Prevalence of Bacterial Vaginitis in Women with Recurrent Abortion in Comparison with Normal Pregnant Women

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Abstract

Across-sectional study was done on a total of 80 deep vaginal swabs (40 women with recurrent abortion and 40 pregnant women as control group) were collected from the September 2019 to the end of November 2019 from inpatients and outpatients women attended to Kirkuk general hospital to evaluate the prevalence of vaginitis due to bacterial causes and its relation with abortion in pregnant women. vaginal swabs were inoculated in bacterial media whose were prepared and sterilized according to the manufacturer's instruction. The prepared media were used for isolation, determination of the viable count, identification and susceptibility testing these media were carried out after being solidified. Swabs was inoculated onto MacConkey, nutrient and blood agars. Then the inoculated plates were incubated at 37°C for 24 hr. The included 40 women with recurrent miscarriage with age range (20-44 years), the study showed that 12 of 40 were within the age group 30-39 years and 12 were below 30 years with mean age (31.6 years) and their husbands mean age (35.43 years) and 65% of cases were rural. There was 60% of cases were with history of 3 miscarriage and 18.75% were 4 miscarriage. The study also revealed that majority of cases were parity 3-6. The study also indicated that majority of cases have history of miscarriage in the 1st trimester in pregnancy. The study demonstrated that 55% of women with recurrent abortion have positive HVS culture comparing with 48% of pregnant women (control group). The study showed that 77.27% of women had aborted in the 1st trimester of pregnancy and the lowest rate of abortion 3% was in the 3rd trimester. The study revealed that highest rate of isolated bacteria from the HVS culture of aborted women was *Gardenellavaginalis* (36.36%), E. coli (27.27%) *S. aureus* (22.73%) and the higher rates of isolated bacteria from pregnant women were 50%% for *E coli*.

Keywords: *Bacterial vaginitis; Gardnellavaginosis; Recurrent abortion; Pregnancy.*

Introduction

Vaginitis is the most common gynecological infection among women of fertile age [(1)]. Bacterial vaginosis (BV) comprises the 50% of the all cases of vaginitis[(2)]. To understand the pathological events related to vaginitis, it is necessary to understand the normal vaginal flora. In normal vaginal flora, there are *Lactobacillus* species in 95% and facultative anaerobic and anaerobic microorganisms, including: *Gardnerellavaginalis*, *Staphylococcus epidermis*, *Mycoplasma hominis*, *Streptococcal* species, *Bacterioides* species, *Prevotellabivius*, *Peptostreptococci* species, in 5%[(3)]. In most cases of BV, the predominant microbe is the facultative anaerobe *Gardnerellavaginalis.* However, evidence from recent studies of the pathogenesis of BV suggests that this bacterium forms a biofilm in the vaginal epithelium that serves as a "scaffolding" to which other bacterial species adhere in a symbiotic fashion, colonizing the vagina[(4)]. Though asymptomatic in at least half of affected women, thispolymicrobial condition can produce a thin, white, homogenous discharge with a distinct "fishy" odor[(5)]. The changes in the vaginal flora seen in BV are associated with serious sequelae, such as preterm delivery, spontaneous abortion, postpartum endometritis, and increased susceptibility to HIV and other sexually transmitted infections[(6,7)]. The aim of this study was to evaluate the prevalence of vaginitis due to bacterial causes and its relation with abortion in pregnant women.

Materials and Method

Across-sectional study was done on a total of 80 deep vaginal swabs (40 women with recurrent abortion and 40 pregnant women as control group) were collected from the September 2019 to the end of November 2019 from inpatients and outpatients women attended to Kirkuk general hospital. Collection of vaginal swabs included:

1. The swab package was partially opened.
2. Carefully the swab was inserted into vagina about 2 inches (5 cm) past the introitus and gently rotated for 10 to 30 seconds.
3. When the swab touched the vagina walls and moisture and absorbed the moisture, it was withdrawn without touching the skin.
4. Swabs was delivered to the laboratory within 1 hour of collection.
5. The swabs samples were cultured in blood agar and MacConkey agar for 24 hour[8].

Media were prepared and sterilized according to the manufacturer's instruction. The prepared media were used for isolation, determination of the viable count, identification and susceptibility testing these media were carried out after being solidified. Swabs was inoculated onto MacConkey, nutrient and blood agars. Then the inoculated plates were incubated at 37°C for 24 hr.

Results

The included 40 women with recurrent miscarriage with age range (20-44 years), the study showed that 12 of 40 were within the age group 30-39 years and 12 were below 30 years with mean age (31.6 years) and their husbands mean age (35.43 years) and 65% of cases were rural. There was 60% of cases were with history of 3 miscarriage and 18.75% were 4 miscarriage . The study also revealed that majority of cases were parity 3-6. The study also indicated that majority of cases have history of miscarriage in the 1st trimester in pregnancy, Table 1.

Table 1: General characteristics of women with recurrent miscarriage

Characteristics	Aborted women (n:40)
<30 years	12
30-39	12
≥ 40	6
Mean (year)	31.6
Mean age of husbands	35.43
Rural	26
Urban	14
Miscarriage No.	
3	20
4	10
5 and more	10
Parity	
None	7
1-2	14
3-4	21
5-6	23
>6	15

The study demonstrated that 55% of women with recurrent abortion have positive HVS culture comparing with 48% of pregnant women (control group), Table 2.

Table 2: Distribution of HVS culture in recurrent aborted women and the control group.

Results of vaginal swab culture	Study Groups			
	Recurrent Abortion Women		Pregnant Women (Control)	
	No.	%	No.	%
Pathogenic bacteria	22	55	10	25
No bacterial infection	12	45	30	75

P. value < 0.01

The study showed that 77.27% of women had aborted in the 1st trimester of pregnancy and the lowest rate of abortion 3% was in the 3rd trimester, Table 3.

Table 3: Distribution of aborted women with HVS positive according to Trimester of abortion

Trimester of abortion	No.	%
1st trimester	17	77.27
2nd trimester	4	18.18
3rd trimester	1	4.55
Total	**22**	**100**

Figure 1 shows that the highest rate of aborted women have suffer from abortion twice number during their marriage life.

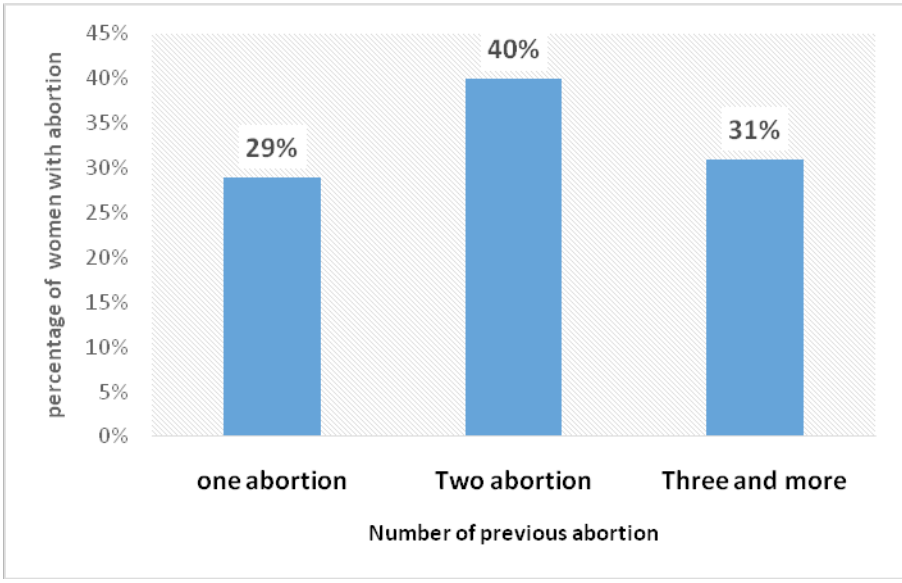

Figure 1: Distribution of aborted women according to number of abortions.

The study revealed that highest rate of isolated bacteria from the HVS culture of aborted women was *Gardenellavaginalis* (36.36%), E. coli (27.27%) *S. aureus* (22.73%) and the higher rates of isolated bacteria from pregnant women were 50%% for *E coli,* Table 4.

Table 4: Distribution of isolated pathogenic bacteria among study groups.

Isolated bacteria	Aborted women		Control women	
	No	%	No	%
Gardenellavaginalis	8	36.36	1	8.33
Staphylococcus aureus	5	22.73	3	25
E. coli	6	27.27	6	50
Klebsiellaspp	3	13.64	2	16.67
Total	22	100	12	100

Discussion

In agreement with these finding, Sundari *et al* [9] reported in their study that the majority of the sample was reported at first trimester of pregnancy. This result is in agreement with the study of Hassan *et al* [10] and Ali [11] who reported a similar results. Al-dorri[12] found in a study that aborted pregnant women with *Listeria* infection most common in 1st trimester (< 12 wk) was 54(60.68%) and at late (12–20 wk) was 35(39.32%). Jamshidi *et*

al [13] who reported pregnant women with abortion at gestational age of early (< 12 wk) was 54(60.68%) and at late (12–20 wk) was 35(39.32%). Ra'ad *et al* [14] in a study of vaginitis in married women in Tikrit city found that women with 1st trimester of abortion recorded the highest rate of abortion. In present study, the overall prevalence of vaginal infections (57%) was coherent with several studies done earlier. A study done in Kirkuk found that 33.2% of women with recurrent abortion have positive HVS culture[15]. Chambers[16] displayed that 34.7 % of women in India had positive HVS culture. Go VF *et al* [17] revealed that, the prevalence of vaginal infection in Vietnam was 49.5 %. Bahram *et al* [18] found that HVS were positive in 27.6% Iranian women. This variation might be methodology difference in isolation and identification of etiologies of vaginal infections. Moreover, environmental factors and difference on the actual study participants might also explain the above discrepancy. Manges *et al*[19] demonstrated that the most prevalent *G. vaginosis* bacteria were was with rate (45.61%). The study was inconsistence with a study done in Erbil by Mohammed[20] who found a high percentage (46.21%) of *E coli* in his study. This may be due to the differences of the sites of swabs being taken from the hospital as a whole in Erbil or may be explained by the level of health awareness of both, patients and health staff in different communities [21]. Hayat *et al*[22] and) found that causative organisms of vaginitis were *E. coli* in less than one-third of cases followed by *Klebsilla* less than one quarter and more than 5% were Proteus. Other studies denoted that *G. vaginosis* and *S. aureus*may just be organisms causing local vaginal infection as they did not occur in the endocervix and may not have been responsible for the ascending upper genital tract infection in septic abortions. The result of the current study was supported by several studies done earlier. Carlson *et al*[23] and Yong *et al*[24] presented that women who suffer from spontaneous abortion are in 1st trimester and 2nd trimester while some of the women were multigravida had previous stillbirth, preterm birth, multiple birth, and previous miscarriage.

Conclusion:

Bacterial vaginosis was common in aborted women and *S. aureus* was the most isolated species followed by *G. Vaginosis*and *E. coli*.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

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