

Incidence and types of vaginitis in pregnant women attending routine antenatal care at Tanta University Hospital: a cross-sectional study

Abstract

Objectives: To determine the incidence and types of vaginitis in pregnant women at early third trimester and the impact of vaginitis on pregnancy outcome.

Patients and methods: Pregnant women at early third trimester (28-32 weeks) attending for antenatal care unit were evaluated by history, examinations, and ultrasound for fetal assessment. Vaginal swabs were taken from posterior fornix for bacteriological and parasitological examination to determine nature and type of vaginitis. Patients either with evident vaginitis (Group I) or without vaginitis (Group II) were followed up till delivery. Neonatal problems were also assessed.

Results: The incidence of vaginitis at Tanta University hospitals was 51.57%. The incidence is more in patients with low education, non-occupied and those from rural areas. Bacterial vaginitis was the most common type (30.63%). Preterm labour occurred in 33 (16.75%) in vaginitis group compared to 10 (11.76%) in no vaginitis group. PROM occurred 60 (30.46%) in vaginitis group while occurred in 15 (17.67%) in no vaginitis group.

Conclusion: Vaginitis has a greater incidence in pregnant women attending antenatal care at Tanta University hospitals and is linked to some undesired outcomes. Treatment of vaginitis in pregnancy should be advice to reduce these poor outcomes.

Keywords: Incidence, vaginitis, pregnancy, outcomes

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Introduction

The incidence of vaginitis during pregnancy increases more and more due to the physiological changes in pregnancy. These changes include high levels of estrogen and progesterone hormones, lowering of immunity of pregnant women, alteration of vaginal microbiome, increased glycogen storage in vaginal cells and alteration in vaginal PH. Moreover poor hygiene, use of vaginal douching and sexual contact all predispose to the high incidence of vaginitis during pregnancy.^{1,2}

These changes result in congestion and hypertrophy of vaginal mucosa, which consequently allow more growth of anaerobic bacteria and other pathogenic microorganisms within the vagina.^{3,4} Moreover, there are hypertrophy of cervical gland and proliferation of cervical cells which in turn decreases in B lymphocyte numbers and reduces the local resistance of cervix and vagina to infectious agents.^{5,6} Vaginitis has other causes, such as allergic vaginitis to vaginal sprays, douches, spermicides, soaps, detergents, and fabric softeners. These products can cause burning, itching, and discharge, even if there is no infection. Vaginitis may be due to foreign bodies as pessary or may be of mixed etiologies at the same time.⁷ Increasing opportunities of infection lead to inflammation in the vagina and cervix, therefore increasing the risk of fetal or neonatal morbidity and higher perinatal mortality.^{8,9}

Vaginitis or inflammation leads to release of inflammatory mediators consequence of the activation of neutrophils provoking an

increase in defensins principally IL-8 in amniotic fluid.¹⁰ This will share in the pathogenesis of preterm labour with its poor sequelae or by causing premature rupture of membranes (PROM) with congenital fetal and maternal infections. Prematurity may lead to a number of health challenges, including low birth weight.^{11,12} Also vertical transmission of vaginitis inducing microorganisms may lead to severe respiratory problems in new born infants.¹² This study is designed to estimate incidence of vaginitis in pregnancy and the effects of vaginitis on the outcomes of pregnancy in the enrolled patients.

Patients and methods

Study design and settings: A cross sectional study. This study was conducted at Obstetrics and Gynecology, Microbiology and Medical Parasitology Departments of Tanta University, in the period from January, 1, 2017 to December, 31, 2018.

Patients: The enrolled patients were selected from the antenatal unit of Department of Obstetrics and Gynecology, Tanta University. Patients were selected according to inclusion and exclusion criteria. The inclusion criteria were: (i) pregnant women at early third trimester 28-32 weeks, (ii) singleton living baby, (iii) patients with normal BMI (iv) patients with no previous treatment of vaginitis in current pregnancy. The exclusion criteria were: (i) patient carrying malformed or dead baby, (ii) patients receiving local or systemic treatments for vaginitis in the current pregnancy, (iii) patients with pregestational or gestational diabetes mellitus, (iv) anemic patients,

(v) patients with history of vaginal bleeding in the preceding two weeks, (vi) patients with vaginal pessary during current pregnancy, and (vii) patients under steroid or antibiotic therapy.

Procedures: All patients were examined in the lithotomy position with good light illumination and under complete aseptic techniques.

Specimen collection: A sterile speculum was introduced to visualize the posterior fornix. Three high vaginal swabs (HVS) were taken and sent to Clinical Pathology Department for detection of any infection and determining the causative organism.

Bacteriological examination: The first swab was examined by naked eye for color, viscosity, and odor. The second swab was utilized in microscopic examination after addition of a drop of 0.9% saline using both low (10x) and high (40x) power. A drop of 10% KOH was added to the slide to assess presence of pseudohyphae or yeast. Addition of 10% KOH may yield fishy odor. Vaginal pH to be assessed also in this smear.

Parasitological examination: The third swab was kept moist by immediate immersion in phosphate-buffered saline to be examined for trichomonas vaginalis. The swab was examined microscopically 20 fields under 400 x magnifications to detect active organism.

Methods

After Clinical Pathology results, patients were divided into 2 groups, group I with vaginitis and group II without vaginitis. Follow up of patients in both groups were conducted till delivery. Recording of abnormal events as preterm labour or PROM, gestational age at delivery, mode of delivery and assessment of neonatal conditions as weight, congenital infections, respiratory problems and need for incubation were done.

Ethical considerations

Before starting the study, an approval from the local Ethical Committee of Faculty of Medicine, Tanta University was obtained. All aspects of this study were completely explained for all patients and a written informed consent was taken from them before beginning of the study.

Statistical analysis

Statistical analysis will be done using SPSS program, version 20. Percentages, and χ^2 (chi square) test are used for qualitative data. Mean±SD (Standard Deviation), t-test used for quantitative data. $P < 0.05$ is considered significant.

Results

A total of 430 patients were recruited in this study. Forty eight patients were excluded either not meeting inclusion criteria (n=41) or refusing to participate (n=7). The flow of cases throughout the current study is illustrated in Figure 1. The demographic data of enrolled patients (n=382) was demonstrated in Table 1. The majority of patients were from rural areas (64.14%), of lower educational level (50.78%), non-occupied (61.78%), Muslims (84.55%). Regarding presentations of patients, most of them were symptomatic (63.35%). The main symptoms were vaginal discharge, pruritus, dyspareunia and vaginal soreness.

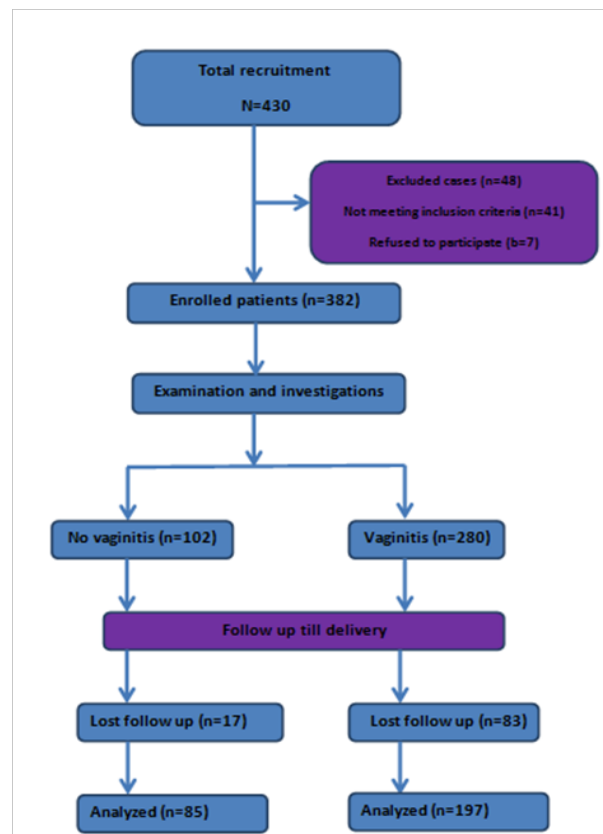


Figure 1 Flow of cases throughout the current study

The incidence of vaginitis in the enrolled patients was 51.57%. The most frequently met type was bacterial vaginitis (117/197), followed by fungal vaginitis (62/117) and lastly parasitic or Trichomonas vaginalis (18/197) as shown in Figure 2. The organisms detected in the enrolled patients were demonstrated in Table 2. The relations of demographic data to incidence of vaginitis are presented in Table 3. There is significant difference in gestational age at delivery between vaginitis and no vaginitis group where gestational age in vaginitis group was 36.48±1.23 weeks and in no vaginitis group was 37.11±2.29 weeks. The incidence of preterm labour was 33 (16.75%) in vaginitis group while it was 11.76% in no vaginitis group. PROM was noticed in 60 (30.46%) in vaginitis group while occurred in 15 (17.67%) in no vaginitis group.. Other outcomes are presented in table 4.

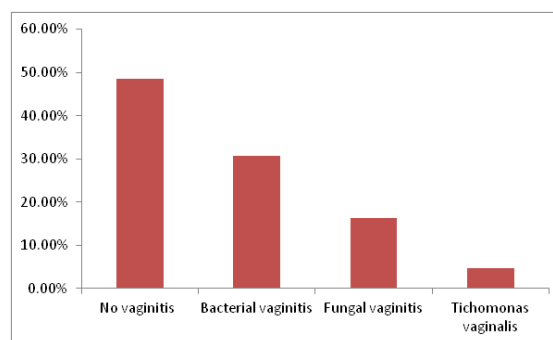


Figure 2 Incidence and types of vaginitis in the current study.

Table 1 Characteristics of enrolled patients in the current study (n=382)

	Mean	±	SD
Age (years)	29.92	±	4.56
Gravidity	3.44	±	2.13
Parity	2.71	±	0.45
BMI	23.62	±	2.02
Gestational age at initial visit (weeks)	30.47	±	1.18
Residence (n,%)			
Urban	137		35.86%
Rural	245		64.14%
Educational level (n,%)			
Non-educated	88		23.04%
Lower Education	194		50.78%
Higher Education	100		26.18%
Occupation (n,%)			
Non-occupied	236		61.78%
Occupied	146		38.22%
Religion (n,%)			
Muslims	323		84.55%
Christians	59		15.45%
Symptoms of vaginitis (n,%)			
Asymptomatic	140		36.65%
Symptomatic	242		63.35%

Table 2 Incidence and types of vaginitis in the current study (n=382)

	Number	Percentage (%)
No vaginitis	185	48.43%
Vaginitis	197	51.57%
Bacterial vaginitis	117	30.63%
Bacterial vaginosis	77	20.16%
<i>Chlamydia trachomatis</i>	12	3.14%
<i>Staph. Aureus</i>	7	1.83%
<i>Streptococcus species</i>	13	3.40%
<i>Escherichia coli</i>	8	2.09%
Fungal vaginitis	62	16.23%
Parasitic vaginitis (<i>Tichomonas vaginalis</i>)	18	4.71%

Table 3 The relation of demographic data to incidence of vaginitis

Parameter	Percentage
Residence	
Urban	12.36%
Rural	87.64%
Educational level	
Non-educated	73.79%
Lower Education	16.08%
Higher Education	10.13%
Occupation	
Non-occupied	81.72%
Occupied	18.28%
Religion	
Muslims	64.15%
Christians	35.85%

Table 4 Follow up results of the enrolled patients (n=300)

	Vaginitis group (n=197)	No vaginitis group (n=85)	T-test	P-value
Gestation at term	36.48±1.23	37.11±2.29	3.070	0.002*
Adverse pregnancy outcomes				
No adverse outcomes	104 (52.79%)	60 (70.59%)	4.881	0.027*
Preterm labour	33 (16.75%)	10 (11.76%)	0.637	0.424
PROM	60 (30.46%)	15 (17.67%)	3.395	0.065*
Mode of delivery				
Vaginal	71 (36.04%)	30 (35.29%)	0.140	0.708
Cesarean	126 (63.96%)	55 (64.71%)		
Neonatal birth weight (gm)	2982.5±208.8	3007±215.6		
Neonatal morbidity				
No morbidity	137 (69.54%)	71 (83.53%)	4.276	0.038*
Respiratory morbidities	27 (13.71%)	4 (4.71%)	4.037	0.044*
Congenital pneumonia	33 (16.75%)	10 (11.76%)	2.637	0.024*
Neonatal mortality	3 (1.52%)	1 (1.18%)	0.022	0.881
Puerperal fever	67 (34.01%)	22 (25.88%)	0.811	0.367

PROM, Premature rupture of membranes; *, significant p-value.

Discussion

Vaginitis during pregnancy is common finding due to the low immunity of pregnant women and the high glucose levels in blood that enhance bacterial growth and multiplications.¹³ In the current study we

found that 51.57% of patients had vaginitis. The incidence of bacterial vaginitis at Tanta University hospital was found to be 30.63% where the most common organism was found to be *Gardnerella vaginalis* (20.16%) as shown in Table 2. The greater incidence was in rural areas denoting poor hygiene and lack of good medical care. On the same side more infections were noted in low educated people 73.79%. The incidence was higher in non-occupied people (81.72%) as shown in Table 3.

Follow up of cases led to the detection that vaginitis patient had delivered earlier than patients in no vaginitis group (p-value=0.002*). The most common complications occurred were preterm labour and premature rupture of membranes (PROM) and puerperal fever. Neonatal morbidity and mortality were more in vaginitis group owing to the large number of patients and the more occurrence of preterm labour either spontaneously or complicating PROM cases as shown in Table 4.

Swadpanich et al.,¹⁴ conducted an intervention review to assess the effectiveness and complications of lower genital tract infection screening and treatment programs in reducing preterm birth and subsequent morbidity. They found that screening and treatment of genital infection programs in pregnant women reduced preterm birth and complications related to prematurity.¹⁴ Klein & Gibbs¹⁵ conducted a study to evaluate whether routine antepartum treatment of lower genital tract infection reduces the incidence of preterm birth in patients with bacterial vaginitis. They concluded that large trials stated that the routine administration of antibiotics is not beneficial if membranes are intact.

Conclusion

The incidence of vaginitis at Tanta University hospitals were found to be high as 51.57% and was found to be linked to preterm labour, PROM and maternal puerperal fever. Although No significant differences were found between vaginitis and no vaginitis groups in poor outcomes, we recommend treatment of cases with vaginitis to reduce poor outcomes during and after delivery.

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Conflicts of interest

No conflicts to declare.

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