Pap Smears in the Diagnosis of Bacterial Vaginosis

A. Raina, Assistant Professor,
K. Nasreen, Assistant Professor,
U. Tayal, Associate Professor,
A. Rawat, Associate Professor,
V. H. Talib, Professor & Head

— Department of Pathology, Rama Medical College Hospital & Research Centre, Ghaziabad.

Abstract

Pap smears are routinely used in cervical cancer screening. The purpose of our study was to determine whether the Pap smear is of diagnostic value for the detection of bacterial vaginosis using vaginal gram stain as the diagnostic standard.

We studied 636 non-pregnant, married women attending the Gynecology OPD of Rama Medical College, Ghaziabad, for routine genital examination between Sep 2011 and Sep 2012. Two vaginal smears were prepared, one of which was stained by the pap method and the second by the Gram’s method. Using Gram stain diagnosis of bacterial vaginosis as the gold standard, pap smear had a sensitivity of 61.0% and a specificity of 97.6%, PPV of 85.7% and NPV of 91.6% in the diagnosis of bacterial vaginosis. Hence, although pap smear is only moderately sensitive for screening of bacterial vaginosis, because of its high specificity, it is of diagnostic value when it is positive.

Keywords

bacterial vaginosis, gram stain, pap smear

Introduction

Bacterial vaginosis is a common infection in women of the reproductive age group that ensues when normal lactobacilli are replaced by an overgrowth of anaerobes and gram negative rods. While the etiology of bacterial vaginosis is not clear, the menstrual cycle, concomitant infections, sexual activity, contraceptive methods and antibiotic use have all been implicated. Afflicted women are mostly asymptomatic, a few complain of a watery-grey discharge with a fishy smell. Diagnosis is important as it can lead to pelvic inflammatory disease, preterm birth and chorioamnionitis. In addition, these women are at a higher risk of acquiring infections like herpes simplex virus type-2 (HSV-2). Trichomonas vaginalis, Neisseria gonorrhoeae and HIV.

Gram stained slides of vaginal smear graded by Nugent’s criteria may be considered the gold standard for diagnosis of this condition.

In our study we compared conventional pap stained vaginal smears considering gram stained smears as the gold standard for diagnosing bacterial vaginosis.

Materials and Methods

Our study sample comprised six hundred and thirty six women attending the gynecology OPD of RMC between Sep 2011 and Sep 2012. Married women between the ages of 18-45 years with or without complaints of vaginal discharge were included. Exclusion criteria were unmarried...
status, ongoing menstruation, pregnancy, patients on antibiotics, either/both smears inadequate for examination and patients not willing to participate in the study. Vaginal smears were taken with a wooden Ayre’s spatula and spread onto two glass slides. One of the slides was immediately fixed in alcohol and stained by the pap method; the second was air dried, heat fixed and stained by Gram’s method.

The gram stained smears were graded by the Nugent criteria from 1+ to 4+ depending on the number counted per oil immersion field as 1+ if <1 per field; 2+ for 1 to 5 per field; 3+ for 6 to 30 per field and 4+ for >30 per field. Lactobacillus were identified as large gram-positive rods, G. vaginalis and Bacteroides spp. as small gram-negative to gram-variable rods and Mobiluncus spp as curved gram-variable rods. A score of 7 or more qualified as bacterial vaginosis, 4 to 6 as intermediate, and 0 to 3 as normal.

In pap smears, the vaginal epithelial cells completely covered by the gram variable coccobacilli such that their edges become indistinct, were considered as the clue cells.

The sensitivity, specificity, positive predictive value, and negative predictive value were calculated taking the results of the gram stained smear as the gold standard.

Results

Out of a total of 636 women, a total of 118 (18.5%) cases of bacterial vaginosis were diagnosed by gram staining. Bacterial vaginosis was diagnosed in 35.9% of those with abnormal vaginal discharge (64/178), and in a 11.7% (54/458) of those without. In comparison with gram staining, the sensitivity, specificity, positive predictive value and negative predictive value of pap smear were 61.0%, 97.6%, 85.7% and 91.6%.

Discussion

Our purpose was to determine the efficacy of the Pap smear in making the diagnosis of bacterial vaginosis for gram stained smears as the diagnostic standard.

Although, culture is the gold standard method for diagnosis for most bacterial infections, this does not hold true for bacterial vaginosis as the organisms constitute a part of the normal vaginal flora. Gram stained slides of vaginal smear graded by Nugent’s criteria may be considered the gold standard for diagnosis of this condition. It classifies gram stained vaginal smears into normal, intermediate and bacterial vaginosis based on the gram stain scoring system.

The sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic value of Pap smear were determined taking gram stained smears as the gold-standard. Pap smear had a sensitivity of 61.0%, specificity of 97.6%, positive predictive value of 85.7%, and negative predictive value of 91.6% for the diagnosis of bacterial vaginosis.

Other studies in the Indian subcontinent have reported a prevalence ranging from 19% to 32%. Some studies over-report the prevalence of bacterial vaginosis as the studies included only women complaining of vaginal discharge. The highest prevalence of bacterial vaginosis is reported in women attending STD clinics. We found an overall prevalence of 18.5%.

We divided the women included in our study into two groups and found a higher prevalence of bacterial vaginosis (35.9%) in the group of symptomatic women complaining of vaginal discharge. A lower prevalence of 11.7% was seen in the cohort of asymptomatic women. This is in concordance with the fact that many women with bacterial vaginosis are asymptomatic. Compared to gram staining, pap smear with a sensitivity of 61% can not be regarded as sensitive enough to be used as a screening test for bacterial vaginosis. However, pap smears may be of importance in diagnosing bacterial vaginosis in asymptomatic women undergoing cervical cancer screening as being asymptomatic, they are unlikely to be diagnosed or treated for bacterial vaginosis otherwise. This is likely to be of consequence considering the morbidity and complications of bacterial vaginosis. Also, because of the high specificity of pap smear in the diagnosis of bacterial vaginosis, approaching 100%, a positive diagnosis is of definite diagnostic value.

Acknowledgement

The authors are grateful to all the faculty of the Department of Gynecology, Rama Medical College Hospital & Research Centre for their help and co-operation in carrying out this study.

References

1. Fredricks D.N., Fiedler T.L., Thomas K.K., Oakley B.B., Marrazzo J.M. — Targeted PCR for detection

"Indian Medical Gazette — NOVEMBER 2013"


