

Original Research Article

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Microbial Profile of High Vaginal Swab from Women of Reproductive Age Group in a Tertiary Care Hospital

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ABSTRACT

Bacterial vaginosis, candidiasis and trichomoniasis, along with sexually transmitted infections are the common vaginal infections in women of reproductive age group in developing countries. Here the normal vaginal flora, consisting of peroxide-producing lactobacilli, are replaced by *Gardnerella vaginalis*, *Mycoplasma hominis*, *Mobiluncus* species, and anaerobic gram-negative rods. ¹In the pregnant state microbial infections can lead to premature rupture of membranes which in turn can cause infant morbidity and mortality due to infections. Early detection and appropriate antimicrobial therapy can be life-saving by preventing vertical transmission of the pathogens. To find out the Microbiological profile of high vaginal swabs (HVS) from patients with various lower genital tract symptoms in the reproductive age group, attending the Obstetrics and Gynaecology Department at Sree Avittam Thirunal Hospital (SATH), Thiruvananthapuram, Kerala, South India. A hospital based study was done on 1315 high vaginal swabs collected during a period of two years, from May 2015 to April 2017. The samples were cultured aerobically on Blood agar (BA), Chocolate agar (CA) and MacConkey agar (MA) for microbial isolation. The overall positivity for pathogenic aerobic microbes was 234 (18%), while 1081 (82%) grew normal vaginal flora. *Candida* was the predominant pathogen in 125 (53%) patients. In this study there was a significantly high rate of detection of *Candida* species when compared to bacterial isolates. This justifies the practice of empirical antifungal therapy without taking high vaginal swabs in patients with complaints of vaginal discharge or related symptoms especially in the Gynaecology OPD. The detection of pathogens in HVS culture and its appropriate treatment in symptomatic pregnant women is also necessary for a full term normal pregnancy, child birth and a healthy baby.

Keywords

HVS (high vaginal swab), Vaginal infection, Candidiasis, Aerobic culture, Genital tract pathogens.

Article Info

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Introduction

The normal vaginal pH in women of reproductive age group is acidic (≤ 4.5). This usually protects the vagina from the common pathogenic infections. *Lactobacillus* is a commensal in the vagina in abundant numbers. This bacillus maintains the acidic pH in the vagina by the production of lactic acid. The proportion of *Lactobacillus*, *Mobiluncus* and *Gardnerella vaginalis*, is

scored in standard tables and is called Nugent's scoring system. High Nugent scores have been associated with increased risk of sexually transmitted infections, preterm birth and adverse perinatal outcomes such as post-abort sepsis, recurrent abortion, chorioamnionitis, postpartum endometritis and pelvic inflammatory disease. The bacterial vaginosis in a pregnant female

doubles the risk of preterm delivery². An estrogen deficient state in vagina and the immune compromised status due to diabetes or other associated vaginal factors can lead to growth of abnormal flora which may in turn lead to infections. Maximum number of women seeking treatment was young, sexually active females of age group 26-35 yrs. vaginal infections are a common gynaecological problem in the study area. The main predisposing factors for symptomatic vaginal infections are poor hygiene, low socioeconomic status, and early sexual activity. In bacterial vaginosis pH is elevated. In vaginal candidiasis, it is ≤ 4.5 . Causes of vaginal discharge include physiological, infective (e.g. bacterial vaginosis, candidiasis, trichomoniasis) and non-infective (foreign bodies, cervical ectopy and genital tract malignancy).³

Women of reproductive age group are carriers of various organisms like Group B *Streptococci*, *Candida*, *Listeria*, *Escherichia coli* (*E. coli*) etc. *E. coli* which has a strong association with preterm delivery and very low birth weight infants that can cause life-threatening neonatal diseases such as sepsis, meningitis, and necrotizing enterocolitis. During passage through the birth canal or before delivery *E. coli* can invade the chorioamnion or amniotic fluid and can lead to complications.⁴

Group B *Streptococci* (GBS) colonization is an independent risk factor for chorioamnionitis, being highest among women with the heaviest degree of colonization. The GBS colonised in the genital tract can enter the amniotic fluid and its aspiration can lead to invasive disease in the new born. Perinatal transmission can also occur across intact membranes. GBS also increases the risk of preterm labour, low-birth weight infant, postnatal and post-operative infections. Hence early detection of the carrier

state can be very helpful to the obstetrician and the pediatrician.

The aim of the study is find the prevalence of pathogenic microbes in HVS and to detect the carrier stage in patients attending Obstetrics and Gynaecology department with various complaints. Clinical syndromes of GBS disease in newborns include sepsis, meningitis, pneumonia, cellulitis, osteomyelitis, and septic arthritis. Bloodstream infections, with or without pneumonia, are the main manifestations of GBS disease in infancy and are evident in 89% of cases. Meningitis is less common, occurring in approximately 10% of neonatal infection. Neurologic sequelae associated with GBS infection are most profound among premature infants.⁵

Acinetobacter species have emerged as significant nosocomial pathogens, with *Acinetobacter baumannii* being the most frequently isolated species. They are resistant to most antibiotics and can be found in both hospitalized patients and the community. *A. baumannii* infections were identified with adverse pregnancy outcomes. The risk for premature delivery is high with fetal or neonatal demise.⁶

Women of reproductive age with vaginal discharge should have a high vaginal swab (HVS) cultured if (7, 8, 9 and 10)

Postnatal or post miscarriage

Vaginitis without discharge

Pre or post gynaecological surgery

Pre or post termination of pregnancy

Symptoms not characteristic of bacterial vaginosis.

Within 3 weeks of intrauterine contraceptive insertion.

Materials and Methods

Study design

Descriptive study

Study setting

Sree Avittam Thirunal Hospital (SATH), Thiruvananthapuram

Inclusion criteria

Females of reproductive age group attending gynaecology department at SATH, Thiruvananthapuram.

Study period was a period of two years, from 5/2015 to 4/2017.

Procedure

A total of 1315 females of reproductive age group were screened during the study period. The details of the patient were collected using a proforma and high vaginal swabs were collected after taking consent from the patients by the gynaecologist.

Sterile double swabs were used. One was used for direct microscopical examination and the other was used for culture on BA, MA and CA. Identification and speciation of the predominant isolates were done by conventional methods. Antibacterial and antifungal susceptibility testing was done by disc diffusion method as per CLSI guidelines.

Results and Discussion

All the *Candida* spp isolated were sensitive to Fluconazole, Itraconazole, Voriconazole and Amphotericin B. Antifungal resistance was

not noted in any of the isolates. All of the group B haemolytic *Streptococci* were sensitive to Penicillin.

Among the isolates of *Enterococci*, 7 % were resistant to betalactam antibiotics and had high level resistance to aminoglycosides but all of them were sensitive to Vancomycin and Linezolid.

Klebsiella species (4.5%) were sensitive to all the antibiotics including betalactams, aminoglycosides, and quinolones and resistant to ampicillin. Of these 2% were resistant to all antibiotics.

Only 1.2% of *E. coli* was multidrug resistant, showing resistance to quinolones, betalactams and aminoglycosides.

The two isolates of *Acinetobacter* spp were fully resistant to all the drugs.

A total of 1315 HVS samples from females of reproductive age group were studied during the period of two years.

In the present study pathogenic bacteria were found in 234 samples out of the total of 1315.

This constitutes about 18 % of the total samples. As per studies conducted by Gopalkumar *et al.*, (2015) the overall positivity for pathogenic aerobic microbes was 27% and that of *Candida* was 7.3%.

Of the 125 *Candida* isolated, *C. albicans* was 28% and the rest of them were Non albicans *Candida*, 72%.

In the study by Siti *et al.*, the recovery rate of *Candida* spp from pregnant women was 17.2% with *C. albicans* being the most common species detected (83.5%), followed by *C. glabrata* (16%) 2015 (Table 1 and Fig. 1).

Fig.1 Microbiological profile of High Vaginal swab

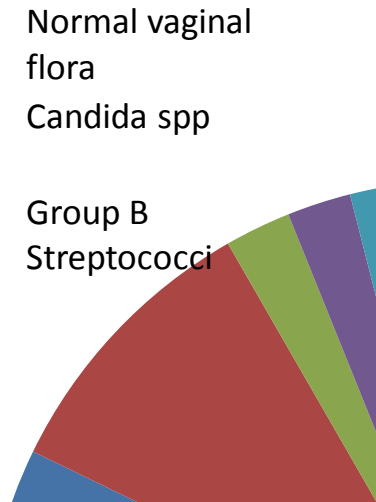


Table.1 Microbial profile of HVS

S.no	Organism	Number (%)
1	Normal vaginal flora	1081
2	<i>Candida</i> spp	125
3	<i>E. coli</i>	17
4	<i>Klebsiella pneumoniae</i>	28
5	<i>Staphylococcus aureus</i>	9
6	Group B <i>Streptococcus</i>	29
7	<i>Enterococcus</i> spp	24
8	<i>Acinetobacter baumannii</i>	2
	Total	1315

The present study highlights the predominance of non albicans *Candida* in this particular geographical area. This justifies the role of empirical antifungal therapy by obstetricians and gynaecologists for patients with vaginal discharge. The next common isolate was Group B *Streptococci*, 29 (12%). The carrier state of GBS was confirmed by rectal swabs of the patients. Yancey *et al.*, in a study on peripartum infections, 216 women (26%) were colonized with GBS.⁵ There were only two cases (0.9%) of *Acinetobacter* spp. (*Acinetobacter baumannii*). *Acinetobacter* as such is not a vaginal pathogen but in these cases the isolates were obtained by repeated sampling. Both these cases gave history of D&C from local hospital which indicates that

Acinetobacter is an iatrogenic infection. A wide spectrum of antibiotics resistance (so called “pan-resistant”) was seen with *A. baumannii* by Mai He *et al.*,⁶

In conclusion, *Candida* has been identified as the most common isolate among the pathogens from HVS. Hence the empirical use of antifungal is justified. The GBS forms 12% and *E. coli*, 7% of the total isolates which show the risk of neonatal infection in patients with premature rupture of membranes. Multi drug resistance in isolates indicates the importance of early culture and sensitivity for deciding empirical antibiotics in such patients, if they develop post natal uterine infections.

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