

Microorganism Distribution that Causes Abortion in Females of Fallujah City

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Abstract

The research included the study of microbiological content in the reproductive system and urinary tract infections for abortions cases in the city of Fallujah. For this purpose, 121 swabs were taken, including 50 swabs of the genital system (27 Vaginal and 23 Endo cervical swabs) and 71 swabs of urine. The result refer to that only 27 samples gave negative bacterial growth, while the other 94 samples showed growth of more than one species of bacteria on different media. The bacterial population isolated from the urine was highest (81.7%), followed by vagina (74.1%) and the endo cervical (69.6%). The results showed that the ratios of the isolated bacterial samples were *Escherichia coli* (54.4%), *Streptococcus agalactiae* (17%), *Staphylococcus aureus* (12%), *Klebsiella* (8.5%), *Pseudomonas aeruginosa* (5.3%), *Proteus* (1%) and *Candida albicans* (1%). The *E. coli* was the most common type bacterial isolates. Antibiotic sensitivity tests against 24 antibiotics were reveal that bacteria *Escherichia coli* have multiple resist against different antibiotics, most isolates were highly resistant to Aztroenam followed by cefotaxime and ciproflaxime respectively, while their resistance to other antibiotics varied. The results also showed that *Proteus* which isolated from urine samples and *Candida albicans* which isolated from vaginal specimens were the lowest percentage, where only one isolate was obtain for each and the *Candida abicans* were resistant to all of different antibiotics used in this study.

Keywords: Females; abortion; Microorganism; Health

Introduction

Women who infected with bacteria during pregnancy period to risk of miscarriage or childbirth before the pregnancy is complete⁽¹⁾, most of these cases caused by bacterial genital tract infection⁽²⁾.

The genital tract, especially the vagina, may be infected with virulance microorganisms, such as *Gardnerella vaginalis*, group B streptococci, *Staphylococcus aureus*, *Ureaplasma urealyticum* and *Mycoplasma hominis*, which can displace Lactobacilli

that can change vaginal pH from 3.8 to 7^(3,4). Bacteria of genital tract are found in 40%-50% of women of reproductive age which causing bacterial vaginosis^(5,6), which diagnosed by using microscopy examination of vaginal swab samples and treated with appropriate antibiotics such as metronidazole⁽⁷⁾. Also, infection of the bacterial genital tract during pregnancy periods is not only risk to the mother but also to the neonate for example the infection with *Streptococcus agalactiae* can cause severe pneumonia, meningitis in neonates which often causes neonatal sepsis⁽⁸⁾ and a study showed that *Streptococcus agalactiae* premature rupture of membranes, leading to miscarriage or premature birth and a series of adverse pregnancy effects⁽⁹⁾. So Bacterial vaginosis has been closely related to abortion and premature birth^(10,11,12). Also *E. coli*, which main causes of urinary tract infections, is one of an important factors in abortions and premature births⁽¹³⁾.

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A recent study recommended further research to clarify whether bacterial infections increase the risk of miscarriage and whether early diagnosis and treatment could improve reproductive outcomes⁽¹⁴⁾ of miscarriage in women of Fallujah city.

Materials and Method

Collection Samples: These study was conducted at in Fallujah city, Samples were collected monthly from January 2019 to April 2019. Women who were booked at gynecologists in antenatal clinics, during the study period were randomly selected, after that the Pregnant women receiving antibiotic treatment within 72 hours of days were excluded because of the fact that antibiotics should prevent or destroy pathogens,

Sampling Technique: One hundred (121) pregnant woman during the research period that either had any of the symptoms suggestive of urinary tract infections or without any symptoms were recruited into the study upon informed consent. Sample were divided in to three section:

1. **urine culture examination (71) sample:** Urine collection by sterile universal containers was given to the pregnant woman and midstream to avoid contamination, urine specimens collected and carried immediately to the microbiology unit for sample cultured and Microscopy.
2. High vaginal swab (27) sample.
3. Endocervical swab (23) sample.

Culture Technique: All the samples were inoculated

Into Brain – Heart Infusion broth was incubated at 24 hours, 37 C, after that from the growth inoculated Blood agar, Mannitol salt agar and MacConkey agar by using calibrated loop technique⁽¹⁵⁾. by streaked way may be obtained the appropriate way to the single-cell colony, The plates were incubated for 24 hours at 37 0 C⁽¹⁵⁾

Identification of Bacterial Isolates: Complete identification of each bacterial isolates was based on a cultural examination, morphological examination, and biochemical characterization

Antibiotic Resistant: Antimicrobial susceptibility was performed by modified Kirby Bauer

Disk Diffusion technique⁽¹⁶⁾, used multiantibiotic disc to the detection all strain that isolated and know ability effect on strain by sensitivity or resistant for antibiotic.

Results and Discussion

the study conducted on randomly pregnant women sample in Fallujah city, From a total of 121 sample included urine, Vagina swabs, and endocervical swabs there were only 27 samples gave negative bacterial growth, while the number of bacterial growth were 94 isolates, showed more than one bacterial species on different culture media.

Prevalence rate of urine isolates were 81.7% while the vaginal isolates were 74.1% and endo cervical isolates were 69.6% from a total of positive specimens. Table (1).

Table (1): Distribution of different swabs which gave negative and positive results for bacterial inoculation on different media.

Patients	Total No. of specimens	Positive specimens	Negative specimens	Prevalence of Positive Specimens
Urine swabs	71	58	13	81.7%
Vaginal swabs	27	20	7	74.1%
Endo cervical swabs	23	16	7	69.6%
Total	121	94	27	

The results revealed there were six genera of bacteria were identified in addition to one species of yeast, which include *Escherichia coli* 54.4%, *Streptococcus agalactiae* 17%, *Staphylococcus aureus* 12.8%,

Klebsiella 8.5%, *Pseudomonas aeruginosa* 5.3%, *Proteus* 1%, and *Candida albicas* 1% respectively. Table (2).

Table (2): Bacterial species which isolated from urine, vaginal and endo cervical swabs and its Percentage

Bacterial Species	Urine		Vaginal		Endo cervical		Total	
	No.	Percentage (%)	No.	Percentage (%)	No.	Percentage (%)	No.	Percentage (%)
Staphylococcus aureus	6	10.4%	6	30%	0	0%	12	12.8%
Streptococcus agalactiae	6	10.4%	4	20%	6	37.5%	16	17%
Escherichia coli	40	69%	6	30%	5	31.3%	51	54.4%
Proteus	1	1.7%	0	0%	0	0%	1	1%
Klebsiella	3	5.1%	2	10%	3	18.7%	8	8.5%
Pseudomonas aeruginosa	2	3.4%	1	5%	2	12.5%	5	5.3%
Candida albicans	0	0%	1	5%	0	0%	1	1%
Total	58	100%	20	100%	16	100%	94	100%

The causes of miscarriage in many cases are unknown. However, approximately 50% of early miscarriages showed abnormal chromosomal aberrations in the aborted fetus as changes in the structures or number of chromosomes⁽¹⁷⁾. Studies have shown that 78% of 101 histopathological samples of miscarriages were infected with bacterial (chorioamnionitis) compared with control samples which were uninfected⁽¹⁸⁾.

Our results agree with the findings of ⁽¹⁹⁾ which found that the staphylococcus was predominant in urogenital diseases of pregnant women with threatened abortion also *Streptococcus agalactiae* was isolated in 11.8 %, While it was contrary to what was obtained from isolates of *E. coli*, where 69% was obtained in the urine while the researcher got 19%⁽²⁰⁾.

Researcher⁽²¹⁾ found that induced abortion associated with group B *Streptococcus* (known as *Streptococcus agalactiae*) colonization. So the presence of these species in the genital tract could be one of the causes of abortion and suggesting that colonization of *Streptococcusagalactiae* in the genitourinary tracts may could be the risk factor for early-onset diseases⁽²²⁾, and the colonization of these species in pregnant women is also an important cause of premature rupture of membranes, advanced miscarriage, premature birth and a series of disadvantage pregnancy outcomes⁽²³⁾

Also the researcher⁽²⁴⁾ founded that bacterial vaginosis not only related with abortion (spontaneous or induced), but also are associated with an increased risk of infertility.

The researcher found the urogenital infections are the most important health problems affecting (in)

pregnancy women causing (of) cystitis, miscarriage, infertility and possibly death⁽²⁵⁾.

The vaginal flora play essential role for reduction of pH resultant acid provided protection against infection but an overgrowth of bacteria especially in vagina reduction or cause absence of vaginal flora ⁽²⁶⁾ which often associated with late miscarriages ⁽²⁷⁾. Also the ⁽²⁸⁾ confirmed the role of the bacterial vagina (BV) as a predictor of miscarriage after 13 weeks' gestation.

And our results were agreement with ⁽²⁹⁾, who found that the mostly bacterial species were *Escherichia coli* which account to 80% to 85% the infection of UTI followed by *Staphylococcus* species that constitutes to 10% to 15%. of the infection. In addition to bacterial species *Klebsiella*, *Pseudomonas*, *Proteus* species which plays a minor role in the infection. Therefore, the untreated infection of UTI during pregnancy may lead to premature labor or result in miscarriages which causes to infant's death.

The⁽³⁰⁾ isolated many species of bacteria included: *Chlamydia trachomatis*, *Enterococcus*, *Escherichia coli*, *Gardnerella vaginalis*, *Klebsiella pneumoniae*, *Mycoplasma hominis*, *Neisseria gonorrhoeae*, *Staphylococcus*, and *Streptococcus* from patients assessed for chronic endometritis. And the prevalence of chronic endometritis in infertile patients estimated to 2.8%-39% and as high as 60% diagnosed with unexplained abortion⁽³¹⁾.

The vaginal pathogens could passage to the cervix, through dilatation of the cervix and the loss of the cervical mucus plug during the miscarriage resulting in the infection of the endometrium and increased vascular

permeability due to bacterial infections of endometrium allow the passage of the pathogen into the systemic circulation which causes of septic shock syndrome and the *Klebsellia* play important role in that case⁽³²⁾ and the researcher ⁽³³⁾ found there were association between *Escherichia coli* and miscarriage in a study conducted on some cases in Nigeria

With regard to *Candida albicans* infections during pregnancy which association of chorioamnionitis, the researcher ⁽³⁴⁾ found that it can lead to late abortion.

The results of antibiotics sensitivity tests against 24 antibiotics showed there were multi resist for *Candida albicans* which isolated from vagina where was resist in 100% ratio to all antibiotics used in this study, followed by *Proteus*, which resisted 8 antibiotics in percentage 100% included cefipime, cefotaxime, doxycycline, aztroenam, nalidixic acid, imipenem, norfloxacin and levofloxacin. Whereas the *Pseudomonas aeruginosa* was resist to aztroenam, nalidixic acid and norfloxacin in 100% and resisted in 83.3% against cefotaxime, ciproflaxine, ceftriaxone and nitrofurantoin, while was less resistance against the other antibiotics where the resistance ranged from 66.7% to 0%.Figure (1).

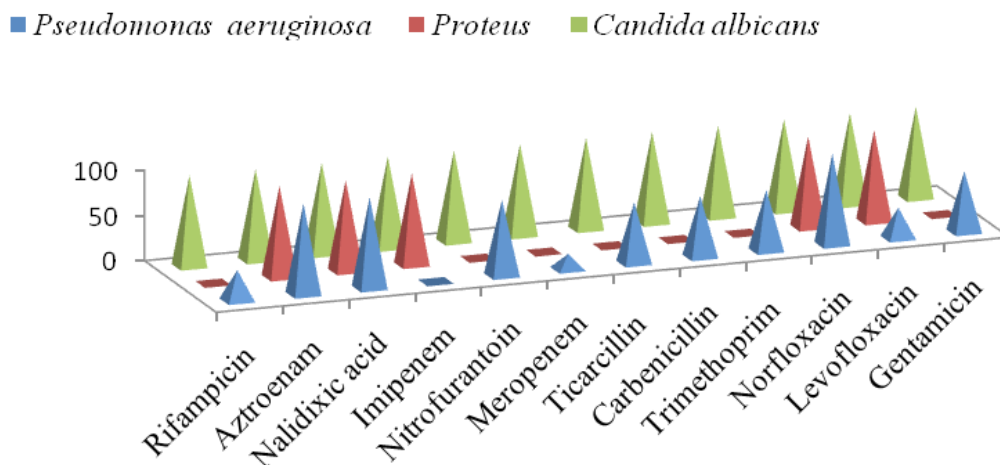


Figure (1): Antimicrobial susceptibility of *Pseudomonas aeruginosa*, *Protus* and *Candida albicas*.

The *E.coli* resisted against cefotaxime, ceftriaxone and aztroenam in 92.5%, 85.8% and 85% respectively while it was low resist to the other antibiotics ranged between 69.5% and 2.5%.*Klebsiella*isolates were resisted against aztroenam in 100% and against gentamicin in 89% but moresusceptibility to the others.

The obtained results that *Klebsiella*, *Streptococcus agalactiae*, *Escherichia coli* and *Staphylococcus aureus* showed highly resist against Aztroenam of in percentage

(100%, 88.7%, 85% and 83.5%) respectively. The determination of resistance demonstrated that *Escherichia coli* had been resisted ciproflaxine in 92.5% and ceftriaxone in 85.8% while *Staphylococcus aureus* was resistance to the Nalidixic acid in 100%. and the results apparent that resistance rates in all bacterial species varied between moderate resistance and sensitive against other antibiotics which used in this study. Figure (2).

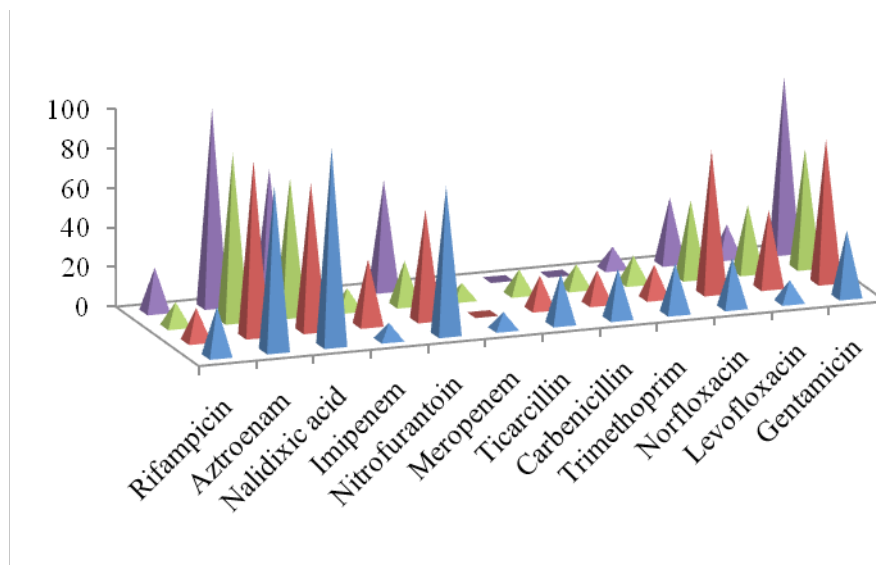


Figure (2): Antimicrobial susceptibility of *Staphylococcus aureus*, *Streptococcus agalactiae*, *Escherichia coli* and *Klebsiella*

These results disagree to findings of⁽³⁶⁾ who found that bacterial vaginosis isolates were high level of sensitivity to Norfloxacin (75.6 %), ciprofloxacin (79.6 %) and gentamicin (77.6 %) whereas our results were opposite these results most of the bacterial isolates were resistance to the Norfloxacin (25%-100%) and but agree with resistance of gentamicin which were (33.5% - 100%) except the *Proteus* was sensitivity.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

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