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**THE AEROBIC BACTERIAL PROFILE OF HIGH VAGINAL
GINAL SWAB – IN SUBURBAN CHENNAI**

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ABSTRACT

Vaginal flora is an environment with dozens of varying microbial species. Vaginitis is a common disease of women in reproductive age group mainly due to colonisation of different micro organisms. Overall 7–72% of women with vaginitis remain undiagnosed because of abnormal vaginal flora which is neither considered as normal, nor as bacterial vaginosis hence termed as ‘intermediate flora’ and its management is differ from that of bacterial vaginosis. Therefore the present study is conducted to rule of aerobic bacterial profile of pregnant and non pregnant women with vaginitis. A total of 120 high vaginal swabs were collected from patients. Of all the 120 cultured samples, 20 (17%) grew normal flora and significant growth of pathogens was obtained in 100 (83%) samples. This positive culture was obtained from 75 % of pregnant women and 25% of non-pregnant gynecological cases. Out of 100 positive samples, the most prevalent organism was *Escherichia coli*(32%) followed by *Klebsiella pneumoniae* (26%), *Staphylococcus aureus*(16%), *Staphylococcus epidermidis*(6%), *Pseudomonas aeruginosa* (6%), *Citrobacter koseri*(3%), *Streptococcus pyogenes*(4%), *Candida albicans*(3%), *Proteus mirabilis*(1%), *Hemophilus sps*(1%), *Enterococci sps*(1%) and *Micrococci sps*(1%). In our analysis we found out that the gram negative aerobic and anaerobic facultative pathogens were the commonest isolates accounting for 69%. To conclude vaginitis remains common clinical condition among women hence requires a thorough lab evaluation for appropriate treatment and effective management of this condition.

Keywords: Aerobic Vaginal Pathogens, High Vaginal Swabs and Vaginitis

INTRODUCTION

The vagina is the fibro muscular membranous sheath communicating the uterine cavity with the exterior at the vulva [1]. It constitutes the excretory channel for the uterine secretion and menstrual blood. The secretion of vagina is mainly derived from the gland of cervix, uterus, transudation of the vaginal epithelium and Bartholin's gland. The pH is acidic varies with different phase of life and menstrual cycle.

The infection of female genital tract results from the vaginal flora, other extraneous agents, iatrogenic etiology and other sexually transmitted disease.

The causes are poly-microbial including bacterial, viral, fungal and parasitic. These organisms can cause localized infection or it can be a part of systemic disease. Thus there can be variable clinical profile for this vaginitis. With this in our mind we undertook a study on aerobic bacterial profile of high vaginal swab of the women attending our obstetrics and gynecology department for a period of 3 months and the data was analyzed.

MATERIALS & METHODS

A total of 120 high vaginal swabs were collected from women attending obstetrics and gynecology outpatient department. The project was submitted to the institutional ethical committee for approval. After

obtaining consent from the patient the specimens were collected.

Inclusion Criteria: Patient with vaginal discharge and itching in reproductive age group.

Exclusion Criteria: Beyond the age of 60 years; itching due to other dermatological causes.

A questionnaire pertaining to the age, sex, marital status, use of contraceptive devices and the duration of discharge was given to patient which was filled by them and simultaneously their consent was obtained after which the sample was taken.

The sample was transported to Microbiology laboratory and cultured into Mac-Conkey agar, blood agar, chocolate agar and Sabouraud's dextrose agar. Wet saline mount preparation was also made and the observations were recorded.

RESULTS

A total of 120 high vaginal swabs were taken from pregnant and non-pregnant women. Of all the 120 cultured samples, 20 (17%) grew normal flora and significant growth of pathogens was obtained in 100 (83%) samples. This positive culture was obtained from 75 % of pregnant women and 25% were from non-pregnant gynecological cases.

Out of 100 positive samples, the most prevalent organism was *Escherichia coli* (32%). This was followed by *Klebsiella pneumoniae* (26%), *Staphylococcus aureus* (16%), *Staphylococcus epidermidis* (6%), *Pseudomonas aeruginosa* (6%), *Citrobacter koseri* (3%), *Streptococcus pyogens* (4%), *Candida albicans* (3%), *Proteus mirabilis*

(1%), *Hemophilus sps* (1%), *Enterococci sps* (1%) and *Micrococci sps* (1%) (Table 1).

In our study majority of the patients were pregnant women, out of the 100 positives cases, 75 were antenatal cases among which 51 patients were in the third trimester, 19 were in second trimester and 5 were in first trimester, the remaining 25 were non-pregnant gynecological cases (Table 2 & 3).

Table 1: Distribution of aerobic vaginal pathogens from high vaginal swabs

S.No	Organisms	Number of isolates(n=100)
1	<i>Escherichia coli</i>	32
2	<i>Klebsiella pneumoniae</i>	26
3	<i>Staphylococcus aureus</i>	16
4	<i>Staphylococcus epidermidis</i>	6
5	<i>Pseudomonas aueruginosa</i>	6
6	<i>Citrobacter koseri</i>	3
7	<i>Streptococcus pyogens</i>	4
8	<i>Candida albicans</i>	3
9	<i>Proteus mirabilis</i>	1
10	<i>Hemophilus sps</i>	1
11	<i>Enterococci sps</i>	1
12	<i>Micrococci sps</i>	1

Table: 2 Distribution of Gram negative organisms and Candida in association with pregnant and non-pregnant women

Stages of pregnancy	<i>E. coli</i>	<i>K. pneumoniae</i>	<i>Pseudomonas</i>	<i>Citrobacter</i>	<i>Proteus</i>	<i>Hemophilus</i>	<i>Candida</i>
1 st trimester	3	1					
2 nd trimester	4	8	3	1			
3 rd trimester	18	14	3	1	1	1	1
Gynecological condition cases	7	3		1			2
Total	32	26	6	3	1	1	3

Table: 3 Distribution of Gram positive organisms in association with pregnant and non-pregnant women

Stages of pregnancy	<i>S.aureus</i>	<i>S.epidermidis</i>	<i>S.pyogenes</i>	<i>Enterococci</i>	<i>Micrococci</i>
1 st trimester		1			
2 nd trimester	1	1	1		
3 rd trimester	8	2	2		
Gynecological condition cases	7	2	1	1	1
Total	16	6	4	1	1

DISCUSSION

Our study which included all these aspects had only patients in the reproductive age group with vaginal discharges, the most

important inclusion criteria, which was subjected for aerobic culture techniques.

In our analysis we found out that the gram negative aerobic and anaerobic facultative

pathogens were the commonest isolates accounting for 69%. Isolation of *E.coli* in our study was high (32) when compared to the other study [4] and isolation of *Klebsiella* was little less (26) than previous study [5] which was conducted among primary infertility patients in Nigeria. However both the studies revealed that there is a significant Enterobacteriaceae in the causation of vaginitis similar to our study.

The reason for the high gram negative bacterial vaginitis, may be due to the pregnancy status of our patients as depicted in (Table 2). Which is associated with hormonal changes, expanding uterus, with the fetus in utero which leads to constant stasis of urine which proves to be an ideal culture media for the growth of bacteria.

The close anatomical proximity of vagina with urethra in female also predisposes to recurrent infections and the faulty hygienic habits and the inability to cleanse the genito urinary areas thoroughly during pregnancy will also precipitate infection in those anatomically proximal areas [1,2]. Added on to this the enlarging uterus with advancing pregnancy will pressurize the bladder and the ureter which leads to incomplete emptying of the bladder. The same reasons contribute for the colonization of gram negative bacteria

which are seen commonly in large intestine which account for 10^8 - 10^9 [3].

More over majority of our patients come from rural area, where knowledge with respect to hygienic habit, personal cleanliness requires reinforcement by health education system by the health care workers including doctors and paramedics.

Gram positive organisms *Staphylococcus spp*; (*aureus* & *epidermidis*), *Streptococcus pyogenes*, *Enterococci* and *Micrococci* (28) was less in number when compared to the other study conducted in Chennai and Nigeria [4, 5].

Normally 40% of normal healthy individuals carry *Staphylococcus aureus* in their anterior nares, perineum, axilla. This can easily gain access to genito urinary system causing infection. Colonization of vagina by *Staphylococcus aureus* has also been recorded in 2-17% of healthy women [6]. *Enterococci* are also present in large intestine like Enterobacteriaceae.

CONCLUSION

Vaginitis is a common clinical condition observed in women of reproducing age group. More than a dozen of microbial organisms are responsible for causing this condition, characterized by itching and vaginal discharge. This requires a thorough lab

evaluation for appropriate treatment and effective management of this condition.

REFERENCES

- [1] D.C. Dutta. Text book of gynaecology, New central book agency (p) Ltd, fourth edition, 378-380.
- [2] D.C. Dutta. Text book of obstetrics, New central book agency (p) Ltd, sixth edition, 145-154.
- [3] Ananthanarayan and Paniker, Text book of Microbiology, Universities press, 9th edition, 621-624.
- [4] Sandhiya R, Lakshmipriya R, and Esthermary. Prevalence of Aerobic vaginal pathogens and their Antibiotic Susceptibility pattern in a Tertiary Care Hospital. Research journal of Pharmaceutical, Biological, and Chemical Sciences, 5(6), 2014, 936-940.
- [5] Momoh, A.R.M., Idonije, E.O., et al. Pathogenic bacteria –a probable cause of primary infertility among couples in Ekpoma: J.Microbiol. Biotech, Res,1 (3), 2011, 66-71.
- [6] Guinan ME, Dan BB, Guidotti RJ, et al. Vaginal colonisation with *Staphylococcus aureus* in healthy

women: A review of four studies. Ann Intern Med, 94, 1982, 944-947.