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A study on microbiological profile in women with symptomatic vaginal discharge

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Abstract

Background and Objective: Abnormal vaginal discharge is characterized by change of colour, consistency, volume, or odour, and may be associated with symptoms such as itch, soreness, dysuria, pelvic pain, or intermenstrual or post-coital bleeding. Main objective of the study is to know the incidence of symptomatic vaginal discharge in various age groups and to know the microbiological profile in women presenting with symptomatic vaginal discharge.

Methods: The study was conducted in the department of OBG, EPIONE Hera Hospitals over a period of 20 months Aug 2018- Apr 2020 among women complaining of vaginal discharge of various degrees who fulfilling the inclusion and exclusion criteria were included in the study. A detailed clinical history and examination of all cases were done, a speculum was inserted into the vagina, to visualize cervix and vagina, any pathology in the cervix and vagina noted, swabs were collected from the posterior fornix of vagina and sent for microbiological examination. Following tests were done a) Gram staining and Nugent scoring system used, based on the morphology of the bacteria, score 0 to 7 is considered positive for bacterial vaginosis, b) Wet mount preparation done to look for motility of *Trichomonas*, c) KOH preparation, d) Swabs are inoculated in Blood agar, Mac Conkey's agar and Sabouraud's dextrose agar.

Results: Out of 260 cases, majority of the patients 145 (55.76%) were in the age group of 19-28 years, followed by 91 (35%) cases in the age group 29-38 years, 21 (8.07%) cases in age Group 39-48 and 3 (1.15%) were below 19 years. Maximum 128 (49.23%) were illiterate, followed by 82 (31.53%) were with primary schooling educational status. Most of the women 160 (61.53%) were in the lower socioeconomic status followed by 62 (23.84%) upper lower class. Majority patients 161 (61.92%) had associated combined symptoms of foul smell and itching, others like only vaginal discharge 51 (19.61%) abdominal pain 18 (6.92%), burning micturition 13 (5%), heavy menstrual bleeding (3.46%) and lower backache 8 (3.07%) were noted. Large part 98 (37.69%) showed mucopurulent discharge, followed by 89 (34.23%) yellowish and foamy discharge, curdy white 46 (17.69%) and homogenous discharge 27 (10.38%). Prevalence of bacterial vaginosis is maximum 122 (46.92%), followed by *Trichomonas vaginalis* 99 (38.07%), vaginal candidiasis 18 (6.92%), other nonspecific 9 (3.46%). In around 10 (3.84%) of cases no cause was identified.

Conclusion: White discharge is one of the major women public health problem, principle morbidity to the women in terms of loss of self-esteem, reduction in work time, increased hospital visits and their expenses and also vulnerable to pelvic inflammatory diseases, infertility, endometriosis, cuff cellulitis, urethral syndrome, spontaneous abortions, preterm labor etc. So, it is very important for microbiological diagnosis of abnormal vaginal discharge especially, when a patient is having recurrence or not responding to standard therapy. Increase of educational status in urban and rural areas is considered one of the greatest way to reduce the genital health problems.

Keywords: Vaginal discharge, bacterial vaginosis, candidiasis, trichomoniasis

Introduction

Normal physiological discharge changes with the menstrual cycle. It is thick and sticky for most of the cycle, but becomes clearer, wetter, and stretchy for a short period around the time of ovulation. These changes do not occur in women using oral contraceptives.

Normal vaginal discharge may be large in volume but typically does not have a strong odor, nor is it typically associated with itching or pain.

The term "leucorrhoea" is defined as excessive normal vaginal discharge.

The physiological secretions may increase at puberty, premenstrually, at the time of ovulation, at start of HRT or hormonal contraception and during sexual arousal.

Abnormal/pathological vaginal discharge is associated with change in colour, consistency, volume, or odour, and may be associated with symptoms such as itch, soreness, dysuria, pelvic

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pain, or inter-menstrual or post-coital bleeding [1].

Abnormal vaginal discharge predisposes to pelvic inflammatory diseases, infertility, endometriosis, post hysterectomy cuff infection, urethral syndrome, pregnancy loss, preterm labour, premature rupture of membrane, low birth weight, increase susceptibility to sexually transmitted infections (STI), including HIV. History and examination of the patient done to know whether it is physiological or pathological and also to know the cause of vaginal discharge and further management. Onset, duration, timing related to menstrual cycle, odour, colour, consistency and any aggravating factors. If associated with itching, pain abdomen, dysuria, dyspareunia and menstrual disturbances should be enquired.

Sexual history is taken along with routine gynecological history. Examination includes inspection of external genitalia, vulva, vagina and cervix for any signs of inflammation, nature of discharge, foreign body or any growth and bimanual examination to look for associated pelvic inflammatory diseases and appropriate vaginal swabs obtained [2].

Objective of the study

1. To know the incidence of symptomatic vaginal discharge in various age groups.
2. To know the microbiological profile in women presenting with symptomatic vaginal discharge

Materials and Methods

The study was conducted in the department of OBG over a period of 20 months Aug 2018- Apr 2020 among women presenting with vaginal discharge

Inclusion criteria

1. All women presenting to gynecology OPD with symptomatic vaginal discharge.

Exclusion criteria

1. Menstruating women.
2. Pregnant women.
3. Women who had delivered/ undergone abortion in last 6months.
4. Treated with antimicrobial/ antifungal in the last 1 month.
5. Women who had intercourse in the last 72 hrs.

Those fulfilling the inclusion and exclusion criteria were included in the study.

A detailed clinical history and examination of all cases were done, a speculum was inserted into the vagina, to visualize cervix and vagina, any pathology in the cervix and vagina noted, swabs were collected from the posterior fornix of vagina and sent for microbiological examination.

Following tests were done

Wet mount preparation

Microscopic examination of saline wet mount preparation of vaginal discharge is done. A drop of discharge is mixed saline on a glass slide, covered with clean cover slip and examined under high power for the presence of epithelial cells, pus cells, clue cells and Trichomonas [3,4].

Gram stain

Nugent's scoring⁵ system for bacterial vaginosis based on morphology of microorganisms per high per field.

Diagnosing criteria

The Nugent criteria score vaginal flora normal (0-3) intermediate (4-6) and (7-10) were considered as BV positive and followed up.

Identification of the isolates

Organisms grown were then identified on the basis of their microscopic morphology, Gram's staining characteristics, colonial and cultural characteristics, and biochemical reactions as per the standard protocol using standard laboratory procedures.

Results

Table 1: Age Wise Distribution

Age in years	Number of Patients (N=260)	Percentage (%)
< 19	3	1.15%
19-28	145	55.76%
29-38	91	35%
39-48	21	8.07%
Total	260	100

Majority of the patients, 145 (55.76%) were in the age group of 19-28 years, followed by 91 (35%) cases in the age group 29-38 years and 21 (8.07%) cases in age group 40-49 years. There were only 3 (1.15%) subjects below 19 years.

Table 2: Distribution According to Educational Status

Educational Status	Number Of Cases(n=260)	Percentage (%)
Illiterate	128	49.23%
Primary Schooling	82	31.53%
Secondary Schooling	31	11.92%
Undergraduate	10	3.84%
Graduation	9	3.46%
Total	260	100%

Maximum cases 128 (49.23%) were illiterate from rural background, 82 (31.53) had Primary schooling, followed by secondary schooling 31 (11.92%), 10 (3.84%) completed undergraduate level of education and 9 (3.46%) were graduates.

Table 3: Distribution According To Socioeconomic Status

Socioeconomic Status	Number of Patients (N=260)	Percentage (%)
Upper class	8	3.07%
Upper middle class	12	4.61%
Lower middle class	18	6.92%
Upper lower class	62	23.84%
Lower class	160	61.53%
Total	260	100%

Majority of patients come under lower class 160 (61.53%), followed by upper lower class 62 (23.84%), lower middle class

18 (6.92%), 12 (4.61%) upper middle class and 8 (3.07%) were under upper class of socioeconomic group.

Table 4: Associated Symptoms with Vaginal Discharge

Symptoms	Total number of patient (N=260)	Percentage (%)
Foul Smell and Itching	161	61.92%
Vaginal Discharge alone	51	19.61%
Abdominal Pain	18	6.92%
Burning Micturition	13	5%
Heavy Menstrual Bleeding	9	3.46%
Low Backache	8	3.07%
Total	260	100%

Out of 260 cases, foul smell with itching was most common presenting complaint in 161 (61.92%) cases, next commonest being vaginal discharge alone in 51 (19.61%) and abdominal pain in 18 (6.92%).

Table 5: Distribution according to colour of discharge

Type of discharge	Number of cases (N=260)	Percentage (%)
Homogenous	27	10.38%
Mucopurulent	98	37.69%
Curdy White	46	17.69%
Yellowish And Frothy	89	34.23%
Total	260	100%

Majority of patients 98 (37.69%) presented with mucopurulent, followed by yellowish and frothy in 89 (34.23%), curdy white 46 (17.69%) and homogenous discharge was observed in 27 (10.38%).

Table 6: Comparison of wet mount results

Wet mount	Number of patients (N=260)	Percentage (%)
Clue cells	30	11.53%
Pus cells	63	24.23%
Trichomonas	99	38.07%
Inconclusive	68	26.15%
Total	260	100%

Results were conclusive in 192 (73.84%) cases which includes 99 (38.07%) *Trichomonas*, 63 (24.23%) cases showed pus cells followed by 30 (11.53%) of clue cells and about 68 (26.15%) were inconclusive.

Table 7: Distribution Based On Nugent Score

Nugent Score	Number of patients(N=260)	Percentage (%)
Normal (0-3)	41	15.76%
Intermediate (4-6)	99	38.07%
Bacterial Vaginosis (7-10)	122	46.92%
Total	260	100%

122 (46.92%) cases had Bacterial vaginosis, intermediate in 99 (38.07%), and Normal in 41 (15.76%) cases were observed.

Table 8: Diagnosis

Diagnosis	Number of Patient (N=260)	Percentage (%)
Bacterial vaginosis	122	46.92%
Vaginal Candidiasis	18	6.92%
Other non-specific	9	3.46%
<i>Trichomonas vaginalis</i>	99	38.07%
Normal vaginal flora	10	3.84%
Total	260	100%

Out of 260 cases, Bacterial vaginosis was most common cause of white discharge in 122 (46.92%) cases followed by *Trichomonas vaginalis* 99 (38.07%), vaginal candidiasis 18

(6.92%) and nonspecific in 9 (3.46%) cases were observed. Out of 260 subjects 10 (3.84%) were identified with normal vaginal flora

Table 9: Species of Candida

Species	Number of cases(n=18)	Percentage%
<i>Candida albicans</i>	13	72.22%
<i>Candida parapsilosis</i>	5	27.77%

Candida albicans 13 (72.22%) and 5 cases (27.77%), *Candida parapsilosis*

Table 10: Other Organism Isolated

Organism	Number of cases	Percentage%
<i>E. coli</i>	56	21.53%
<i>Enterococcus</i>	50	19.23%
<i>Staphylococcus aureus</i>	48	18.46%
<i>Acinetobacter</i>	22	8.46%
Coagulase Negative	63	24.23%
<i>Staphylococcus</i>		
<i>Pseudomonas aeruginosa</i>	11	4.23%
<i>Klebsiella</i>	10	3.84%

E. coli is isolated in 56 cases, followed by *Enterococcus* in 50 cases, Coagulase Negative *Staphylococcus* in 63 cases were reported

Discussion

Vaginal discharge is one the most common symptoms with which women present to gynecological OPD. There are numerous causes for vaginal discharge, it may be physiological or pathological. Pathological conditions may be infective or non-infective.

A total of 260 cases who presented with vaginal discharge were included in the study.

Study showed that the prevalence rate is higher in the younger age group between 19-28 years 145 (55.76%) followed by age 29-38 (35%) and 39-48 (8.07%) which is in concordance various other studies Gunturi L *et al.* [6]; 15-24 years, 25-34 years, 35-44 years, 45-54 years, 33%, 72%, 52%, 10% respectively. It could be due to early marriage age in our population, lack of awareness about use of contraceptives methods, early childbearing and obstetric morbidity. However, Choudary *et al.* [7], reported higher prevalence among married women who are 40 years of age. There is decrease in the prevalence of vaginal discharge with an increase in educational status in this study. Patel V *et al.* [6], Choudhry V *et al.* [7] observed a similar pattern in their studies. This may be due to awareness about contraceptive methods and proper hygiene.

Kulkarni *et al.* [8] and Choudhry V *et al.* [9], showed in their studies that prevalence of vaginal discharge in women belonging to lower class and lower middle class. Our study was in concordance with the above with the prevalence in 61.53% of them belonging to lower class, 23.84% upper lower class, and 6.92% lower middle class. Poor personal and genital hygiene

like improper cleaning of genitalia after urination or non-availability of adequate amount of water for cleaning, use of clothes instead of sanitary pad may be the cause for the above observation.

In our study 61.92% had itching and foul smelling vaginal discharge as presenting complaint, around 19.61% patients presented with only vaginal discharge. 18.47% of present subjects showed other associated symptoms like abdominal pain (6.92%), burning micturition (5%), heavy menstrual bleeding (3.46%), low backache (3.07%) which had similar trends in Gunturi *et al.* [10], Choudary *et al.* studies. Out of 260 cases, mucopurulent discharge was more prevalent 37.69%, followed by yellowish and frothy 34.23%, curdy white 17.69% and homogenous 10.38%. Study by Masand DL *et al.* [11] had a dissimilar observation.

In our study, organisms causing abnormal vaginal discharge was seen in 96.15% of which Bacterial vaginosis (46.92%) was most common cause followed by *Trichomonas vaginalis* (38.07%), vaginal candidiasis (6.92%) and other nonspecific organisms (3.46%). These observations are not in concordance with Puri KJ *et al.* [12] and Fox *et al.* [13] studies.

Bacterial vaginosis was the most common etiological factor for vaginal discharge in our study population (46.92%), maximum were in the age group of 19-28 (55.76%) and presented with mucopurulent discharge (37.69%) with foul smell and itching (61.92%) as frequent complaint. These findings are similar to studies done by Mahadani *et al.* [14] (44.3%) and Kamara *et al.* [15] (44.10%) and is in discordance with studies by Koumans *et al.* [16] (29.2%) and

Pawanerkar *et al.* (19%) which may be due to geographical distribution. The high incidence of bacterial vaginosis may be due to frequent sexual intercourse and subsequent frequent washing with disinfectant. We also observed other organisms from samples like *E.coli* (21.53%), Coagulase negative *staphylococcus* (24.23%), *enterococcus* (19.23%) *Staphylococcus* (18.46%), *Acinetobacter* (8.46%), *Pseudomonas aeruginosa* (4.23%), *Klebsiella* (3.84%) were isolated.

In our study incidence of vaginal candidiasis (6.92%) is not compared favorably to that of Ries *et al.* (20-25%), Kamara *et al.* (30.7%) with majority of cases affecting 20-29 years (46.5%) presenting with curdy white discharge (83.7%) and itching (46.5%) as most frequent Symptoms. Though vaginal candidiasis is not a sexually transmitted disease majority of cases are seen in this age group due to increased estrogen concentration which is the basis for its pathogenesis and also may be because of use of OCP's as contraception, which is another predisposing factor for vaginal candidiasis. Along with *Candida*, *Klebsiella* (3.84%), *Enterococcus* (19.23%), *E.coli* (21.53%) and *Staphylococcus* (24.23%) were isolated in our study.

Incidence of *Trichomonas vaginalis* (38.07%) in our study is in favour with studies conducted by Venugopal *et al.* [17] (25%) and Lally *et al.* [18] (43%) and it is in contrast to study by Malla *et al.* [19] (10%) and Khan *et al.* [20] (5%). This variation in clinical trend may be because of geographical distribution, less cases of acute symptoms, increasing number of asymptomatic cases and also use of drugs like metronidazole and tinidazole for various gynaecological and obstetric conditions. *Trichomonas* cases were maximum among 19-28 years (55.76%), presenting with yellowish discharge (34.23%) with itching and foul smell (61.92%) as most frequent symptom We observed 3.46% with other nonspecific organisms were grown which include *E. coli*, *Enterococcus*, *Staphylococcus aureus*, coagulase negative *staphylococcus*, *Pseudomonas aeruginosa* and *Klebsiella*.

These organisms constitute a part of normal flora of female genital tract and according to Larsen B *et al.* the normal flora may be a source of disease causing organisms or may interact antagonistically or synergistically with exogenous pathogens, it is important to characterize physiologic determinants of the genital microflora. Among 9 patients with the above growth 86% were associated with mucopurulent discharge and had associated symptoms like foul smelling discharge (37%), burning micturition (16.2%), itching (29.56%), pain abdomen (12.7%), low backache (5.6%). Hence it is important to correlate individual cases clinically and manage accordingly. Mucopurulent discharge is also associated in other conditions like chlamydial and gonococcal infection but it is a rare cause of vaginal discharge and diagnosis requires special tests for diagnosis.

In 10 (3.84%) cases no pathogenic organisms were isolated, these results are in agreement with the study by Masand L T *et al.* This may be physiological as none of them had any associated symptoms.

Conclusion

Abnormal vaginal discharge is one of the major public health problems with Known predisposing factors are poor hygiene, low socioeconomic status, early sexual activity and multiple partners, causing morbidity to the women in terms of loss of self-esteem, reduction in work time, increased hospital visits, also predisposes to pelvic inflammatory diseases, infertility, endometriosis, cuff cellulitis, urethral syndrome, pregnancy loss, preterm labour etc.

Hence, it is very important for microbiological diagnosis of abnormal vaginal discharge especially, when a patient is having recurrence or not responding to standard therapy. Hence it is very important to timely diagnose and manage abnormal vaginal discharge to prevent morbidity to women. Further studies are recommended to emphasize the role of microbiological diagnosis, as clinical diagnosis alone can lead to false interpretation.

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References

1. Bowler I, Griffeth L. Investigation and Management of Vaginal Discharge in Adult Women. OCCG, 2015.
2. Schwebke J. *Bacterial vaginosis*. Curr Infect Dis Rep. 2000;2(1):14-17.
3. Donder GG, Vereecken A, Bosmans E, De Keersmaecker A, Salembier G, Spitz B. Definition of a type of abnormal vaginal flora that is distinct from bacterial vaginosis: aerobic vaginitis. BJOG. 2002;109:34-43.
4. Mackie TJ, McCartney JE. Laboratory strategy in the diagnosis of infective syndromes. In: Collee JG, Fraser AG, Marmion BP, Simmons A, editors. Practical Medical Microbiology. 14th ed. Edinburg: Churchill living stone, 2006, 796p.
5. Schwebke JR, Hillier SL, Sobel JD, McGregor JA, Sweet RL. Validity of the vaginal gram stain for the diagnosis of bacterial vaginosis. Obstet Gynecol. 1996;88:573-6.
6. Guntoory I, Tamaraba NR, Nambaru LR. Prevalence and sociodemographic correlates of vaginal discharge among married women of reproductive age group at a teaching hospital. al. Int J Reprod Contracept Obstet Gynecol. 2017 Nov;6(11):4840-4846.

7. Patel V, Weiss HA, Kirkwood BR, Pednekar S, Nevrekar P, Gupte S, *et al.* Common genital complaints in women: the contribution of psychosocial and infectious factors in a population based cohort study in Goa; India. *Int J Epidemiol.* 2006;35:1478-85.
8. Patel V, Pednekar S, Weiss H, Rodrigues M, Barros P, Nayak B, *et al.* Why do women complain of vaginal discharge? A population survey of infectious and psychosocial risk factors in a South Asian community. *Int J Epidemiol.* 2005;34(4):853-862.
9. Choudhary V, Kumar R, Agrawal VK, Singh A, Narula R, Sharma M. Prevalence and Determinants of Vaginal Discharge among Women of Reproductive Age Group in Tertiary Care Hospital of Northern India. *Natl J Community Med.* 2012;3(4):661-5.
10. Masand DL, Patel J, Gupta S. Utility of microbiological profile of symptomatic vaginal discharge in rural women of reproductive age group. *J Clin Diagn Res.* 2015;9(3):QC04-QC07.
11. Fox KK, Behets FM. Vaginal discharge. How to pinpoint the cause. *Postgrad Med.* 1995;98:87.
12. Mohadani JW, Dekate RR, Shrikhande AV. Cytodiagnosis of discharge per vaginum. *Indian J Pathol Microbiol.* 1998;41:403-411.
13. Kamara P, Kong TH, Brathwaite A, *et al.* Vaginal infections in pregnant women in Jamaica: Prevalence and risk factors. *Int STD and AIDS.* 2000;11:516-520.
14. Koumans EH, Sternberg M, Bruce C, McQuillan G, Kendrick J, Sutton M, *et al.* The prevalence of bacterial vaginosis in the United States, 2001-2004; associations with symptoms, sexual behaviors, and reproductive health. *Sex Transm Dis.* 2007;34:864-9.
15. Pawanarkar J, Chopra K. Health and population – Prevalence of lower reproductive tract infection in infertile women. *Perspect Issues.* 2004;27:67-75.
16. Malls N, Gupta I, Mahajan RC. Human Trichomoniasis. *Indian J Med Microbiol.* 2001;19:6-13.
17. Khan N, Kausar R, Flach C, Howard L. Psychological and gynecological morbidity in women presenting with vaginal discharge in Pakistan, *International Journal of Culture and Mental Health.* 2012;5(3):169-181.
18. Venugopal S, Gopalan K, Devi A. Epidemiology and clinico- investigative study of organisms causing vaginal discharge. *Indian J Sex. Transm. Dis. AIDS.* 2017;38:1:69-75.
19. Lally P, Van Jaarsveld CH, Potts HW, Wardle J. How are habits formed: Modelling habit formation in the real world? *Eur J Soc Psychol.* 2010;40:998-1009.
20. Larsen B, Monif GRG. Understanding the Bacterial Flora of the Female Genital Tract. *J Infect. Dis.* 2001;32:e69-77.