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Clinico-Microbiological Study of Symptomatic Vaginal Discharge

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A B S T R A C T

Abnormal vaginal discharge is the most common gynaecological symptom in reproductive age group(15-45 years). It's prevalence in India is 30%. Aetiological agent of vaginitis can be bacterial, fungal or parasitic. It causes significant morbidity like pelvic inflammatory disease(PID), infertility, pregnancy loss, preterm labour, increased risk of other STDs to mention a few. Hence, the present study was undertaken to unravel the specific etiological agents and their sensitivity pattern. Totally, 200 high vaginal swabs from clinically suspected vaginitis cases were subjected to saline-wet mount, pH-estimation, Gram stain, Methyl-violet stain, KOH-mount and whiff/amine test. Samples were cultured aerobically. Organisms were identified with their antibiotic sensitivity pattern. Most common cause was Aerobic-vaginitis(32%). Commonest organisms were *E.coli, P.aeruginosa* and *S.aureus*. Many were sensitive to amikacin except for *P.aeruginosa* which were sensitive to imipenem and colistin. Vulvovaginal-candidiasis, Bacterial-vaginosis and Trichomoniasis were seen in14.5%, 14% and 6.5% of our cases respectively. All vaginal discharge cases should be considered for rapid microbiological examination like Saline-wet mount, Gram stain, KOH-mount and Whiff test. The diagnosis should be confirmed by identification and it's susceptibility pattern for specific treatment to avoid above complications.

Introduction

Symptomatic vaginal discharge due to vaginitis is the frequent complaint encountered every other day both by gynaecologists and general practitioners. 1-14% of women in the reproductive age group suffer from vaginitis and it accounts for 5-10 million OPD visits per year all over the world. In India, among the females of reproductive age group its prevalence is estimated to be 30% (Rekha *et al*., 2010).

Vaginitis is a diagnosis based on the presence of symptoms of abnormal discharge, vulvovaginal discomfort or both. Small amount of discharge flows from the vagina daily as the body's way of maintaining a normal healthy environment. Normal discharge is usually clear with no malodour. Change in amount, colour, odour, irritation, itching or burning could be due to an imbalance of healthy bacteria in the vagina, leading to vaginitis (Gor *et al*., 2013).

Few morbid conditions like PID, infertility, endometriosis, cuff-cellulitis, urethral syndrome, pregnancy loss, preterm labor can be predisposed by abnormal vaginal discharge (Rekha *et al*., 2010).

Results from many different studies performed in order to establish the frequency of the infectious agents for vaginitis have varied widely. The ranges found for Bacterial-vaginosis have varied between 8% & 75%; Aerobic-vaginitis between 7.9% (Donders *et al*., 2002) & 51% (Jahic *et al*., 2013); Vulvovaginal-Candidiasis has presented rates between 2.2% & 30% & Trichomoniasis between zero & 34%(Adad *et al*., 2001); yet 7-72% of women with vaginitis may remain undiagnosed. Precise diagnosis may be difficult to identify, but care must be taken to differentiate these conditions from other infectious and non-infectious causes (Gor *et al*., 2013).

Successful management of symptomatic vaginal discharge lies in the diagnostic approach. In most situations, a presumptive diagnosis is made based on nature of discharge (clinical diagnosis), which is often incomplete. Thus, elimination of laboratory component (microbiological diagnosis) has led to treatment mismanagement, giving rise to over or under treatment, increase in recurrence rates, and increase in resistant strains of the etiological agents as well. Conventional approach for the diagnosis is through microbiological diagnosis of the aetiological agent(s). This is vitally necessary for proper management of the condition (Rekha *et al*., 2010).

Hence, the present study was conducted to identify specific aetiological agents causing vaginitis, by simple & rapid methods which further leads to appropriate treatment of the condition.

Materials and Methods

It's a prospective study, where high vaginal swabs from 200 clinically suspected vaginitis cases were processed for the identification of causative organism(s) over a period of one year, attending the Gynaecology clinic of rural tertiary care hospital, South India, Karnataka.

Institutional ethical committee clearance was taken. Samples were collected after obtaining written informed consent from the patients.

Inclusion Criteria: Patients in reproductive age group with symptomatic vaginal discharge.

Exclusion Criteria: Patients in whom per speculum and pelvic examination was not possible**,** who were menstruating**,** who were on antimicrobials/antifungals(topical/oral)**,** pregnant women**,** postmenopausal patients**,** post hysterectomy patients and who were in post-partum period.

A complete medical history was taken which included age, address, presenting complaints(type of discharge, odour, associated pain etc.), history of present illness, predisposing factors, previous history of treatment, past history, obstetric history and occupational history.

The vaginal discharge was collected from the posterior fornix and lateral vaginal wall with cotton tipped sterile swabs. These specimens were further subjected to various tests for identification of the organisms causing vaginitis (Collee *et al*., 2007). Oedema, inflammation of vaginal wall, vaginal ulcerations and nature of the vaginal discharge (*i.e.* colour, odour, consistency) were observed (Money *et al*., 2005).

The various tests done were, pH estimation using pH (Qualigens) paper, saline-wet mount, KOH preparation(Amine/Whiff test & KOH mount). Gram stain & Methyl violet stain was done. Sample cultured on Blood Agar, MacConkey's Agar and Sabouraud dextrose agar for aerobic bacterial and fungal cultures (El-Din *et al*., Khamees *et al*., 2012) Aerobic bacteria grown were identified by conventional methods (Collee *et al*., 2007).

Antibiotic sensitivity of aerobic bacterial isolates was performed on Mueller Hinton agar(MHA) plates by standardized Kirby Bauer disc diffusion technique as per the CLSI guidelines (CLSI, 2013).

Statistical Analysis: Pearsons' Chi square test and Fischers' Exact test was used.

Results and Discussion

All our patients were from Out Patient Department of Gynaecology. Study group included women in the reproductive age group.

Maximum number of cases fell in the age group of 36-40years (55, 27.5%), followed by 31-35years (49, 24.5%), 26-30years (47, 23.5%), 21-25years (32, 16%) and 41-45years (14, 7%) The least number of cases were detected in the age group of 15-20years (3, 1.5%). Out of 200 cases, 197 were married.

Most of our cases 127(63.5%) had 2 children, followed by 1 child in 44(22%), 3 children in 20(10%), no children in 8(4%) and 5 children in 1(0.5%) case.

Among 200 cases studied most of them were housewives 74(37%), followed by agriculturists 54(27%), construction workers 45(22.5%), house maids 13(11.5%) and office workers 4(2%) by occupation.

Most common method of contraception practiced among the study group was tubal sterilization 63(31.5%), followed by Intra-uterine Contraceptive devices 52(26%), Oral contraceptive pills 46(23%) and barrier contraception 26(13%).

All our cases presented with vaginal discharge, 44(22%) of them presented with pruritus, 43(21.5%) pain in lower abdomen and 30(15%) foul smelling vaginal discharge.

68(34%) of them gave the history of recurrence, 19(9.5%) history of abortion and 15(7.5%) history of Diabetes mellitus.

pH strip examination of vaginal discharge showed 101(50.5%) cases with pH less than 4.5 and 99(49.5%) of them more than 4.5.

Saline wet mount showed fungal elements and motile trichomonads in 29(14.5%) and 13(6.5%) cases respectively.

KOH-mount showed fungal elements in 29(14.5%) cases where as Whiff test/ amine test was positive in 28(14%) cases.

Methyl-violet staining done to demonstrate Trichomonads showed positive results in 13(6.5%) cases.

Only 2 strains of *P.mirabilis* were isolated which were uniformly sensitive to almost all antibiotics tested.

Present study consists of females in reproductive age group. Mean age in our study was 32.49 years which is similar to previous studies (Cook RL *et al*., 1992; Jahic M *et al*., 2013; Thulkar J *et al*., 2010; Hemalatha *et al*., 2013; Jahic M *et al*., 2013)

The present study revealed that 101 cases were with median parity 2, of which around 50% had vaginitis. Similarly (Hemalatha *et*

al., 2013) has also revealed maximum cases with maternal parity 2.

37% of our cases were housewives, with primary education, around 61% were illiterate and only around 2% were literate and were office workers. This is comparable to the work done by (Rahman *et al*., 2013) where they also observed 60% illiteracy among the study group. As ours is a rural hospital, majority of them were illiterates. It is lack of education which makes them ignorant about the facilities available in hospital. Due to their busy schedule they fail to approach health care system on time resulting in complications. Thulkar *et al*., 2010 observed around 38.8% of tubal sterilization which is almost comparable to our study that is around 32%.

Once women are sterilized, they stop using barrier contraceptives and are prone to various STDs. Unhygienic factors may also be possible explanation for the increase in vaginal infection rates. Counselling about good hygiene and proper menstrual care may help in prevention of recurrence. In India, National AIDS Control Program launched in 1987, started promoting condom for prevention of AIDS and other STDs. But still condom use is more for prevention of pregnancy rather than prevention of STDs and recurrent vaginitis (Thulkar *et al*., 2010)

Table-9 shows occurrence predisposing factors like DM, abortion and recurrences in the study groups. DM can be considered as one of the predisposing factors which varied between 7 and 30%, whereas history of abortion and history of recurrence can be considered as complications of persistent vaginitis which varied between 9 to 60% and 5 to 50% respectively, and our results are within agreeable limit. The p value for all 3 parameters are <0.01, <0.001and <0.01 which are highly significant.

Assessment of intra-vaginal pH is of great help, but often neglected procedure that can be used to evaluate vaginal health (Hemalatha *et al*., 2013). Vaginal pH plays a critical role in maintaining normal flora, hence even a slightest variation will reflect in the change of flora which finally results in various types of infections. We have observed 50% of pH less than 4.5 and rest more than 4.5 which is well correlated with other studies (Aggarwal *et al*., 2003; Rekha *et al*., 2010; Fule *et al*., 2012; Verma *et al*., 2013; Jahic *et al*., 2013; Hemalatha *et al*., 2013).

Saline wet mount is the most cost-effective diagnostic test (Garber *et al*., 2005) We observed 14.5% and 6.5% of fungal elements and motile Trichomonads respectively. Other studies observed Trichomonads in around 10 to 20% of the cases (Clay *et al*., 1998; Rekha *et al*., 2010; Fule *et al*., 2012; Rahman *et al*., 2013) In a study done by Rahman *et al*., 2013 they reported around 10% of fungal elements in the wet mount.

In 14.5% of our cases KOH mount was positive for fungal elements which was almost similar to the study done by Samia S Khamees *et al*., 2012.

Positive amine test was observed in 14% in our study, whereas it varied from 7 to 57% in various studies (Donders *et al*., 2002; Fule *et al*., 2012; Khamees *et al*., 2012; Rahman *et al*., 2013; Hemalatha *et al*., 2013; Jahic *et al*., 2013) Whiff test seems less practical and requires a good sense of smell. However, inclusion of whiff test along with pH value may improve the specificity of provisional diagnosis (Hemalatha *et al*., 2013). Presence of clue cells is very characteristic of BV which was observed in 14% of our cases (p value – <0.001, highly significant) whereas it was observed in

58.9% of cases in a study done by Hemalatha *et al*., Hemalatha *et al.*, have quoted 95% sensitivity and 90% specificity for clue cells in the diagnosis whereas our study showed 100% specificity and sensitivity. Presence of clue cells was correlating with Nugent score and amine/whiff test results.

Analysing the Nugent score which is useful for rapid diagnosis of BV(Money *et al*., 2005), our study was comparable to other studies except in the range of 4-6. We have observed 40.5% cases in 0-3 score, 32% cases in 4-6 score and 14% cases in 7-10 score. Whereas other studies showed 56% in 0-3 score, 5 to 20% in 4-6 score and 14 to 24% cases in 7-10 score (Modak *et al*., 2011; Mohanty *et al*., 2010).

An attempt was made to observe Trichomonas under Gram stain and Methyl-violet stain (Fowler *et al*., 1952). We observed aerobic vaginitis in 50.5% of the cases, but its frequency varied between 28 to 90% in other studies (Khan *et al*., 2004; Khamees *et al*., 2012; Jahic *et al*., 2013) We observed 14.5% of culture positive VVC while in other studies there is an uniform occurrence of Candidal infection from about 11 to 35% (Khan *et al*., 2004, El-Din *et al*., 2009; Khamees *et al*., 2012; Jahic *et al*., 2013) Our results are well within this range.

Although a positive yeast culture may represent a woman who is asymptomatically colonized, addition of vulvovaginal symptoms yields the correct diagnosis in approximately 90% of women (Nyirjesy *et al*., 2008).

In the present study, we observed 67% of pathogens, 32% of AV, 14.5% of VVC, 14% of BV and 6.5% of TV. 18.5%(37 cases) of CONS (non-pathogens) which are often considered as commensals (Lakshmi *et al*., 2012).

Table-10 shows various organisms isolated which include pathogens and commensals. We observed the occurrence of *E.coli* in 18.6%; it appears to be highest among all studies published varying between 13 and 21%. The role of *E.coli* in vaginitis is very controversial and is one of the main causes of neonatal sepsis and chorioamnionitis (Jahic *et al*., 2013).

The presence of *K.pneumoniae* in 9.3% of our cases of vaginitis can be attributed to taking of antibiotics by infected women (beta-lactam antibiotics), while *Klebsiella* isolates are considered the most common resistant bacteria to most antibiotics by producing extended spectrum beta lactamase. It can also be attributed to absence or decrease in numbers of lactobacilli due to over the counter drug usage and subsequently their defence factors (Razzak *et al*., 2011).

We observed around 12% of *P.aeruginosa*, its incidence varied from 2-9% and ours is on the higher side.

Among Gram positive pathogen, *S.aureus* is also the common pathogen encountered (10.2% cases). It has been reported by various workers from 2-46% of cases with AV. *S.aureus* is one of the most persistent pathogens of humans (Mumtaz *et al*., 2008).

Out of 11 *S.aureus* isolates 6 were MRSA tested by Cephoxitin disk test.

Our antibiotic sensitivity pattern is in agreement with the other study. With regards to notorious *P.aeruginosa*, all our 13 strains have slightly lower percentage of sensitivity as compared to other study (Mumtaz *et al*., 2008).

In the present study 75% of *Acinetobacter spp.* were sensitive to commonly used antibiotics. Among 2 *P.mirabilis,* both were

sensitive to commonly used antibiotics except one was resistant to Cotrimoxazole. Antibiotic sensitivity pattern for *Acinetobacter spp*. and *P.mirabilis* cannot be commented upon due to less number of isolates.

Table.1 Distribution of Nugent score among cases studied.

Score	No. of cases
0-3	81(40.5%)
4-6	64(32%)
7-10	28(14%)
Not applicable	27(13.5%)

Table.2 Organisms isolated

Organism isolated	Single	Mixed	Total
E.coli	13	7	20
P.aeruginosa	9	4	13
S.aureus	9	2	11
Enterococcus spp.	6	4	10
K.pneumonia	8	2	10
Acinetobacter spp.	4	-	4
P.mirabilis	2	-	2
Non albicans candida	14	2	16
C.albicans	10	3	13
Coagulase Negative Staphylococci(CONS)	37	-	37

Table.3 Distribution of Mixed isolates.

Organisms	No. of cases(18)
T.vaginalis & Enterococcus spp.	3
T.vaginalis & P.aeruginosa	2
T.vaginalis & Bacterial vaginosis	1
T.vaginalis & C.albicans	1
T.vaginalis & S.aureus	1
Bacterial-vaginosis &*E.coli*	3
C.albicans & E.coli	1
C.albicans & P.aeruginosa	1
Non albicans Candida & *K.pneumoniae*	1
Non albicans Candida & *S.aureus*	1
E.coli & P.aeruginosa	1
E.coli & K.pneumonia	1
E.coli & Enterococcus spp.	1
Total	18

Table.4 Distribution - types of vaginal infection.

Diagnosis	**No. of cases**
Aerobic vaginitis(AV)	51(25.5%)
Bacterial vaginosis(BV)	24(12%)
Vulvovaginal candidiasis(VVC)	24(12%)
Trichomoniasis(TV)	5(2.5%)
Mixed(AV & TV)	6(3%)
Mixed(AV & VVC)	4(2%)
Mixed(AV & AV)	3(1.5%)
Mixed(AV & BV)	3(1.5%)
Mixed(TV & BV)	1(0.5%)
Mixed(TV & VVC)	1(0.5%)
Normal	78(39%)

Table.5 Antibiotic sensitivity pattern of Gram positive cocci

Antibiotics	***S.aureus(11)***		***CONS(37)***		***Enterococcus spp (10)***	
	Sensitive	**Resistant**	**Sensitive**	**Resistant**	**Sensitive**	**Resistant**
Ampicillin(AMP)	4(36.3%)	7(63.6%)	21(56.7%)	16(43.2%)	8(80%)	2(20%)
Cefoxitin(CX)	5(45.4%)	6(54.5%)	26(70.2%)	11(29.7%)	-	-
Cefalexin(CN)	5(45.4%)	6(54.5%)	26(70.2%)	11(29.7%)	-	-
Erythromycin(E)	8(72.7%)	3(27.2%)	29(78.3%)	8(21.6%)	5(50%)	5(50%)
Clindamycin(CD)	8(72.7%)	3(27.2%)	28(75.6%)	9(24.3%)	-	-
Gentamicin(GEN)	9(81.8%)	2(18.1%)	26(70.2%)	11(29.7%)	-	-
Ciprofloxacin(CIP)	8(72.7%)	3(27.2%)	24(64.8%)	13(35.1%)	-	-
Amikacin(AK)	11(100%)	0(0%)	27(72.9%)	10(27.0%)	5(50%)	5(50%)
Ceftriaxonen(CTR)	-	-	-	-	8(80%)	2(20%)
Gatifloxacin(GAT)	-	-	-	-	8(80%)	2(20%)
Azithromycin(AZM)	-	-	-	-	9(90%)	1(10%)
High Level Gentamicin (HLG)	-	-	-	-	10(100%)	0(0%)

Table.6 Antibiotic sensitivity pattern of Gram negative bacilli

Antibiotics	***Acinetobacter spp (4)***		***E.coli(20)***		***K.pneumoniae(10)***	
	Sensitive	**Resistant**	**Sensitive**	**Resistant**	**Sensitive**	**Resistant**
Amoxyclav(AMC)	1(25%)	3(75%)	10(50%)	10(50%)	5(50%)	5(50%)
Gentamicin(GEN)	3(75%)	1(25%)	10(50%)	10(50%)	8(80%)	2(20%)
Amikacin(AK)	3(75%)	1(25%)	18(90%)	2(10%)	10(100%)	0(0%)
Ceftriaxone(CTR)	3(75%)	1(25%)	10(50%)	10(50%)	4(40%)	6(60%)
Cotrimoxazole(COT)	3(75%)	1(25%)	4(20%)	16(80%)	8(80%)	2(20%)
Sparfloxacin(SPX)	2(50%)	2(50%)	5(25%)	15(75%)	7(70%)	3(30%)
Cefotaxime(CTX)	3(75%)	1(25%)	9(45%)	11(55%)	5(50%)	5(50%)

Table.7 Antibiotic sensitivity pattern of *P.aeruginosa* (n=13).

Antibiotics	**Sensitive**	**Resistant**
Amoxyclav(AMC)	7(53.8%)	6(46.1%)
Gentamicin(GEN)	4(30.7%)	9(69.2%)
Ciprofloxacin(CIP)	9(69.2%)	4(30.7%)
Amikacin(AK)	6(46.1%)	7(53.8%)
Ceftriaxone(CTR)	4(30.7%)	9(69.2%)
Cotrimoxazole(COT)	6(46.1%)	7(53.8%)
Sparfloxacin(SPX)	6(46.1%)	7(53.8%)
Cefoperazone/Sulbactam(CFS)	7(53.8%)	6(46.1%)
Piperacillin/Tazobactam(PIT)	9(69.2%)	4(30.7%)
Ceftazidime(CAZ)	7(53.8%)	6(46.1%)
Meropenem(MRP)	4(30.7%)	9(69.2%)
Ceftriaxone/Tazobactam(CIT)	6(46.1%)	7(53.8%)
Tobramycin(TOB)	3(23.0%)	10(76.9%)
Imipenem(IMP)	12(92.3%)	1(7.69%)
Colistin(CL)	13(100%)	0(0%)

Table.8 Comparison of various clinical features.

Studies	**Clinical features**		
	Pain abdomen	Pruritus	Foul odour
Gilbert G G Donders *et al*., 2002	6.2%	20%	8%
A Aggarwal *et al*., 2003	-	-	52.5%
S Rekha *et al*., 2010	-	20%	-
Varsha Chaudhary *et al*., 2012	54.3%	25%	-
Rita Elizabeth Moreira Mascarenhas *et al*., 2012	9.1%	19.1%	-
Aruna Verma *et al*., 2013	73%	-	17%
R Hemalatha *et al*., 2004	-	-	43.5%
Mahira Jahic *et al*., 2013	-	72.54%	29.94%
Present study	21.5%	22%	15%

Table.9 Comparison of predisposing factors in different studies.

Studies	**H/o Diabetes mellitus**	**H/o Abortion**	**H/o Recurrence**
Marcia Edilaine Lopes Consolaro *et al*., 2004	-	-	5.6%
Al-Zahraa Karam El Din *et al*., 2009	28.9%	-	-
S Rekha *et al*., 2010	-	-	42%
Varsha Chaudhary *et al*., 2012	-	19.2%	-
Rahman D *et al*., 2013	-	52%	-
Deepa Babin *et al*., 2013	8.6%	-	-
Aruna Verma *et al*., 2013	-	64.2%	-
Present study	7.5%	9.5%	34%

Table.10 Comparison of pathogens causing Aerobic vaginitis in various studies.

Studies	Khan *et al*., 2004	Mumtaz *et al*., 2008	Razzak *et al*., 2011	Lakshmi *et al*., 2012	Khamees *et al*., 2012	Present study
E.coli	21%	13.67%	16.2%	15.2%	13.83%	18.6%
P.aeruginosa	2%	7.25%	8.1%	-	9.57%	12.1%
S.aureus	2%	46.1%	18.9%	8.7%	21.28%	10.2%
Enterococcus spp.	31%	9%	-	6.5%	11.7%	9.3%
K.pneumoniae	3%	10.5%	8.1%	0%	13.48%	9.3%
Acinetobacter spp.	-	1.36%	6.8%	-	1.06%	3.7%
P.mirabilis	-	1.36%	-	-	5.32%	1.8%
CONS	7%	-	-	21.7%	-	34.5%

Table.11 Comparison of Antibiotic sensitivity pattern of GPC

Antibiotics	*S.aureus*		*Enterococcus spp.*	
	Mumtaz *et al*., 2008	Present study	Mumtaz *et al*., 2008	Present study
Ampicillin	26.3%	36.3%	63.8%	80%
Ciprofloxacin	65.51%	72.7%	-	-
Gentamicin	67.6%	81.8%	43.5%	100%
Amikacin	76.9%	100%	-	-
Methicillin/ Cephoxitin	69.3%	54.5%	-	-

Table.12 Comparison of Antibiotic sensitivity pattern of GNB

Antibiotics	*E.coli*		*K.pneumoniae*	
	Mumtaz *et al*., 2008	Present study	Mumtaz *et al*., 2008	Present study
Amoxycalv	46.8%	50%	60.29%	50%
Cephotaxime	73.9%	45%	79.1%	50%
Gentamicin	65.4%	50%	62.8%	80%
Amikacin	81.3%	90%	-	100%
Cotrimoxazole	21.5%	20%	61.8%	80%

Summing up all the AV cases aerobic bacterial pathogens were isolated from 32% of the cases, but in various studies it ranged between 24 and 51% and our study is within the acceptable limits (Rekha *et al*., 2010; Jahic *et al*., 2013).

A total of 29 Candida species isolated in our study, of which 13(45%) were *C.albicans* and 16(55%) were Non albicans Candida. Other studies revealed 35.5 to 54.9% of *C.albicans* and 45.1 to 64.4% of Non albicans Candida spp. There is a gradual increasing trend of Non albicans Candida VVC. It is important to emphasize that in the past 3 decades there has been an increasing percentage of infections caused by non-albicans Candida spp., particularly *C.tropicalis, C.glabrata* and *C.krusei* and are resistant to conventional therapy (Babin *et al*., 2013; El-Din *et al*., 2009)

Summarizing the various pathogens observed in studies over 10 years, BV has varied from 6.6% to 75%, (Verma *et al*., 2013; Mohanty *et al*., 2010; Rekha *et al*., 2010; Modak *et al*., 2011; Khamees *et al*., 2012; Rahman *et al*., 2013; Jahic *et al*., 2013; Hemalatha *et al*., 2013) ours is around 14%. VVC is ranging between 4.8% and 39.5%, (Verma *et al*., 2013; Rekha *et al*., 2010; Khamees *et al*., 2012; Lakshmi *et al*., 2012; Rahman *et al*., 2013; Jahic *et al*., 2013) ours is 14.5% which is also well within the stated range. There is a uniform occurrence of TV from about 2% -10% in almost all the studies, (Verma *et al*., 2013; Rekha *et al*., 2010; Khamees *et al*., 2012; Lakshmi *et al*., 2012; Jahic *et al*., 2013) ours is around 6.5% which a significant number. With respect to AV, only 2 studies have quoted which varied from 24 to 51% (Rekha *et al*., 2010; Jahic *et al*., 2013) and ours is 32% which is acceptable.

Hence, for the confirmation of all provisional diagnosis, microbiological assistance is necessary. A proper diagnosis will lead to proper management and avoid complications like recurrence, resistance, abortion, PID, cuff cellulitis, chorioamnionitis, PROM etc. It is mandatory to diagnose all the cases of vaginal discharge with laboratory techniques and Antibiotic sensitivity testing.

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