

Bacterial Flora Of The Vagina And Cervix In Non-pregnant Nigerian Women

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Abstract

A qualitative comparative study of the bacterial flora of the vagina and cervix of 90 non-pregnant women of reproductive age (18-35 years) Calabar was undertaken. The study revealed that both aerobic and microaerophilic organisms as well as the strictly anaerobic bacteria constitute the microflora of the lower genital of this group of women. Of the 90 women sample, Lactobacilli were the most frequent isolated organism in both the cervix and vagina, occurring in 62.2% and 75.6% of the sample respectively. Proteus species were the least in incidence, occurring in only 4% of either the cervical or vaginal specimens. The following pathogenic organisms were isolated in both the vagina and cervix. Escherichia coli, Staphylococcus aureus, Candida albicans, Clostridium species and Beta-haemolytic streptococci. In general, the same types of organism were isolated in both the cervical and vaginal sample, although the incidence in the two sources varied.

Key words: Bacterial flora, vagina, cervix, non-pregnant women, reproductive age.

Introduction

The vagina and the cervix are physiologically different. The vagina is marked acidic (pH 3.8-4.2). This acidity results from the breakdown of glycogen present in the vaginal mucosa to lactic acid by lactobacillus species. Glycogen present in the vaginal mucosa is controlled by secretion of oestrogen and progesterone^{2,3}. When these steroidal hormones are active as is the case during reproductive period of life, more glycogen is deposited.

The environmental condition of the cervix is quite distinct from that of the vagina. The pH of the endocervix (about 7.8) is more neutral than the acid milieu of the vaginal vault (pH 3.8-4.2)⁴, hence the microflora of the cervix would be expected to contain less number of acidogenic and acidophilic organisms than the vagina. As suggested by Bartlett⁵, the presence of the columnar epithelium at the endocervical region of the cervix as compared to the squamous epithelium on the rest of the cervix and vagina could have an important effect on bacteria adherence.

The study was then carried out prospectively on 90 non-pregnant women attending the gynaecological out-patient department of the University of Calabar Teaching Hospital to assess and compare qualitatively, the microbial flora of their vagina and cervix. None of the patients practiced any contraception.

Material and Methods

Sources of Samples: Samples were obtained from 90 non-pregnant patients who presented themselves at the gynaecological clinic for routine gynecological evaluations. The age range of these patients was 18-35 years (mean 21.5 years). Care was taken to exclude patients who were or had been on antibiotics therapy with one month before visits or patients presenting with vaginal bleeding, discharge or itching. Patients on contraception were also excluded from the study. Non-

pregnant state was established clinically and confirmed by pregnancy test when in doubt.

Sample Collection: Samples were collected with sterile cotton tipped swabs on wooden applicator sticks encased in plastic tubes (Sterilin Ltd, 43/45 Board Street, Teddington, Middlesex, UK). Using aseptic technique, a sterile speculum was inserted into the vagina and while the cervix was in view, high vaginal and cervical swabs were taken, avoiding contact with surface other than those designated for sampling. The swabs were immediately placed in Stuart's transport media contained in Bijo bottles, which were freshly built to expel air. Each swab stick was broken off in the medium and the bottles screwed down firmly.

Processing of Sample: The specimens were returned to the laboratory and each inoculated on to sterile plates of blood agar, chocolate agar and MacConkey (bile salt) agar within 2 hours of collection. The plates were incubated aerobically, microaerophilically in Gas-Pak jar at 37°C for 48 hours. Anaerobic plates with no growth after the initial 48 hours incubation were re-incubated for another 24 hours. At the end of incubation, the cultures were read and appropriate colonies subcultured for purity. The routine laboratory methods involving microscopically, biochemical and physiological tests were used to identify the different organisms⁶.

Results

Both the vagina and the cervix contained the same group of organisms. They comprised the aerobic bacteria such as Escherichia coli, Proteus species and Staphylococci as well as the Microaerophilic bacteria, Gardnerella vaginalis. Strict anaerobic bacteria isolated included: Bacteroides, Peptococcus,

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Peptostreptococcus, Lactobacilli and Clostridia species.

Table 1 Shows the distribution of the various isolates from the vagina and cervix of the women sampled. Lactobacilli constituted the highest number of isolate, occurring in 75.6% of the vaginal sample and 62.2% of the cervical specimen Proteus species were the least frequently isolated bacteria and constituted only 4.4% of either the vaginal or cervical samples. The incident and type of bacterial species isolated for the vagina and cervix of non-pregnant women of reproductive age in Calabar were about the same.

Discussion

The difference between the vagina and cervix arising from their embryological origin epithelial lining, secretions and PH, would suggest that there should be marked differences in the microflora of the two anatomical areas. This comparative study has not found it to be so.

Table 1: Bacterial Isolates from the Vagina and Cervix of 90 Non-Pregnant Women in Calabar.

Bacteriodes sp.	30(33.3)	27(30.0)
Peptostreptococcus sp.	27(30.0)	20(22.2)
Escherichia coil	20(22.2)	16(17.8)
Canida albicans	16(17.8)	12(13.3)
Streptococcus agalactiae	14(15.6)	10(11.1)
Streptococcus agalacitae	11(12.2)	5(5.6)
Peptococcus sp	10(11.1)	14(15.6)
Clostridim sp	7(7.8)	5(5.6)
Proteus sp	4(4.4)	4(4.4)
Total Isolates	404	326
Mean No.of isolates /subject	4.5	3.6

The study has shown that the microflora of the female lower genital tract is considerably complex and inhabited by different micro-organism, the most frequent being lactobacilli species which occurred in 75.6% of the vaginal and 62.2% of the cervical cultures. Incidence of Lactobacilli in the vaginal isolated of other worker vary between 49% and 82%^{7,10}. The high frequency of diphtherias in vaginal and cervical sample (66.7%) and 53.3% respectively) is suggestive of the fact that they are constantly exposed to the external surface Escherichia coil, streptococci faecalis, Staphylococcus aureus and Staphylococcus epidermidis occurred within the range of 17- 59% in the vagina and cervix. This is not very supporting because of the proximity of the genital tract to the anal orifice.

The isolates that occurred less frequently were Proteus species (4.4%) and Clostridium species (7.8% and 5.6%) of the vaginal and cervical specimens respectively. All the organisms isolated from the vaginal were also isolated from the cervix in proportions, which did not differ significantly. This was consistent with the

findings by previous investigations^{9,11-13}.

Though the present study and the ones cited above have shown that the vagina and cervix are inhabited by similar multiple organism, Bartlett⁵ noticed some difference when paired specimens from individual patients when were analyzed. It is also interesting to note in this study that there were no differences in the incidence or type of bacterial species isolated from the vagina and cervix of women reproductive age in Calabar. The mean number of bacterial isolated per specimen was 4.5. for the vagina and 3.6 for the cervix. These results are similar to those of Corbishley⁹ who recorded the means of 5 and 4 for the vagina and cervix respectively.

It has been stated that there is local secretory Immune system in the endocervix producing IgA, which destroys bacteria in the presence of complement and lysozyme, blocks bacterial adhesion to mucosal cells and promotes agglutination and phagocytosis¹⁴. These reasons may explain why the incidence figure for bacterial isolates from the cervix tend to be less than those from the vagina.

Care was taken to exclude women on or with recent history of antibiotics therapy from the study because it is known that such therapy may not only kill the causative agent of infection, but also the normal flora may be eliminated¹⁵⁻¹⁷ and thereby create a suitable environment for opportunistic organisms to flourish.

Most bacteria isolated from the female lower genital tract were potential pathogens. Thus the normal flora of human vagina and cervix should be seen as a complex flora of interacting and competing micro-organisms. The conditions of low pH and oxygen tensions, the production of inhibition substance by other organism and by the tract itself, and the competition for nutrients will all affect the survival and density of any organisms in the female genital tract⁹. Besides, it must be remembered always that when the conditions are right, these organism could also be the agents of infection in the female genital tract and beyond.

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