory confirmed results etiology of patients with vaginal discharge with other risk factors.

Characteristic	Laboratory confirmed cases			
	Non-infective (n=86)	Bacterial vaginosis (n=35)	Candida infection (Isolated + Mixed) (n=34)	Trichomonas infection (Isolated+ Mixed) (n=7)
History of abortion	26 (30.2)	12 (34.2)	9 (26.4)	3 (42.8)
Smoking	7 (8.1)	4 (11.4)	4 (11.7)	1 (14.2)
Diabetes	12 (13.9)	1 (2.8)	7 (20.5)	0 (0.0)
Personal hygiene (Douching)	15 (17.4)	4 (11.4)	8 (23.5)	1 (42.8)
Contraception Utilization	44 (51.1)	7 (20.0)	15 (44.1)	4 (57.1)

Data in square brackets () corresponds to column percentage.

About 40.7% of the asymptomatic patients of vaginal discharge were having normal vaginal flora morphology based on quantitative morphological classification. Pain in lower abdomen was observed in one-fifth (26.3%) of

cases of vaginal discharge with Candida infection. Among 43.0% patients with itching had normal vaginal flora morphology followed by Candida infection (28.0%). Also, Candida infection was found among 17.0% of the patients with complaint of dysuria. About two-fifth cases (40.0%) with complaint of dyspareunia and one-fifth (22.2%) with post coital bleeding, Candida was found to be associated with vaginal discharge (Table 5).

Table 5: Distribution of vaginal discharge cases on the basis of clinical presentation (N=50).

Clinical presentation	Etiological profile of cases presenting with vaginal discharge				
			Vaginal flora morphology		
	Candida	Trichomonas	Definite bacterial vaginosis (with/without infection) (n=35)	Intermediate (n=30)	Normal (n=85)
Asymptomatic (n=27)	8 (29.6)	0 (0.0)	2 (7.4)	6 (22.2)	11 (40.7)
Pain lower abdomen (n=72	19 (26.3)	3 (4.1)	14 (19.4)	7 (9.7)	29 (40.2)
Itching (n=57)	16 (28.0)	5 (8.7)	8 (14.0)	3 (5.2)	25 (43.8)
Dysuria (n=41)	7 (17.0)	6 (14.6)	7 (17.0)	8 (19.5)	13 (31.7)
Dyspareunia (n=28)	11 (39.2)	1 (3.5)	3 (10.7)	5 (17.8)	8 (28.5)
Post coital bleeding (n=9)	2 (22.2)	0 (0.0)	1 (11.1)	2 (22.2)	4 (44.4)

Data in square brackets [] corresponds to row percentage.

DISCUSSION

The prevalence of vaginal discharge reported in the present study was found to be 24.6%; implies that every fourth women suffers from vaginal discharge in the screened population similar proportion of women suffering from vaginal discharge, were also reported by Singh AJ et al., where they found vaginal discharge as one of the commonest reproductive health problems of women.[8] In one of the other Indian study by Kulkarni RN et al, leucorrhoea was reported among 27.4% women.[9] However, few other studies had reported comparatively lower prevalence of vaginal discharge among the females.[10,11] This might be because these studies were population based. Also, the variation in the criteria of the age-group used in choosing study population might be playing an intervening role too.

In our study vaginal discharge was found to be more among female in age group 26-35 years. This was in coherence with the finding of previous studies, where it was reported that majority of vaginal discharge cases were from similar age-group.[1,8] This might be because female in age group 26-35 years are more sensitive and awake towards their health as compared to the younger group, and are more serious towards their reproductive health as compared to older age-group owing to be presently at the most reproductive phase of their life stage.

Patel V et al, also reported high prevalence of vaginal discharge among Hindus similar to the finding of present study.[1] Gynecological symptoms like itching in genital area, blisters in genital area, pain in lower abdomen and burning during micturition were found to be strongly associated with vaginal discharge in this study, similar association was shown by Patel V et al.[1] Overall prevalence of vulvaritching was 38.0% and pain in lower abdomen was reported among 48.0% of the patients. Similar findings were also reported in a study conducted in Goa by Tanksale et al.[12] As in our study, Kulkarni et al, also show significant association of discharge with high parity.[9] In present study vaginal discharge was found to be more among women with history of abortion, induced abortion and last delivery non-institutional. Sharma AK et al, in their study reported that last delivery domiciliary or conducted by dai and history of abortion to be significantly associated with reproductive infection; whereas study conducted by Rathore M et al, reported no association of place of delivery with reproductive tract infection.[13,14] Vaginal discharge was found to be more among those women who were using IUCD's. Pant B et al, in their study conducted in one of the rural areas of Meerut shows RTI to be more among women adopted sterilization and minimum among those using oral pills.[15] This is in coherence with the finding of present study.

The study recommends for creating community awareness about health care facilities and instills self-concern in women for their own health needs. Built-in service component and confidentiality may improve self-reporting of reproductive morbidity in survey.

However, the small sample size was one of the major limitations of the present study. Since the study was conducted at a private tertiary care institution and a convenient sample was taken through complete enumeration process (during the time frame of study), the findings are subjected to selection bias.

Therefore, the results might not be generalized to the whole population. But such survey could prove to be an inexpensive way for generating continuous information on reproductive health issues for health managers.

CONCLUSION

The study reveals that prevalence of reproductive morbidity is very high among rural women in Bareilly district of Uttar Pradesh. It is necessary to increase awareness among women regarding symptoms and consequences of RTI/STI through information, education, and behaviour changes. This would go a long way in reducing reproductive morbidity among sexually active population of our country. A standard approach among cases with abnormal vaginal discharge is necessary to assess the etiology and arrive at appropriate therapy accordingly.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee of SRMSIMS Bareilly, Uttar Pradesh, India

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Cite this article as: Agrawal M, Nigam N, Goel R, Goel JK, Shukla M. Etiopathogenesis of vaginal discharge among married women in reproductive age group residing in rural area of Bhojipura District, Western Uttar Pradesh. Int J Reprod Contracept Obstet Gynecol 2019;8:2598-603.