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Research Article

**AN ASSESSMENT OF AEROBIC GRAM-NEGATIVE RODS
OCCURRENCE IN THE HIGH VAGINAL SWABS:
DETERMINATION OF ANTIMICROBIAL SUSCEPTIBILITY
PROFILE**¹Dr Omairah Qamar, ²Dr Kamran Malik, ³Dr Muhammad Shahid Kabir¹Benazir Bhutto Hospital Rawalpindi, ²Medical Officer, BHU Gakhra Kalan, Gujrat, ³Punjab
Medical College Faisalabad.**Article Received:** December 2018**Accepted:** February 2019**Published:** March 2019**Abstract:**

Objective: The goal of this study was to find out the frequency of aerobic gram-negative rods in high vaginal swabs and to determine their antimicrobial susceptibility profile.

Methodology: This group research was conducted at Benazir Bhutto Hospital Rawalpindi in the timeframe of six months starting from August 2017 to February 2018. After collection of vaginal swabs, we cultured all the samples on agar plates (MacConkey) and blood with incubation on the temperature of 35 – 37 degrees Celsius for a period of 24 – 48 hours. Every patient gave his informed consent before the commencement of research and ethical approval was also taken before the commencement of research. Statistical analysis was made on SPSS.

Results: Majority of culture-positive females were between 25-30 years of age. *Escherichia coli* (72%), *Klebsiella spp* (16%), *Enterobacter* (6%), *Proteus spp* (2%), *Morganella* (2%), *Pseudomonas spp* (2%). All these isolates showed good sensitivity towards imipenem and Cefoperazone sulbactam.

Conclusion: *Escherichia coli* (72%) was the predominant organism followed by *Klebsiella spp* (16%).

Keywords: Bacterial vaginosis, vaginal candidiasis, high vaginal swabs, imipenem, Cefoperazone sulbactam.

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INTRODUCTION:

Vaginal discharge is a common gynaecologic problem among sexually active females containing variety of microorganisms and *Lactobacillus* spp being the predominant one [1]. These vaginal microbes play a protective role against pathogens by maintaining acidic vaginal pH [2]. Physiological vaginal discharge comprises of secretions from endocervix and Bartholin's gland. It is usually due to infection or inflammation of vagina. The pathogens involved may vary in different regions [3]. Most repeated vaginal inflammation causes were (40% – 45%) bacterial vaginosis, (20% – 25%) vaginal candidiasis and (15% – 20%) trichomoniasis; although, there were 7% – 72% diagnosed women [1].

Bacterial vaginosis is a polymicrobial disease caused by mainly *Gardenerella vaginalis*. It will result in foul smelling thin whitish gray discharge. Vaginal itching and difficult painful urination may also occur. There may be no obvious vaginal inflammation and culture is usually not helpful in this case [4]. Severe itching, burning, soreness and a thick odourless white discharge are common signs of vaginal candidiasis. This is common infection in process of giving birth to children [5]. In a study, *Candida albicans* was responsible for 80% – 92% vaginal inflammation [6].

Trichomoniasis is a STD caused by *Trichomonas vaginalis*. Symptoms include vaginal irritation and frothy yellow – green discharge. Redness of skin, accumulation of excessive watery fluids, skin abrasion, painful urination and itching may occur. Small red spots appear on epithelium of upper vagina and cervix so, this infection is called Colpitis Macularis and spots are called 'strawberry spots'. Trichomoniasis increases the risk of HIV transmission [7, 8]. It may result in infertility, postoperative infections and abnormal growth of cells on cervical surface that could lead to cervical cancer [9]. Vaginal discharge is

often neglected problem and this study was conducted to make clear the commonness of various aerobic gram negative bacilli in high vaginal swabs and their susceptibility towards currently used antibiotics.

MATERIALS AND METHODS:

This group research was conducted at Benazir Bhutto Hospital Rawalpindi in the timeframe of six months starting from August 2017 to February 2018. Females having any chronic disease were excluded. After collection of vaginal swabs, we cultured all the samples on agar plates (MacConkey) and blood with an incubation on the temperature of 35 – 37 degrees Celsius for a period of 24 – 48 hours. Majority of culture positive females were between 25 – 30 years of age. The antimicrobial susceptibility testing of all isolates was done by Kirby Baur disc diffusion method. The pure culture was obtained and then injected on nutrient agar and antibiotic discs were applied. After overnight, incubation plates were examined to read the susceptibility zones [10]. The frequency and susceptibility of different microorganisms was presented as percentages. The data was entered & analyzed in SPSS.

RESULTS:

In this study, majority (63%) of females were in age group 25-30 years, 33% in 31-35 years and 4% in 36-40 years. In this study, normal vaginal flora was isolated from 11 specimens. Out of 89 positive cultures, aerobic gram negative bacilli were isolated from 50 cases while in 39 cases, candida and other bacterial species were present. *Escherichia coli* was the predominant organism isolated from 36 (72%) samples, *Klebsiella* spp were present in 8 (16%) specimens. Other gram negative bacteria of lower commonness were *Proteus*, *Enterobacter*, *Morganella* and *Pseudomonas* spp.

Table – I: Frequency of aerobic gram negative rods in high vaginal swabs

Organisms	Isolates Number	Isolates Percentage
<i>Escherichia coli</i>	36	72
<i>Klebsiella</i> spp	8	16
<i>Enterobacter</i>	3	6
<i>Proteus</i> spp	1	2
<i>Morganella</i>	1	2
<i>Pseudomonas</i> spp	1	2

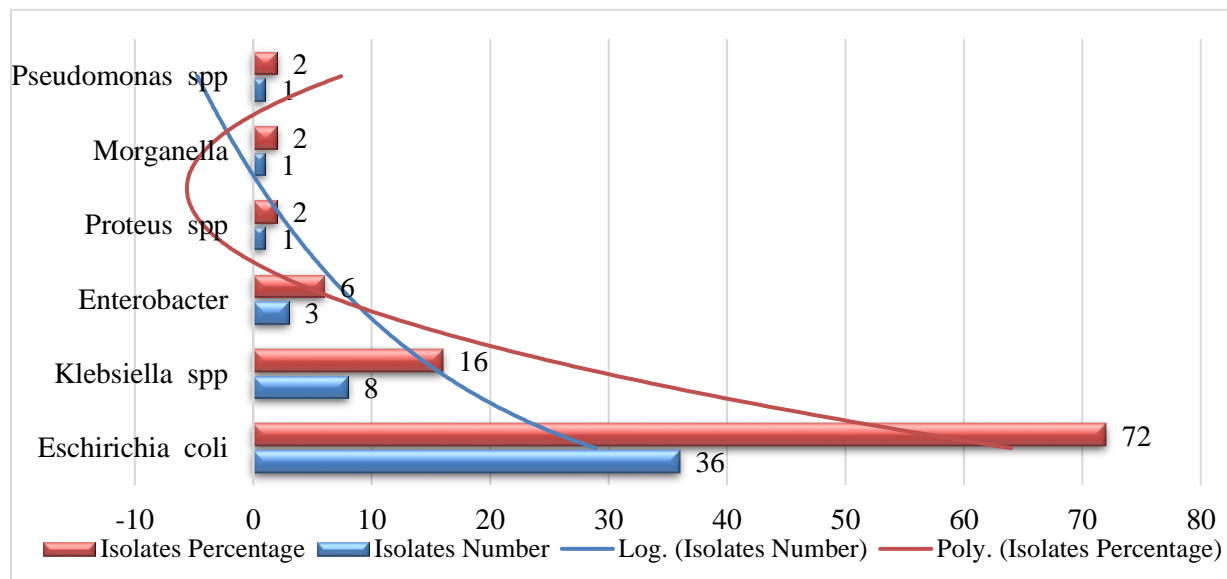
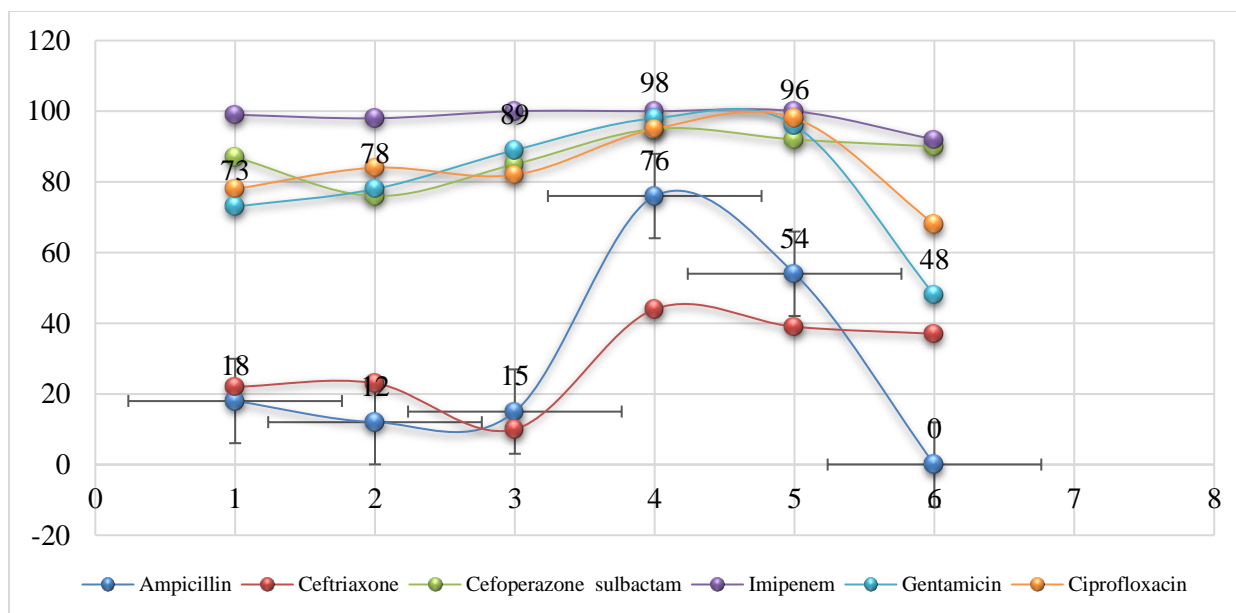


Table – II: Sensitivity of the isolates against various antibiotics

Antimicrobial Agents (Percentage)	Escherichia Coli	Klebsiella Spp	Enterobacter	Proteus Spp	Morganella Spp	Pseudomonas Spp
Ampicillin	18	12	15	76	54	0
Ceftriaxone	22	23	10	44	39	37
Cefoperazone sulbactam	87	76	85	95	92	90
Imipenem	99	98	100	100	100	92
Gentamicin	73	78	89	98	96	48
Ciprofloxacin	78	84	82	95	98	68



DISCUSSION:

Sexually active females commonly report issues of vaginal discharge. A change in the regular vaginal organisms is potent to cause bacteria colonization which leads to an act of vaginal discharge [2]. It is quite a common problem but our knowledge regarding this is less. Frequency of microorganisms causing vaginitis varies with respect to age and place. This group research was conducted at Benazir Bhutto Hospital Rawalpindi in the timeframe of six months starting from August 2017 to February 2018. The age of females suffering from vaginitis caused by gram negative rods was between 25 to 39 years. The mean age of patients was (30 ± 2.8) years. *E. coli* was the most common organism 39.45% [1]. The antibiotics used in our study were ampicillin, ceftriaxone, cefoperazone – sulbactam, imipenem, gentamicin and ciprofloxacin. Most of the samples showed sensitivity to imipenem and cefoperazone – sulbactam. Similarly, in a previous study, most gram negative rods were sensitive to imipenem [10]. In contrast to this study, Tariq N & colleagues, reported that normal vaginal flora was isolated in 30% patients [14]. Another research conducted on females for the occurrence of aerobic pathogens in vaginal infections showed that most prone age group was 15 – 45 years, with percentage of *E. coli*, was 72% [15].

CONCLUSION:

E. coli was the most common microorganism in high vaginal swabs, with highest sensitivity to imipenem and cefoperazone – sulbactam. The high commonness of vaginal gram negative

colonization in this study demands that culture for both aerobic and anaerobic bacteria must be done. Moreover, there must be an antibiotic policy according to local sensitivity patterns to prevent antibiotic resistance.

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