Cervicovaginal Infections during Third Trimester of Pregnancy

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Abstract
Objective: This study was conducted in order to assess the prevalence of different cervicovaginal infections during pregnancy.

Materials and methods: Totally 110 healthy pregnant women with complaints of vaginal symptoms in their third trimester of pregnancy were checked for vaginal candidiasis, bacterial vaginosis, vaginal trichomoniasis, streptococcus β hemoliticus, gonorrhea, syphilis, and infection by chlamydia trachomatis and HIV.

Results: Among 110 studied women and mostly nullipara, the mean age was 25.2 years. All of them had at least one symptom including discharge, itching or burning of vagina. Among them 39(35.5%) had vaginal and endocervical infection identified by laboratory tests including candidiasis 26.4%, bacterial vaginosis 8% and streptococcus β hemoliticus 5.3 %. Gonorrhea and trichomoniasis were not seen. Three of the patients had positive IgG antibody for chlamydia trachomatis. None of them had serological positive test for syphilis and HIV.

Conclusion: Symptomatic pregnant women need to be actively searched for infections. Besides speculum examination as an easy to carry out clinical test and if needed laboratory exams must be used to choose the best treatment.

Keywords: pregnancy, cervicovaginal, infection

Introduction
In Pregnant women commonly increased vaginal discharge which in many instances is not pathological (1). Occasionally, an infection caused by a microorganism or misdistribution of bacterial population that compromise normal vaginal flora resulted to troublesome leukorrhea.

Cervicovaginal infections during pregnancy can threat the wellbeing of the mother and fetus (2). Early detection is important because maternal physiological alterations may hamper the diagnosis of infections and the management, on the other hand the presence of the fetus may limit treatment (3).

The possible side effects of cervicovaginal infections on the fetus have been the focus of several investigations for the past several years. Infections of the lower genital tract can have a direct effect on the fetus, while others predispose indirect fetal damage, secondary to premature labor and/or premature rupture of membrane.

The main causes of vaginal infections during pregnancy include bacterial vaginosis , thricomoniasis, candidiasis (4).

Bacterial vaginosis is a clinical syndrome resulting from a change in the normal vaginal flora. The normal lactobacilli dominant vaginal flora is replaced by an overgrowth of endogenous organisms (5).The etiology of BV is complex and the commonly associated
organisms include Gardnerella vaginalis, Mycoplasma hominis, Mobiluncus species and anaerobic Gram negative rods and positive cocci (6).

Accumulating evidences that BV causes pregnancy complications such as preterm labor (PTL) (7,8), premature rupture of membrane (PROM), chorioamnionitis and postpartum endometritis has been shown in several studies from developed countries (5).

Foamy leucorrhea with purities and irritation can be caused by trichomonas vaginalis (9).

Some evidences showed that trichomonas vaginalis were at increased risk of having preterm labor (PTL), low birth weight infant and premature rupture of membrane (PROM) (10-13).

Candida albicans may sometimes cause an extremely profuse, irritating discharge, and because of increasing of estrogen and deposition of glycogen and other substrates in the vagina the number of stricken women during pregnancy increased (9). In some women such as pregnant women it is likely to be recurrent (14).

Like sequelae in the mother, maternal HIV infection has an independent influence on birth outcome, especially where there is also chorioamnionitis (15, 16), HIV has a relation with both LBW and stillbirth (17) and with spontaneous abortion (18). It has been observed that there is an increased risk of preterm delivery in HIV positive mothers compared to HIV negative mothers (19, 20).

Literature search has revealed limited reports on cervicovaginal and concurrent lower genital tract infections during pregnancy in our country. The aim of this study was to assess prevalence of different cervicovaginal infections in our population to have a base for planning another study about the relation of these infections and pregnancy complications such as preterm labor (PTL) and premature rupture of membrane (PROM).

Materials and methods

Cases were recruited from pregnant women with complaints of vaginal symptoms (discharge, burning and itching) in their third trimester of pregnancy presented for their prenatal visit at the hospitals of Shahed University.

Institutional ethical permission was obtained and all women gave informed consents.

Clinical data regarding age, parity, last menstrual period, previous illnesses, and history of taking antibiotics in at least last three months, past obstetric history were recorded for each woman.

Women were excluded of study if they were known to take antibiotics during pregnancy or known as overt diabetes or gestational diabetes or any kind of devastating disease. Patient was asked to submit a midstream specimen of urine; all had urine culture for detection of bacteriuria. The women with positive urine culture were excluded from further analysis.

After a general and obstetrical examination, a sterile unlubricated Casco’s speculum was gently inserted, discharge were collected and processed as follows: Whiff test, wet mount for light microscopy, and Gram stain. Venous blood samples were collected from each subject for tests for syphilis and human immunodeficiency virus (HIV) and Chlamydia trachomatis. VDRL was used to screen for syphilis. All reactive sera were subjected to confirmatory test, the Fluorescent Treponema Antibody Absorbent (FTA-Abs) tests. The plan was testing VDRL for all women and the Fluorescent Treponema Antibody Absorbent (FTA-Abs) for positive VDRL cases.

HIV antibody testing was performed using a recombinant HIV-1/HIV-2 Elisa kit (©Abbott Diagnostics, USA) and sera confirmed by Western Blot (©Diagnostic Biotechnology, India).

The results of these exams were used to determine the definitive diagnosis of the following infections: vaginal candidiasis, bacterial vaginosis, vaginal trichomoniasis, Streptococcus β hemoliticus, Gonorrhea, syphilis, and infection by Chlamydia trachomatis and HIV. Post test counseling and suitable treatment were given to all those who had positive test. All women continued their routine antenatal care.

Descriptive statistics were used and all results were presented as frequencies, percentages, means and ranges.

Results

A total of 110 women were recruited over one year period. The mean age of the women were 25.2(range 19-39), and their parity was 0-5 with the median of null. Only 1.8% were illiterate, 15.5% low literate and 82.7% had qualified education. The gestational age at the time of sampling was between 28 to 40 weeks (mean 35w).All of the women and their consorts had only one lifetime sexual partner. Although social habits such as alcohol and smoking were considered in the study with a view to identifying women at risk for infections, there was no one to comment. Nobody had the history of acute
PID before pregnancy, while 21.8% had previous treatment of vaginitis or cervicitis and 6.4% had lower urinary tract infection treatment. Most of them had vaginal discharge (92.7%), itching was seen in 24.5% and burning in 22.7%. Twenty percent had all of the symptoms together. Dysoria was the complaint of 8.2 percent.

The nature of discharge was mucoid (37.3%), cheesy (27.3%), watery (20%) and foamy (15.5%). Most of them were white (74.5%), 16.4% had yellow color and 9.1% were green. Ectropion and erosion were seen in near all. Of the 110 recruited women, 39 (35.5%) had vaginal and endocervical infection identified by laboratory tests. Candidiasis was the most common infection, being diagnosed in 26.4%, bacterial vaginosis was detected in 8% and streptococcus β hemoliticus was seen in 5.3%. Three women (2.7%) had mixed candidiasis and bacterial vaginosis.

None of the patients had positive test for Gonorrhea and Trichomonase. Three of the patients had positive IgG antibody for Chlamydia trachomatis and all of them had negative IgM. No one had serological positive test for syphilis and HIV.

Most of the white mucoid discharge had negative bacteriology, in the other hand foamy green discharges had more positive test.

**Discussion**

In this study approximately 35.5% of the pregnant women had at least one type of cervicovaginal infection during their last trimester. The prevalence in different studies around the world has shown a wide range (8, 9). This figure is among the lowest so far. However, it needs to be considered that only the symptomatic women have been checked in this study.

The reasons for this could be many including criteria employed for diagnosis, the quality checks used, intrinsic differences in the population studied including age, prevalence of risk factors and the numbers studied.

Benedetto reported 44.3% positive cervicovaginal culture in pregnant women. The microorganisms most frequently found were: yeast 44%, ureaplasma urealiiticum 29%, group B streptococcus 15%, and bacterial vaginosis 11% (21).

Vaginal candidiasis was the most prevalent infection in the most studies (4). This result agrees with the literature, where it is described as the most frequent genital infection during pregnancy, especially during the third trimester (3, 22-24). Besides, specialists in vaginal flora are convinced that many women are asymptomatic carriers, while the simple presence of the yeast does not necessarily mean clinical infection (24).

Studies performed in developed countries leave no doubt that BV plays an important role in pregnancy complications (25-27). Mead in his review of studies for developed countries, proposed an approximation on the prevalence of BV in pregnant women to be between 10-30% with up to 75% percent being asymptomatic (28). In another study the prevalence of BV in asymptomatic pregnant women has been reported 52% which illustrates that BV and concurrent lower genital infections are common in developing countries (29). Some of the possible important reasons for the high incidence include the lower socioeconomic status of their predominately black African underprivileged women, where sexual promiscuity may be common practice. With regards to sexual behavior, BV and associated infections were more common in women with multiple sexual partners (30-35), history of previous pelvic inflammatory disease (PID) and urinary tract infections (UTI).

In our study group bacterial vaginosis were less common, it can be because all of the women and their consorts had only one lifetime sexual partner, this stable relationship has an important role in protecting them against infections, besides there are some cultural beliefs that limits sexual activities during pregnancy.

On the other hand, vaginal trichomoniasis which was largely overdiagnosed by clinical impression was confirmed by the laboratory in non of the samples. The low prevalence found in this study is shared by other studies (23) and agrees with the significant decrease in the prevalence of VT observed in the last years (36). One of the explanations for the low presence of VT is the lifestyle of participants and maybe the widespread use of imidazolic derivatives for the treatment of any frothy vaginal discharge.

The possibility that pregnancy per se increases the risk of infection by C. trachomatis has been suggested by various authors, particularly in studies carried out with pregnant adolescents who have higher rates of infection than nonpregnant teenagers (3). Although this study included young women (16% were adolescents), the prevalence of CT was very low (2.1%). In another study carried out by our group in the same hospital, but among infertile women who
had laparoscopy because of tubal factor the prevalence of CT was 6.7%, suggesting that in our population, the risk of this infection is very low (37).

There was not any positive HIV test in this group, despite global increasing number of infected women, our country is among the lowest so far. The religious believes and lifestyle of our population protect them against various kind of sexually transmitted disease.

Besides the identification of these four groups of infectious agents, a fifth group of pregnant women who presented intermediate vaginal flora suggesting some pathologic process were diagnosed, based on the criteria of Hillier et al (38). The main finding was a significant decrease of lactobacillus in the microscopic examination of the vaginal discharge, where bacterial vaginosis would be imminent. The prevalence of this intermediate vaginal flora was relatively high among the pregnant women studied (6.7%).

It is recommended that pregnant women with intermediate vaginal flora be carefully followed during prenatal care, due to the higher risk of developing bacterial vaginosis and the higher risk of its potential consequences. Repeated microscopic examinations of the vaginal discharge should be performed whenever the patient relates any symptoms.

Our results highlight the need to search actively for cervicovaginal infections during pregnancy, not limited to a single speculum examination. Low-cost and easy-to-carry-out clinical tests and laboratory exams can be used as routine in prenatal care, due to the relatively high prevalence of some infections and the association of some of them with perinatal complications

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**References**

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