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Research Article

**A CROSS-SECTIONAL STUDY TO ASSESS THE AEROBIC  
VAGINITIS INCIDENCE (AV) IN EXPECTING WOMEN OF  
REPRODUCTIVE AGE**<sup>1</sup>Dr. Saman Manzoor, <sup>2</sup>Dr. Inamullah Khan, <sup>3</sup>Dr. Syed Tahseen Riaz Kazmi<sup>1</sup>University Medical and Dental College Faisalabad<sup>2</sup>Punjab Medical College Faisalabad<sup>3</sup>Independent Medical College Faisalabad**Abstract:**

**Objective:** This particular research aimed at the vaginitis frequency determination in the patients of reproductive age who visited the hospital.

**Methods:** Research chose a cross-sectional design to complete this research at Gynecology and Obstetrics Department of Sir Ganga Ram Hospital, Lahore (February to September 2017) on a total of one hundred female patients clinically suspicious for vaginitis. In a laboratory setting research carried out Gram' staining followed by blood agar inoculation, MacConkey and Chocolate agar with an incubation of thirty-seven Degree Celsius for the identification of organisms.

**Results:** A total of forty-one percent patients presented Aerobic Vaginitis (AV) frequency, especially the age group from twenty-six to thirty years. About seventy-eight percent of the patients had mild AV incidence. We reported *Enterococcus faecalis* as most repeated isolated organism in about (26.83%) patients, *Escherichia Coli*, *Staphylococcus Aureus* and *Coagulase Negative Staphylococci* were other most repeated isolated organism with respective proportions of (21.95%), (12.2%) and (14.63%).

**Conclusion:** Our outcomes reflected higher vaginal infection frequency in the sexually active females who were at the younger stage of age. With an increasing age, there was a decrease in the positive trends of culture frequency. Mild AV cases were in abundance with the most repeated incidence of *Enterococcus faecalis* as an isolated organism in the patients of Aerobic Vaginitis (AV).

**Keywords:** *Lactobacillus*, *Enterococcus Faecalis*, Aerobic Vaginitis (AV) and *Escherichia Coli*.

**Corresponding author:**

**Dr. Saman Manzoor,**  
University Medical and Dental College,  
Faisalabad

QR code



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**INTRODUCTION:**

Abnormal Vaginal Discharge patients with associated complaints of irritation, valval burning or itching experience a diagnosis process of Vaginitis [2]. Vaginal mucosa inflammation is a frequent complain also referred as vaginitis which is a frequent complain of patients and accounts for more than ten million hospital visits every year [3].

Bacterial vaginosis, Trichomoniasis and Candidiasis are among the major reasons of vaginal discharge in ladies [2]. About seven to seventy percent of the females complain about the vaginal discharge without any definite diagnosed reason [2]. The issue lies in the problem that whether these are normal or abnormal micro-flora of the vagina or bacterial vaginosis. These abnormal flora forms also fall in the category of an intermediate flora as referred in few of the research studies or as full-blown bacterial vaginosis in few of the other research studies [4 – 6]. A non-defined abnormal flora is of very crucial importance in expecting women as it poses a pre-term delivery risk [4, 6].

It is difficult to explain all the clinical signs through Candida vaginitis, Bacterial vaginosis and Trichomonas vaginitis with the failure of the therapy and interesting results of few studies for the establishment of an association between rate of pre-term birth and bacterial flora forms. These abnormal vaginal flora forms are “intermediate flora” and this abnormality is “Aerobic vaginitis” [7].

AV is actually a lactobacilli flora disruption with the additional symptoms of inflammation and presence of scarce, composed of enteric pathogens or commensals and predominant aerobic microflora [8]. AV also relates with disturbed microflora type where facultative pathogens (Escherichia coli (E. coli), Group B streptococci (GBS), Staphylococcus aureus, Enterococcus species and Klebsiella pneumonia) replaces with lactobacilli aerobic. Vaginal ecosystem disruptions in the course of AV may also cause an increase in the pH (above 6), reduced lactate concentration and an increase in the concentrations of pro-inflammatory cytokines and leucocytes in the cases of vaginal discharge. Its common factors of presentation include dyspareunia with red vaginal inflammation and vaginal discharge of yellow colour [7].

Preterm delivery, chorioamnionitis and PROM during pregnancy has a strong association with an increased residual production of IL – I, VI & VIII which that has an association to AV [7]. To prevent the pre-term births is one of the primary challenges

for obstetricians. Higher chances of chorioamnionitis are present in the case of an earlier preterm labour initiation during gestation [9]. Increased infection in the course of gestation may also lead to maternal complications which include septic arthritis, sepsis and maternal respiratory distress [10].

In case of non-management of these infections, the health of the patient debilitates which can be harmful to the neonates as it causes infection especially in the women of reproductive age. Hence, this research aimed at the vaginitis frequency determination in the patients of reproductive age who visited the hospital.

**MATERIAL AND METHODS:**

Research chose a cross-sectional design to complete this research at Gynecology and Obstetrics Department of Sir Ganga Ram Hospital, Lahore (February to September 2017) on a total of one hundred female patients clinically suspicious for vaginitis after institutional approval and informed consent of the patients. In a laboratory setting research carried out Gram’ staining followed by blood agar inoculation, MacConkey and Chocolate agar with an incubation of thirty-seven Degree Celsius for the identification of organisms. We included all the patients of vaginal discharge in the age bracket of (15 – 45) years without any due consideration of gestational age. We did not include any patients presenting bacterial vaginosis, trichomoniasis and candidiasis, parenteral or oral antibiotic-treated cases within one month of time, Chlamydia trachomatis cervicitis and Neisseria gonorrhoea patients.

We took the detailed medical history of the patients keeping in view occupations, address, complaints (related pain, discharge type, odour etc.), predisposing factors, any previous history and present illness, past illness, family or personal history. We also considered the obstetrics history for pregnant cases. Every patient gave three HVS (High Vaginal Swabs) through swab insertion in the upper area of the vagina and before removal swab rotated for 30 seconds in the prescribed area for microbiological assessment [11].

Clinical staff used 1<sup>st</sup> swab for Gram’s staining, 2<sup>nd</sup> for lactobacilli detection through a microscope and visual increased leukocytes detection [12]. The researcher determined the score of AV through Donders’s criteria [7]. Clinical staff used the last swab in order to inoculate media for the culturing of aerobic bacteria (MacConkey agar, Blood agar and Chocolate agar) and analyzed the outcomes on SPSS software [13].

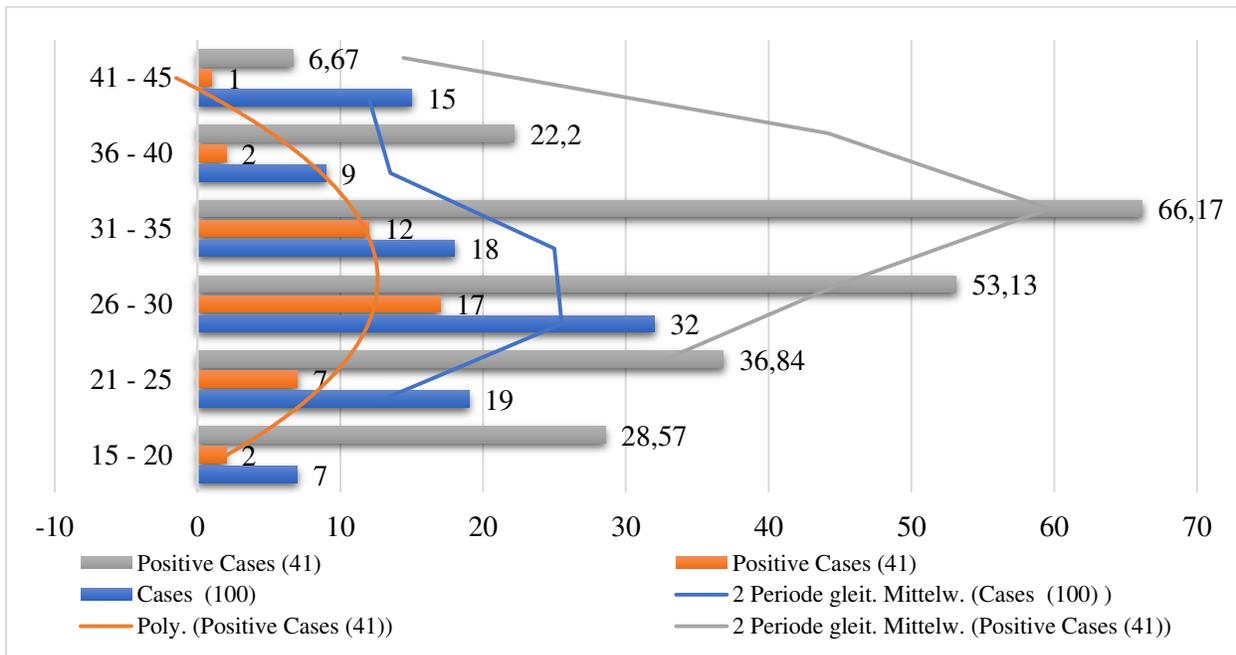
**RESULTS:**

A total of forty-one percent patients presented Aerobic Vaginitis (AV) frequency, especially the age group from twenty-six to thirty years. About seventy-eight percent of the patients had mild AV incidence. We reported *Enterococcus faecalis* as most repeated isolated organism in about (26.83%) patients,

*Escherichia Coli*, *Staphylococcus Aureus* and Coagulase Negative *Staphylococci* were other most repeated isolated organism with respective proportions of (21.95%), (12.2%) and (14.63%). Detailed outcomes analysis is as under (Table – I, II and III).

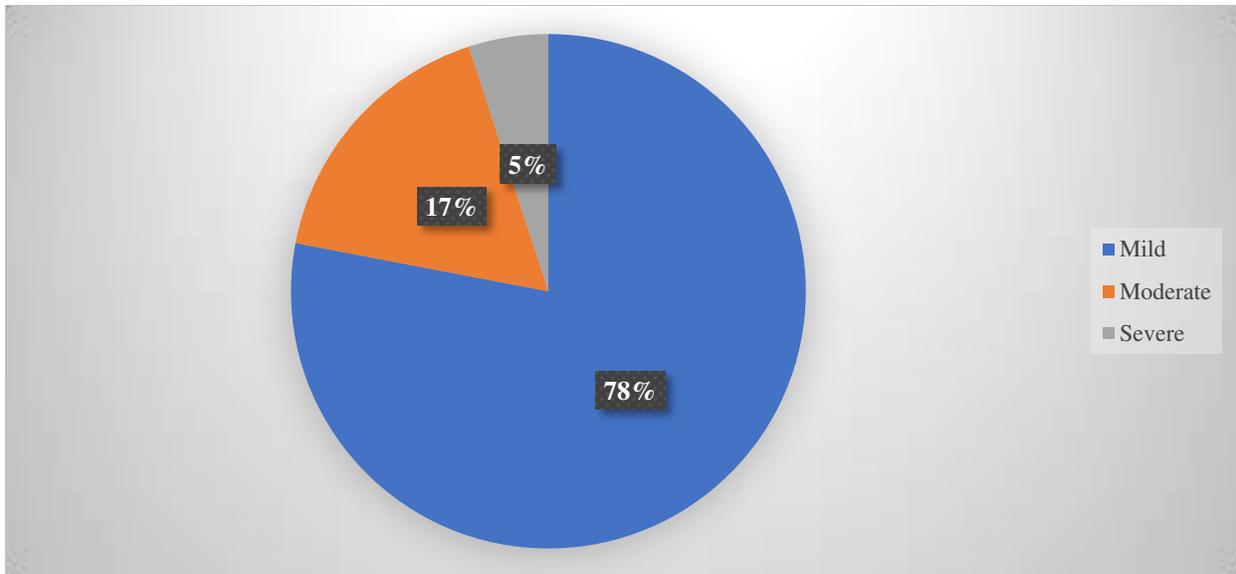
**Table – I:** Age wise distribution of patients with Aerobic vaginitis

Age Distribution	Cases (100)	Positive Cases (41)	
	Number	Number	Percentage
15 – 20 Years	7	2	28.57
21 – 25 Years	19	7	36.84
26 – 30 Years	32	17	53.13
31 – 35 Years	18	12	66.17
36 – 40 Years	9	2	22.2
41 – 45 Years	15	1	6.67



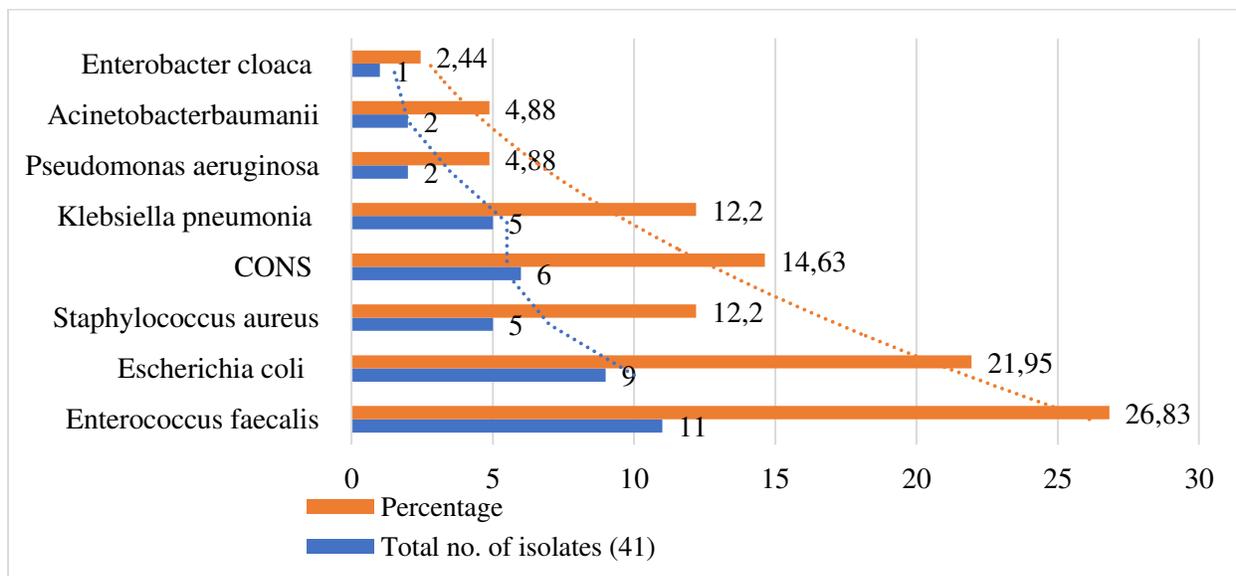
**Table – II:** Aerobic Vaginitis Severity

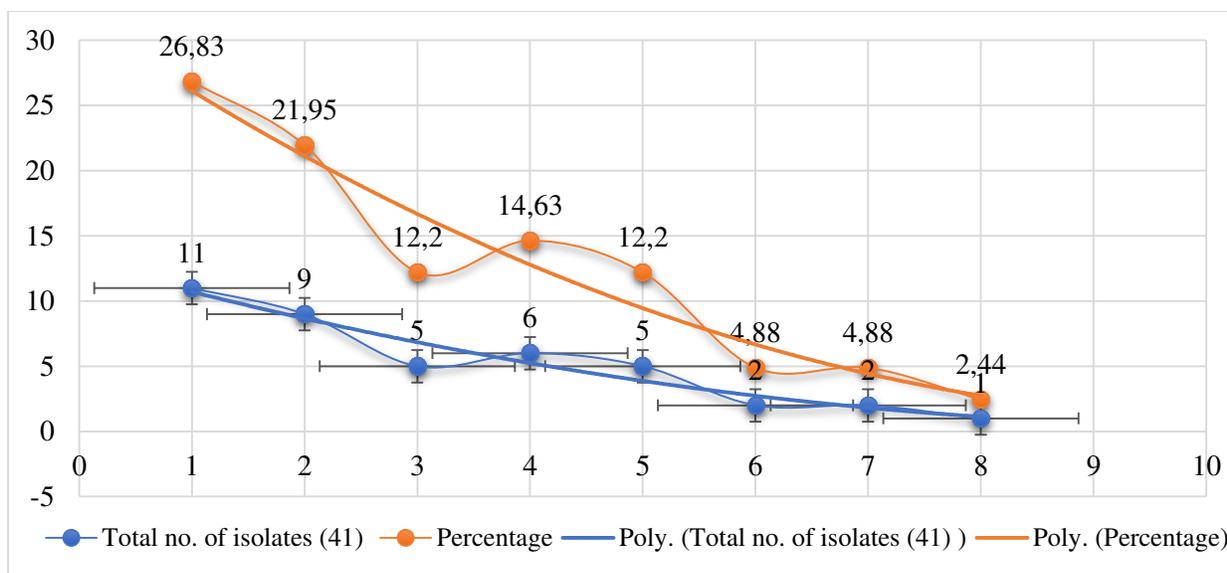
Severity	Number
Mild	78
Moderate	17
Severe	5



**Table – III:** Distribution of organisms isolated from AV cases

Organisms	Total Isolates (41)	Percentage
Enterococcus Faecalis	11	26.83
Escherichia Coli	9	21.95
Staphylococcus Aureus	5	12.2
CONS	6	14.63
Klebsiella Pneumonia	5	12.2
Pseudomonas aeruginosa	2	4.88
Acinetobacter Baumanii	2	4.88
Enterobacter Cloaca	1	2.44





### DISCUSSION:

This particular research aimed at the vaginitis frequency determination in the patients of reproductive age who visited the hospital. Our reported AV frequency is in accordance with the reported AV frequency of Mumtaz (41% vs 38.01) [14]. Ayengar also reports a positive culture of fifty-seven percent in his research study [15]. Ling and Razzak respectively reported a higher incidence of AV with respective proportions of 80% and 95.45% [16, 17]. Fan A, Donders and Donders respectively reported AV as 23.74%, 7.9% and 8.3 % [1, 7, 18].

An age group of (26 – 30) years presented higher AV incidence in our research which is the same as reported by Khan and Mumtaz in their respective studies [14, 19]. We reported mild, moderate and severe AV cases as 78%, 17% and 5%; which is the same as reported by Sobel JD and Zodzika J [20, 21]. Prevalence of AV isolated organism was such as *Enterococcus faecalis*, *Escherichia coli*, *Staphylococcus aureus* and Coagulase-negative staphylococci with respective proportions of 26.83%, 21.95%, 12.2% and 14.63%; whereas, Khan reported *Enterococcus faecalis* as most repeated pathogen isolate (31%) [19]. Tariq reported *E. Coli* and *Enterococcus* with respective proportions 10.2% and 14.7% as most repeated bacterial vaginal pathogens [22]. Fan A reported seventy-two single cases of AV with frequently isolated bacteria such as *E. coli*, *E. faecalis* and CONS [1]. Few researchers also reported the presence of *K pneumonia* isolation among AV cases [13, 15]. Chaudhary found that all the genital tract driven pathogens with PROM were largely *Klebsiella pneumonia* and *Staphylococcus aureus* [23].

There was a respective proportion of *Acinetobacter*

*baumanii* and *Pseudomonas aeruginosa* having their share as 3.33% and 5%. Mumtaz also reported them as vaginal pathogens [14]. These bacteria were present in the women who complained about vaginal discharge offensive odour; above and beyond the non-pregnant women using the intrauterine device. This bacterium is also very much opportunistic in the vagina. There is an increase in such microorganism due to the variations in the environment of the vagina. Other research studies also report about the isolation of such bacteria from the vaginitis patients [24].

### CONCLUSION:

Our outcomes reflected higher vaginal infection frequency in the sexually active females who were at the younger stage of age. With an increasing age, there was a decrease in the positive trends of culture frequency. Mild AV cases were in abundance with the most repeated incidence of *Enterococcus faecalis* as an isolated organism in the patients of Aerobic Vaginitis (AV).

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