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Original Article

Prevalence of Bacterial Vaginosis Using Amsel's Criteria In Reproductive Women attending Gynaecology OP At Government Maternity Hospital, Tirupati, Andhra Pradesh

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Abstract

Background: Vaginal discharge is the most common cause in reproductive women attending Gynaecology OP. Bacterial vaginosis is the most common cause of nonspecific vaginitis in the reproductive age group. The disease manifests as vaginal discharge with or without itching. It is associated with preterm labour, premature rupture of membranes and low birth weight in pregnancy. Early detection of the organisms and treatment is very difficult in our country due to lack of awareness and continuous follow up.

Methods: A prospective study was conducted on 300 women of reproductive age group attending Gynaecology OP at Government Maternity Hospital, Tirupati with a history of vaginal discharge over a period of one year from 2020 -2021 after obtaining approval from Institutional Ethics Committee. Diagnosis was made by history and Amsel's criteria.

Results: Among the study population, 105 (35%) participants had mucoid discharge, 60 (20%) participants had homogenous greyish white discharge, 54 (18%) participants had curdy white discharge, 54 (18%) participants had watery discharge and 27 (9%) with frothy discharge. A majority (21%) of women had Bacterial Vaginosis, followed by Candidiasis in 19%, Trichomonas vaginalis in 12%, mixed infections in 7% and no organisms in 41%.

Conclusion: Prevalence of vaginal discharge is more frequent in lower socio-economic status and rural areas. In the current study the most common cause of vaginal discharge is Bacterial Vaginosis followed by Candidiasis. Trichomonas vaginalis was the least.

Key words: Vaginal discharge, Bacterial vaginosis, Amsel's criteria

INTRODUCTION

In 1955 Herman Gardner and Dukes described foul smelling discharge in women as Non Specific Vaginitis, which is now called as Bacterial Vaginosis. It was called so because the causative agents are bacteria and there is no inflammatory response. Bacterial Vaginosis is an alteration of normal vaginal flora, that is the replacement of lactobacilli predominant vaginal flora by the other bacteria like Gardnerella Vaginalis, Mycoplasma and other Bacteroides species[1,2]. 90% of the cases are caused by Gram negative bacteria that is Gardnerella vaginalis[1]. As a result of this, pH increases and protection from overgrowth of other organisms is lost. It has been postulated that repeated alkalinisation of vagina which occurs due to frequent sexual intercourse or douching plays an important role in Bacterial Vaginosis. Prevalence of Bacterial Vaginosis is 53.1% among 21-30yrs age group and 28.1% among 31-40yrs age group. The most common cause of vaginal discharge among women of reproductive age is Bacterial Vaginosis[3]. Bacterial Vaginosis is a polymicrobial clinical syndrome resulting in the alteration of normal vaginal bacterial flora that results in the loss of H2O2 producing lactobacilli and overgrowth of other bacteria predominantly anaerobic bacteria. Anaerobic bacteria can be found in less than 1% of the flora of normal women. But in women with Bacterial Vaginosis, however

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the concentration of anaerobes and Gardnerella vaginalis and Mycoplasma hominis, is 100 to 1000 times higher than that in the normal women. Lactobacilli are usually absent[4].

Among non-pregnant women Bacterial Vaginosis is associated with pelvic inflammatory disease, Post operative cuff infections after hysterectomy, post-abortal pelvic inflammatory disease, abnormal cervical cytology, sexually transmitted infection. Risk of acquiring HIV is also increased in the presence of Bacterial Vaginosis. So, screening and early treatment of Bacterial Vaginosis is necessary before gynaecological surgery to prevent complications like pelvic inflammatory disease[5]. Recurrence and treatment failure is common unless it is diagnosed and treated. In pregnant women it is associated with complications like premature rupture of membranes, preterm birth, chorioamnionitis and post caesarean endometritis[4]. In women with Bacterial Vaginosis who are undergoing surgical abortion or hysterectomy, pre-operative treatment with metronidazole eliminates this increased risk.

In order to reduce all these complications there is a need to diagnose Bacterial Vaginosis early and start treatment. When there is high suspicion of Bacterial Vaginosis, Amsel's criteria is used as a diagnostic tool of choice. When detected and adequately treated, the cure rate can be as high as 80%, thus preventing further serious complications[6].

Amsel's Criteria

Any 3 of the following signs or symptoms are diagnostic[7].

- Homogenous thin grey-white vaginal discharge that adheres to the vaginal walls.
- Vaginal fluid pH >4.5 Positive Whiff test -On addition of 10% KOH to a drop of vaginal discharge,fishy odour occurs.
- Presence of clue cells (>20% of cells) - Clue cells - Many epithelial cells present with granular cytoplasm caused by small Gram negative bacilli adhering on their surface are called clue cells.

Clinicians who are unable to perform microscopy should use alternative diagnostic tests such as pH and amines test card, detection of Gardnerella vaginalis ribosomal RNA, or Gram stain. Specificity of Culture is very less. Therefore, culture of Gardnerella vaginalis is not recommended as a diagnostic tool[8]. We can hereby propose to use this clinical criteria for diagnosing Bacterial Vaginosis as it is rapid, economical, convenient and outpatient procedure.

OBJECTIVES

The objective of the study was to know about the prevalence of Bacterial Vaginosis among reproductive women attending Gynaecology OP with white discharge per vaginum at Government Maternity Hospital, Tirupati.

SUBJECTS AND METHODS

Study area

Government Maternity Hospital, Tirupati, Andhra Pradesh.

Study design

Prospective study

Study subjects

Reproductive women (21-40 years) attending Gynaecology OP with complaint of white discharge per vaginum.

Study duration

1 year from the date of approval from Institutional Ethical committee.

Inclusion Criteria

Non-pregnant women of reproductive age group (21-40), attending Gynaecology OPD

Exclusion Criteria

Pregnant women of reproductive age group, with associated skin diseases like lichen sclerosis, vulvar dermatoses etc.

Materials Required

- Sterile Cotton swabs
- Cusco's speculum
- Clean glass slides
- pH indicator strips
- Chemicals and reagents like normal saline, potassium hydroxide, gram staining reagents.
- Microscope

METHODS

A prospective study of 300 women of reproductive age attending gynaecology op complaining of vaginal discharge was conducted at Government Maternity Hospital, Tirupati for one year from 2020-2021 after institutional ethical committee approval. After explaining the study procedure to the patients, written and informed consent was taken from them. All identification details of patient like name, age, gender, marital status, parity and address were noted. Detailed history from patients regarding chief complaints like colour, odour, consistency of vaginal discharge, itching, dysuria, dyspareunia, lower abdominal pain, duration of complaints, drug intake, chronic illness etc were taken. Past history of having similar complaints and details of any treatment used was obtained. In menstrual history

Table 1: Sociodemographic factors

Age (Years)	Number of patients	Percentage (%)
21-25	64	21.3
26-30	106	35.3
31-35	90	30.0
36-40	40	13.3
Total	300	
Socioeconomic status		
Socioeconomic status	**Number of patients**	**Percentage (%)**
Lower (V)	132	44
Lower Middle (IV)	36	12
Middle (III)	96	32
Upper Middle (II)	27	9
Upper (I)	9	3
Total	300	100
Type of residence		
Residence	**Number of patients**	**Percentage (%)**
Rural	189	63
Urban	111	37
	300	100

Table 2: Contraceptive History

Contraceptive History	Number of patients	Percentage (%)
OCPs	12	4
Condom	15	5
IUCD	21	7
DMPA	6	2
None	246	82
Total	300	100

Table 3: Symptoms other than vaginal discharge

Symptoms	Number of Patients	Percentage (%)
Itching	128	42.7%
Foul Smell	83	27.7%
Dyspareunia	37	12.3%
Dysuria	36	12%
Lower Abdominal Pain	35	11.7%
No other symptoms	87	29%

Table 4: Types of white discharge

Type of Discharge	Number of Patients	Percentage (%)
Homogenous greyish white discharge	60	20
Curdy white discharge	54	18
Frothy discharge	27	9
Watery discharge	54	18
Mucoid discharge	105	35
Total	300	100

Table 5: Table vaginal pH

Vaginal pH	Number of patients	Percentage (%)
pH < 4.5	138	46
pH > 4.5	162	54
Total	300	100

Table 6: Whiff Test

Whiff Test	Number of patients	Percentage (%)
Positive	69	23
Negative	231	77
Total	300	100

Table 7: Amsel's Criteria

Component	Total no. of patients (N=63)	Percentage of patients
Thin homogenous greyish white discharge	51	81%
Vaginal PH >4.5	57	90.5%
Positive whiff test	47	74.6%
Clue cells+	41	65.1%

regularity of cycles and date of last menstrual period was noted. Treatment history regarding use of contraception, recent use of antibiotics, steroid therapy was obtained. General examination of patient was done. Patient was asked to empty the bladder and then she was made to lie in dorsal position. Cusco's speculum was gently introduced into the vagina to visualize the vagina and cervix and for the presence of abnormal discharge, cervical erosions. The colour, amount, consistency and odour of discharge were noted. After doing per speculum examination, vaginal pH was determined by using pH strips and vaginal discharge was collected with 2 cotton swabs from the posterior fornix. Out of two swabs, one was used for Saline Wet mount examination and another swab was sent to the microbiology for Gram staining. Gram staining was done to know the presence of bacteria other than lactobacilli, as a supportive evidence for clinical criteria. Whiff test was done using discharge collected on the speculum. Then bimanual examination was done for assessing uterine size, position, mobility and condition of adnexa. Final interpretation was based on Amsel's criteria as an outpatient procedure.

RESULTS

The present study was a prospective study conducted on 300 women of reproductive age group (21-40 years) attending gynaec opd at Government Maternity Hospital, Tirupati for one year from 2020 to2021.The following results were analysed [Table 1].

106 (35.3%) women were aged between 26-30 years, 90 (30%) participants were aged between 31-35 years ,64 (21.3%) were aged between 21-25 years, and 40 (13.3%) were aged between 36-40 years. 132 (44%) women

belonged to lower socio-economic status, 96 (32%) were from middle socio-economic status, 36 (12%) were from lower-middle socio-economic status and 27 (9%) were from upper-middle socio-economic status. 189 (63%) women were from rural areas and 111 (37%) women were from urban areas[Table 2].

246 (82%) women did not use any contraceptive method. 21 (7%) couples used Condom, 15 (5%) women had IUCD for contraception,12 (4%) women used OCPs and 6 (2%) women used DMPA injection for contraception [Table 3].

128 (42.7%) women had itching, 83(27.7%) women had foulsmell, 37 (12.3%) women had dyspareunia, 36 (12%) women had dysuria,35 (11.7%) women had lower abdominal pain, and 87 (29%) women had no other symptoms except white discharge per vaginum [Table 4].

On examination, 105 (35%) participants had mucoid discharge, 60 (20%) women had homogenous greyish white discharge, 54 (18%) women had curdy white discharge and 27 (9%) women had frothy discharge [Table 5].

162 (54%) women had vaginal pH >4.5 and 138 (46%) women had vaginal pH <4.5% [Table 6].

69 (23%) women had Whiff test positive and 231 (77%) women had Whiff test negative [Table 7].

51 (81%) women had thin homogenous greyish white discharge, 57 (90.5%) women had vaginal pH >4.5, 47 (74.6%) women had whiff test positive and in 41 (65.1%) women clue cells were detected.

DISCUSSION

Vaginal discharge is the most common presenting symptom seen in the reproductive women. One among ten females suffer from vaginal discharge in a year. The present study was a prospective study conducted on 300 women between 21-40 years attending Gynaecology OPD, Government Maternity Hospital Tirupati from 2020-2021. In the present study 106 (35.3%) patients were aged between 26-30years, followed by 90 (30%) were aged between 31-35 years, 64 (21.3%) were aged between 21-25 years and 40 (13.3%) were aged between 36-40 years. A Prospective study conducted by Basanta Kumar Pati *et al*.,[9] in 100 women of reproductive age group during the period September 2012 to September 2014, found most subjects were aged between 26-35 years. This study was similar to current study. In our study, about 44% of the study population belonged to lower socio- economic status, followed by 32% in the middle socio-economic status, 12% in the lower-middle socio-economic status, 9% in the upper-middle socio-economic status and 3% in the upper socio-economic status. Majority 63% participants were from rural areas and 37% participants were from urban areas. Contrary to study conducted in Yemen, 89.3% patients were from urban residence and 10.7% were from rural area[10].

Lack of awareness and education on hygiene leading to poor personal genital hygiene among lower socio-economic status women could be the reason significant proportion of white vaginal discharge in women belonging to lower socio- economic class.

In the current study, 7% had IUCD as the method of contraception, 5% were using condom for contraception,4% were using OCPs for contraception and 2% were using DMPA injection as a contraceptive measure. Guntoory I *et al*.,[11] conducted a study and found the least occurrence vaginal discharge in females using oral contraceptives and greater among women with permanent sterilization which is in our present study and parallel to Pant B *et al*.[12]

The most common clinical symptom in the present study was vulvar itching in 42.7%, followed by foul smelling discharge in 27.7%, dyspareunia in 12.3%, Dysuria in 12% and lower abdominal pain in 11.7%. In a study conducted by Vijayalakshmi *et al*.,[13] in between September 2009 to September 2011 revealed majority of the study subjects presenting with itching in 33.5% followed by backache in 29%, dyspareunia in 15.5%, urinary symptoms in 11%, abdominal pain in 10%, prolapse in 1% which is comparable to the present study results. Agarwal *et al*., found that majority of participants were presented with abdominal pain 48%, followed by itching in 38%, dysuria in 27.3%, dyspareunia in 18.6% and post-coital bleeding in 9.1%.

In the current study, 105 (35%) patients had mucoid discharge, 60 patients (20%) had homogenous greyish-white discharge, 54 (18%) had curdy white discharge, 27 (9%) had frothy discharge, 54 (18%) had clear watery discharge, A descriptive observational study was conducted by Masand *et al*.,[14] in 100 sexually active nonpregnant women of reproductive age group (18-45 years) between June 2012 to December 2013 at Jaipur, Rajasthan, and the results were homogenous white discharge in 52%, followed by mucopurulent in 23%, curdy white discharge in 17%, yellowish-green discharge in 8%.

In the present study, women with Bacterial Vaginosis, In 63 patients, all 4 components of Amsel's clinical criteria were present in 10 women and only 3 components were present in 53 women. Presence of any 3 components of Amsel's criteria is sufficient to diagnose Bacterial Vaginosis. In the current study prevalence of bacterial vaginosis was 21%

based on Amsel's criteria. Among women with Bacterial Vaginosis (n=63), the mean age group is 29.3 + 4.07. Majority of women 28.8% belonged to lower SES (class V), followed by upper SES (class I) 22.2%, middle SES (class III) 17.7%, lower middle SES (class IV) and upper middle SES (class II) 3.7%. Majority of women (30.6%) were from rural areas and 15.3% are from urban areas. Among women with Bacterial Vaginosis, 19.04% (12), 15.87% (10), 1.58% (1), 1.58% (1) participants had risk factors like douching, IUCD in-situ, Diabetes, Hypertension respectively and 60.31% (38) participants had no risk factors.

Sensitivity and Specificity of each component of Amsel's criteria such as homogenous grey-white discharge was 81% and 96.2%, vaginal pH > 4.5 was 90.5% and 55.7%, Clue cells on wet mount was 68.3% and 96.6%, positive whiff test were 74.6% and 90.7% respectively. According to the present study, Vaginal pH was the most sensitive and clue cells on wet mount was the most specific components of Amsel's criteria.

K Pavani, K Saileela[15] conducted a study on 204 patients of 18-45years age group with abnormal vaginal discharge at Kamineni Institute, Nalgonda. They compared the accuracy between Amsel's clinical criteria and culture with Nugent's scoring system in diagnosing Bacterial Vaginosis. According to this study sensitivity, specificity of Amsel's criteria was 78.7%, 92.9% respectively. It showed the prevalence of Bacterial Vaginosis as 24% by Amsel's criteria, 23% by Nugent scoring system and 15% by culture.

Women having symptoms other than vaginal discharge is also have significant association with Bacterial Vaginosis than women not having any other symptom apart from vaginal discharge. ($p<0.05$; significant).

Sensitivity and Specificity of each component of Amsel's criteria, homogenous grey-white discharge is 81% and 96.2%, vaginal pH > 4.5 is 90.5% and 55.7%, Clue cells on wet mount is 68.3% and 96.6%, positive whiff test are respectively. According to the present study, vaginal pH is the most sensitive and clue cells on wet mount is the most specific components of Amsel's criteria.

CONCLUSION

In the present study which included 300 women, prevalence of vaginal discharge more frequent in women belonging to low socio-economic group coming from rural areas. In the current study the most common cause of vaginal discharge was Bacterial Vaginosis followed by Candidiasis followed by Trichomonas vaginalis. Bacterial Vaginosis by Amsel's criteria is simple, quick, economical and Outpatient Day procedure. There is a need for community awareness about healthcare facilities and self-concern in women.

Limitations and Recommendations

- Smaller sample size and hospital-based study were the significant limitations of the present study. Only women with white discharge were included in the study. Asymptomatic women were not included.
- This leads to the selection bias in the study.
- Therefore, the results cannot be applied to the whole population.
- The study recommends that Amsel's criteria can be used for early diagnosis for bacterial vaginosis which may lead to many complications if left untreated.
- It recommends creating community awareness about health care facilities for this purpose.

ETHICS COMMITTEE APPROVAL

This journal article has been approved by the institutional ethical committee.

INFORMED CONSENT

Informed consent was obtained by participants of the present study.

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