



SCREENING OF ANTENATAL WOMEN FOR VAGINAL MICROBIAL COLONIZATION PRESENTING TO A TERTIARY CARE HOSPITAL

Dr. Y. Kathyayani MD, Assistant Professor of Microbiology, Guntur Medical College, Guntur.

Dr. B. Harika Final Year Post Graduate, Dept of Microbiology, Guntur Medical College, Guntur.

ABSTRACT **Background:** Pregnant women are at risk group for high rates of infection due to immunological hormonal changes and also presence of more glycogen stores. Abnormal vaginal colonization may pose great risk to mother and new born leading to varied outcomes. **Aims & Objectives:** To assess the prevalence of vaginal microbial colonization in antenatal women. **Materials and Methods:** This study has been conducted in the department of Microbiology, Guntur medical College, Guntur. 88 antenatal women were involved in the study. 2 vaginal swabs were collected and processed for Group B Streptococcus, Candida species and also for Biofilm detection according to standard guidelines. **Results:** Out of 88 antenatal women, majority were multigravida and majority were in the age group of 20 – 30 years. Non Albicans Candida has been isolated in major samples followed by Candida albicans followed by Staphylococcus, Enterococcus, E.coli. **Conclusion:** The isolates in the present study were potentially pathogenic and vaginal infection may negatively influence the mode of delivery. Hence regular screening for potential pathogens in antenatal women at appropriate time can prevent the preterm births and neonatal complications

KEYWORDS : Non Albicans Candida, Colonization, Biofilm, Group B Streptococcus

INTRODUCTION

Reproductive tract infections are posing a greater public health threat and they have 5% annual prevalence catering to 40 million cases of new infections occur per year. (1) Vaginitis can be caused by infectious and noninfectious causes. Microbial factors can alter the normal vaginal flora causing deficiency of lactobacilli which play a major role in maintaining normal vaginal flora. (2). Group B Streptococcus (GBS) is a major pathogen causing morbidity and mortality in antenatal women and their new borns. (3) GBS is often associated with negative pregnancy outcomes, including preterm labour, chorioamnionitis and premature rupture of membranes. (4). One of the important aspects in the perinatal health is to know the maternal colonization with Group B Streptococcus. (5) Epidemiological surveys in India have shown lower colonization and infection rates (1.76%- 16%) (5, 6) Pregnancy is the predisposing factor for Vulvovaginal Candidiasis where 75% of women have atleast one episode in lifetime. Amongst the Candida species isolated from vaginal specimens, C. albicans is the most predominant, followed by other non-albicans Candida (NAC) such as C. glabrata, C. tropicalis, C. dubliniensis and C. krusei. Recent studies show that NAC are mostly isolated from clinical specimens and they are developing resistance to most of the antifungals.

Inclusion Criteria

All pregnant women who visited the antenatal clinic with or without any complaints irrespective of age, parity, and period of gestation were considered after due informed consent.

Exclusion Criteria

Pregnant women in labor, history of leaking per vaginum/absent membranes, history of antimicrobial treatment in preceeding 2 weeks, medical complications of pregnancy such as anemia, hypertension, diabetes. HIV-positive women, women with organic lesions, women who did not give consent.

MATERIALS AND METHODS

88 antenatal women were involved in the study. This study has been conducted in the Department of Microbiology, Guntur Medical College, Guntur from March to August 2025 after obtaining informed consent. Two vaginal swabs with Amies Transport medium were collected from each patient. One swab was subjected for wetmount, Gram staining, culture on SDA. Another swab was introduced in to 5 ml of enrichment broth [Todd Hewitt (TH) Broth with Gentamicin (8 mcg/ml) and Nalidixic acid (15 mcg/ml)] and incubated overnight at 35°C aerobically with 5 to 10% CO₂ (carbon dioxide). After 24 to 36 hours, 10 ul loopful of the TH broth culture was then subcultured on Hi Crome™ Strep B Selective agar and the plates were incubated overnight at 37°C in 10% CO₂ (carbon dioxide). Then, the enrichment broth subcultures were examined for the presence of GBS colonies. Standard microbiological techniques (smear microscopy, catalase test and bacitracin susceptibility) were followed.

RESULTS

Out of 88 antenatal women participated in the study, 35 were

Primigravida and 53 were multigravida. 17 women were < 36 weeks of gestation where as 71 women were > 36 weeks of gestation. According to age wise distribution, 18 women were < 20 years, 48 women were between 20-30 years and 22 women were > 30 years.

34 % were presenting with symptoms where as 66% were asymptomatic. The most common symptoms were curdy white discharge, burning micturition and itching which is shown in fig 1.

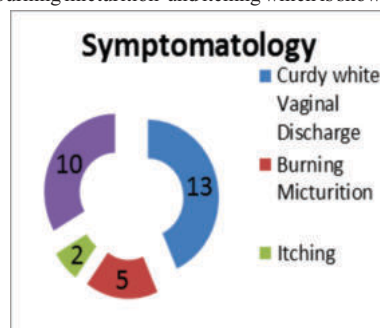


Fig 1. Symptomatic Presentation of Patients

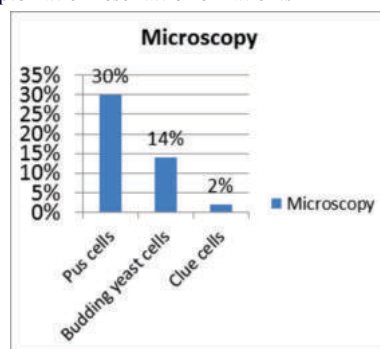


Fig 2. Microscopic Findings of the Samples

Microscopic observation of samples showed pus cells in majority followed by budding yeast cells. 2% of samples revealed clue cells which is depicted in fig 2

The culture positivity of the organisms grown was Candida albicans (15%), Non Albicans Candida (25%), Staphylococcus (2%), Enterococcus (3%), Mobilincus (2%), E.coli (1%), Klebsiella (1%). The most common isolates among Non Albicans Candida were Candida parapsilosis, C. kefyr, C. stellatoidea, C. tropicalis, C. dubliniensis, C. glabrata, C. krusei. Non Albicans Candida isolated from Leucorrhea were C. stellatoidea (3.5%), C. tropicalis (2.3%) and C. krusei (1.7%).

DISCUSSION

Vaginal microbiota plays a crucial role in maintaining immune homeostasis and reproductive health. Healthy pregnant women vaginal microbiome contains lactobacillus which maintains acidic environment giving protection against pathogens. This non lactobacillus environment increases inflammatory responses causing Pre Term births⁸. Majority of pregnant women were in the age group of 21-30 years which is correlating with a study by Ruby Khatoon et al⁹. Majority of the women were multigravida (60%) which is in correlation with a study by Bushra Saleem et al¹⁰. The most common symptom in the present study was Vaginal discharge followed by burning micturition which is similar to a study by Bushra Saleem et al¹⁰. In the present study *Candida albicans* has been isolated in 15% and Non *albicans* *Candida* in 25% and Group B *Streptococcus* has not been isolated from any of the participants. These results are in consistency with a study by Eskezia et al¹¹. The colonization of Non *albicans* *Candida* in symptomatic and asymptomatic pregnant women in the present study was in correlation with a study by Waikhom SD, et al. Hormonal changes during pregnancy and childbirth, particularly fluctuations in estrogen and progesterone, can alter the vaginal microbiome, creating an environment conducive to *Candida* overgrowth¹³. Abnormal vaginal colonization in the present study was 26% which is similar to a study by Kyung-A Son et al¹⁴. Biofilm detection was also carried out by Microtitre plate method showing 70 % of *Candida* species are Bio film producers which is shown in fig 3.

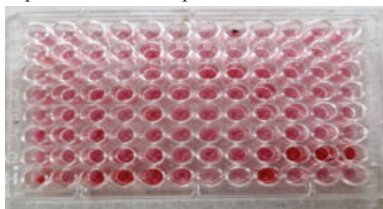


Fig 3. Microtitre Plate Method for Detection of Biofilm Production

CONCLUSION

The prevalence of vaginal candida along with absence of GBS colonization suggest important implications for clinical practice and public health. Regular screening for candida should be incorporated especially in multigravida. This enhances maternal and neonatal outcomes.

Conflicts of Interest: Nil

Acknowledgements: The authors would like to acknowledge the participants in the study.

REFERENCES

- Thulkar J, Kriplani A, Agarwal N, Vishnubhatla S. Aetiology & risk factors of recurrent vaginitis & its association with various contraceptive methods. *Indian J Med Res.* 2010;131:83-87.
- Razzak MSA, Al-Charrakh AH, Al-Greitty BH. Relationship between lactobacilli and opportunistic bacterial pathogens associated with vaginitis. *N Am J Med Sci.* 2011;3(4):185-192. doi: 10.4297/najms.2011.3185
- Rausch AV, Gross A, Droz S, Bodmer T, Surbek D. Group B *Streptococcus* colonization in pregnancy: prevalence and prevention strategies of neonatal sepsis. *J Perinat Med.* 2009;37(2):124-129. doi: 10.1515/JPM.2009.020
- Fry R. Fatal infections by hemolytic *Streptococcus* group B. *Lancet.* 1938;231(5969):199-201. doi: 10.1016/S0140-6736(00)93202
- Schrag S, Gorwitz R, Butts KF, Schuchat A. Centers for Disease Control and Prevention. Prevention of perinatal group B *Streptococcal* disease. *Morb Mortal Wkly Rep* 2002;51(11):1-22.
- Shet A, Ferrieri P. Neonatal and maternal group B *Streptococcal* infections: A comprehensive review. *Indian J Med Res* 2004; 120:141-150.
- Sayanika Devi Waikhom, Innocent Afeke. Prevalence of vulvovaginal candidiasis among pregnant women in the Ho municipality, Ghana: species identification and antifungal susceptibility of *Candida* isolates. *BMC Pregnancy and Childbirth* (2020) 20:266
- Dharti C Patel, Ashish Rao et al Impact of Early Pregnancy Vaginal Microbiome Composition on Preterm Birth Risk: A Prospective Cohort Study. *European Journal of Cardiovascular Medicine.* Volume 15 Issue 5 (May, 2025) | Pages 283 – 286.
- Ruby Khatoon et al. Detection of vaginal colonisation of group b streptococci in pregnant women by culture methods in a tertiary care centre. *Journal of Population Therapeutics & Clinical Pharmacology.* Vol.32 No. 01 (2025) (1542-1552)
- Bushra saleem¹, Saba fayyaz jeelani² Frequency of Vaginal Candidiasis in Symptomatic Pregnant Women Attending Routine Antenatal Clinic . *P J M H S Vol. 10, NO. 3, JUL – SEP 2016*
- Eskezia et al. The prevalence and risk factors of vaginal *Candida* species and group B *Streptococcus* colonization in pregnant women attending antenatal care at Hawassa university comprehensive specialized hospital in Hawassa City, Southern Ethiopia *BMC Pregnancy and Childbirth* (2025) 25:299
- Waikhom SD, et al. Prevalence of vulvovaginal candidiasis among pregnant women in the Ho municipality, Ghana: species identification and antifungal susceptibility of *Candida* isolates. *BMC Pregnancy Childbirth.* May 2020;20(1):266. <https://doi.org/10.1186/s12884-020-02963-3>.
- Davari A, Hedayati MT, Jafarzadeh J, Nikmanesh B, Nabili M, Hamidieh AA, Abastabar M, Ahmadi N, Al-Hatmi AMS, Moazeni M. Evaluation of *Candida* colonization index, molecular identification, and antifungal susceptibility pattern of *Candida* species

isolated from critically ill pediatric patients: A single-center study in Iran. *Curr Med Mycol.* 2022;8(4):15–21. <https://doi.org/10.32598/CMM.2023.1372>. PMID: 37736608; PMCID: PMC10509495

- Kyung-A Son, Minji Kim Prevalence of vaginal microorganisms among pregnant women according to trimester and association with preterm birth. *Obstet Gynecol Sci* 2018;61(1):38-47