A Clinico-Etiological Assessment of Vaginal Infections in Pregnant Women: An Observational Study

Jyoti[1], Kalpana Jha[2]

[1]Senior Resident, Department of Obstetrics and Gynaecology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India
[2]Senior Resident, Department of Obstetrics and Gynaecology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

Abstract

Aim: The present study was conducted to record the causes of vaginal infection in females.

Methods: The present study was conducted in the Department of Obstetrics and Gynaecology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India and It included 250 pregnant women with suspicion of symptomatic and asymptomatic vaginal infections.

Results: In the present study, 200 (80%) out of 250 patients were found to be positive for vaginal infections. The study shows that age group 17- 25 years had 12% of cases, 26- 34 years had 63%, 35- 42 years had 18% and >42 years had 7% of cases. The difference was significant (P<0.05). The study shows that common microorganisms was Chlamydia trachomatis (35%), Candida albicans (28%), Mycoplasma hominis (13%), Gardnerella vaginalis (10%), Staphylococcus aureus (6%), Trichomonas vaginalis (4%), Neisseria gonorrhea (2%), E. coli (1%) and vibrio Mobiluncus (2%).

Conclusion: Vaginal infections are quite common in pregnant women. The most common are Chlamydia trachomatis, Candida albicans, Mycoplasma hominis, Gardnerella vaginalis. Routine vaginal and cervical swab sample cultures should be performed on all pregnant women to avoid developing infections.

Keywords: Vaginal infections, Candida albicans, Chlamydia trachomatis, Microorganisms

Introduction

Vaginitis in the child-bearing age group has been well-recognized as a major public health concern due to its high recurrence. Pregnant women are particularly the group at risk owing to the high infection rates stemming from immunological, hormonal changes, and from greater vaginal glycogen stores. [1] Several obstetric complications such as pre-term labor, amniotic fluid infection, premature rupture of the fetal membranes, and low birth weight of the neonate [2] can be attributed to microbial infections of pregnancy, leading to high perinatal mortality. [3] However, proper identification and treatment will reduce the risk of preterm birth and its consequences. [4] In a developing nation like India, where very

less amount of GDP is spent on healthcare facilities, the burden of diseases such as preterm delivery, low birth weight, PROM imposes might be reduced by early identification of risk factors associated and treating them pre-handed. Although etiology of such complications is highly varied, vaginal infection is one facet of the prevention cube that cannot be overlooked.

The vagina is a sensitive and complicated micro ecosystem, consisting of anatomic structures, microorganisms, local immunity, and endocrine regulation functions. [5] The bacterial colonization of the vagina is usually a mixed population, with anaerobes the dominant bacteria. Vaginal microbiomes are mutually antagonistic and interdependent, keeping a dynamic balance, regulated by the endocrine system and local immune system, and affected by the internal environment of the vagina. Estrogen level, Lactobacillus species (spp.), local immunity, and vaginal pH value play important roles in maintaining the micro ecological balance of the vagina. [6] Pregnancy is known to be a time when the vagina is prone to various vaginal infections. Changes in physiological hormones affect the vaginal micro ecological environment, composition and proportion of microorganism in the vaginal micro ecosystem, and the pH value of the vagina. In addition, immunosuppression that occurs during pregnancy reduces body immunity so that opportunistic infections, such as vulvovaginal candidiasis (VVC) and Trichomonas vaginitis (TV) infection, increase, thus contributing to the vaginal micro ecosystem's fragile balance. [7]

Microbial infections of the vagina among pregnant women are serious problems. Vaginitis is inflammation of the vagina. Vulvovaginitis, is an inflammation of the vagina and vulva. Infection can result in discharge, itching and pain. The three main causes of vaginitis are infections by bacteria (bacterial vaginosis), yeast (vaginal candidiasis), or the protozoan that causes trichomoniasis. A woman may have multiple infections at any one time. If there is discomfort in the vulvovaginal area, women can request their health care providers evaluate for the presence of an infection. [8] They can lead to serious medical complications such as preterm labor, amniotic fluid infection, premature rupture of the fetal membranes, and low birth weight of the neonate, leading to high prenatal mortality. The vagina could be infected by a variety of pathogens including bacteria, fungi, viruses, and parasites. Bacterial vaginosis (BV) is the most frequent vaginal infection, characterized by the replacement of Lactobacillus species of normal vaginal flora by the excessive growth of a mixture of microorganisms including Gardnerella vaginalis, Bacteroides species, genital mycoplasma, and fastidious anaerobic bacteria. [9]

A woman may have vaginal itching or burning and may notice a discharge. The discharge may be excessive in amounts or abnormal in color. Symptoms may be such as presence of infection, irritation or itching of the genital area inflammation of the labia majora, labia minora, or perineal area, vaginal discharge, foul vaginal odor, pain/irritation with sexual intercourse. Vaginal conditions could be diagnosed using known Amsel's clinical criteria including vaginal discharge appearance, pH measurement, whiff test, and clue cell on microscopy; however, these requirements alone cannot identify the cause of vaginal illness. [10] The present study was conducted to record the causes of vaginal infection in females.

Materials and Methods

The present study was conducted in the Department of Obstetrics and Gynaecology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India for one year

Methodology

Total 250 pregnant women with suspicion of symptomatic and asymptomatic vaginal infections were included. All were informed regarding the study and written consent was obtained. Ethical clearance was taken before starting the study.

General information such as name, age, previous history of abortions, last menstrual period, and clinical signs and symptoms were recorded. Vaginal and cervical swabs samples were obtained from each subject using the standard sampling technique and were submitted to the microbiology laboratory, they were processed immediately for possible isolation and identification of pathogenic microorganisms in accordance with standard laboratory methods.

Statistical analysis

Results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

Results

Table 1: Age wise distribution

Age in years	N	%
17-25 years	24	12%
26-34 years	126	63%
35-42 years	36	18%
>42 years	14	7%
Total	200	100

In the present study, 200 (80%) out of 250 patients were found to be positive for vaginal infections. The study shows that age group 17- 25 years had 12% of cases, 26- 34 years had 63%, 35- 42 years had 18% and >42 years had 7% of cases. The difference was significant (P<0.05).

Table 2: Type of microorganisms

Microorganisms	N	%
Chlamydia trachomatis	70	35
Candida albicans	56	28
Mycoplasma hominis	26	13
Gardnerella vaginalis	20	10
Staphylococcus aureus	10	5
Trichomonas vaginalis	8	4
Neisseria gonorrhea	4	2
E. coli	2	1
Vibrio Mobiluncus	4	2

The study shows that common microorganisms was Chlamydia trachomatis (35%), Candida albicans (28%), Mycoplasma hominis (13%), Gardnerella vaginalis (10%), Staphylococcus aureus (6%), Trichomonas vaginalis (4%), Neisseria gonorrhea (2%), E. coli (1%) and vibrio Mobiluncus (2%).

Discussion

Few studies have investigated the characteristics of the vaginal micro ecosystem and genital tract infection (GTI) in pregnant women. Some clinical studies have shown that for pregnant women, it is common for their vagina to have normal Ph values (3.8 to 4.5) and Lactobacillus spps., but the exact proportion of Lactobacillus spp. and the vaginal micro ecosystem factors of importance to pregnant women is still unclear. [11] Various kinds of vaginitis may result in abortion, intrauterine infection, fetal growth retardation, premature rupture of

membranes, preterm labor, low birth weight, puerperal infection, and other adverse pregnancy outcomes. Severe illness and rapidly progressing illness can even lead to cervical cancer and other diseases, which may result in an adverse impact on both maternity and fetal health. [12,13]

Vaginal complaints such as BV, candidiasis, trichomoniasis, and Chlamydia trachomatis infections are common among women of reproductive age, with high incidences during pregnancy. Pregnant women have a twofold increase in the prevalence of vaginal microorganisms colonization compared to non-pregnant women. Increased levels of circulating estrogens and deposition of glycogen and other substrates in the vagina during pregnancy influence this association. Such large ratios of pregnant women with positive culture or vaginosis might necessitate medical treatments and indicate the high prevalence and variations in the causal agents associated with vaginal infections. [14]

In this study, out of 250 patients, 200 found to be positive for vaginal infections. Age group 17- 25 years had 12% of cases, 26- 34 years had 63%, 35- 42 years had 18% and >42 years had 7% of cases. This is similar to Einarson. [15] We found that common microorganisms was Chlamydia trachomatis (35%), Candida albicans (28%), Mycoplasma hominis (13%), Gardnerella vaginalis (10%), staphylococcus aureus (5%), Trichomonas vaginalis (4%), Neisseria gonorrhea (2%), E. coli (1%) and vibrio Mobiluncus (2%). This is in agreement with Tolosa et al. [16]

Vaginitis is the disruption of the healthy vaginal microbiota. The vaginal microbiota consists of those organisms which generally do not cause symptoms, infections, and results in good pregnancy outcomes, and is dominated mainly by Lactobacillus species. The disruption of the normal microbiota can cause a vaginal

yeast infection. Vaginal yeast infection can affect women of all ages and is very common. The yeast Candida albicans is the most common cause of vaginitis. Infectious vaginitis accounts for 90% of all cases in reproductive age women. [17]

Other infections are candidiasis caused by proliferation of Candida albicans, Candida tropicalis, Candida krusei, bacterial vaginosis caused by increased growth of Gardnerella, aerobic vaginitis. Other fewer common infections are caused by gonorrhea, chlamydia, Mycoplasma, herpes, Campylobacter, improper hygiene, and some parasites, notably Trichomonas vaginalis. Women who have diabetes develop infectious vaginitis more often than women who do not. [18] Genital mycoplasma, including M. hominis and M, Urea plasma spp., are suspected to contribute to a number of pathological conditions such as preterm birth, premature birth, low birth weight, and perinatal morbidity and mortality [26]. In this study, the higher frequency of infection among Mycoplasma species isolates was due to M. hominis (13.8%) than to U. urealyticum (6.9%) infection. M. hominis accounted for 35% of the vaginosis cases in Nigerian women and it was regarded as the most common isolate. [19,20]

Conclusion

Vaginal infections are quite common in pregnant women. The most common are Chlamydia trachomatis, Candida albicans, Mycoplasma hominis, Gardnerella vaginalis. Routine vaginal and cervical swab sample cultures should be performed on all pregnant women to avoid developing infections.

References

1. Hoffman BL. Williams obstetrics, study guide. McGraw Hill Professional; 2018 Dec 28.
2. Giraldo PC, Araújo ED, Junior JE, Amaral RL, Passos MR, Gonçalves AK. The prevalence of urogenital

infections in pregnant women experiencing preterm and full-term labor. Infectious diseases in obstetrics and gynecology. 2012 Oct;2012.

3. Dover SE, Aroutcheva AA, Faro S, et al. Natural antimicrobials and their role in vaginal health: a short review. Int J Probiotics Prebiotics 2008;3(4):219–230.

4. Brocklehurst P, Gordon A, Heatley E, Milan SJ. Antibiotics for treating bacterial vaginosis in pregnancy. Cochrane Database of Systematic Reviews. 2013(1).

5. Liao QP: Female vaginal micro ecosystem and vaginal microecological evaluation. J Pract Obstet Gynecol, 2010; 26(2): 81–83.

6. Xie LX, Jia HJ, Hu LN et al: A study on the distribution of vaginal microflora in 800 women and its influencing factors. Progr Obstet Gynecol, 2008; 17(2): 81–86.

7. Fan L,Wu JC, Ren ML: Analysis of vaginal micro ecological status of pregnant women. Jiangsu Med J, 2011; 37(2): 205–7.

8. Cohen CR, Duerr A, Pruithithada N, Rugpao S, Hillier S, Garcia P, Nelson K. Bacterial vaginosis and HIV seroprevalence among female commercial sex workers in Chiang Mai, Thailand. AIDS (London, England). 1995 Sep 1;9(9):1093-7.

9. Sewankambo N, Gray RH, Wawer MJ, Paxton L, McNaim D, Wabwire-Mangen F et al. HIV-1 infection associated with abnormal vaginal flora morphology and bacterial vaginosis. Lancet, 1997; 350:546-550.

10. Leitich H, Bodner-Adler B, Brunbauer M, Kaider A, Egarter C, Husslein P. Bacterial vaginosis as a risk factor for preterm delivery: a meta-analysis. American journal of obstetrics and gynecology. 2003 Jul 1;189(1):139-47.

11. Hitti J, Hillier SL, Agnew KJ et al: Vaginal indicators of amniotic fluid infection in preterm labor. Obstet Gynecol, 2001; 97(2): 21l–19.

12. Deng FW: Analysis of the distribution of pathogenic bacteria and drug resistance in urinary tract infection. Chin J Nosocomiol, 2012; 22(17): 3890–92.

13. Hackenhaar AA, Albernaz EP: Prevalence and associated factors with hospitalization for treatment of urinary tract infection during pregnancy. Rev Bras Uinecol Obstet, 2013; 3(5): 199–204.

14. Leitich H, Kiss H. Asymptomatic bacterial vaginosis and intermediate flora as risk factors for adverse pregnancy outcome. Best practice & research Clinical obstetrics & gynaecology. 2007 Jun 1;21(3):375-90.

15. Einarson A, Koren G. Bacterial vaginosis during pregnancy. Should we screen for and treat it? Canadian family physician. 2002 May 1;48(5):877-8.

16. Tolosa JE, Chaithongwongwatthana S, Daly S, Maw WW, Gaitán H, Lumbiganon P, Festin M, Chipato T, Sauvarin J, Goldenberg RL, Andrews WW. The International Infections in Pregnancy (IIP) study: variations in the prevalence of bacterial vaginosis and distribution of morphotypes in vaginal smears among pregnant women. American journal of obstetrics and gynecology. 2006 Nov 1;195(5):1198-204.

17. Kataoka S, Yamada T, Chou K, Nishida R, Morikawa M, Minami M, Yamada H, Sakuragi N, Minakami H. Association between preterm birth and vaginal colonization by mycoplasmas in early pregnancy. Journal of clinical microbiology. 2006 Jan;44(1):51-5.

18. Anukam K, Reid G. Organisms associated with bacterial vaginosis in Nigerian women as determined by PCR-DGGE and 16S rRNA gene sequence. African Health Sciences. 2007 Nov 9;7(2).

19. Zdrodowska-Stefanow B, Kłosowska WM, Ostaszewska-Puchalska I, Bułhak-Kozioł V, Kotowicz B.

Ureaplasma urealyticum and Mycoplasma hominis infection in women with urogenital diseases. Adv Med Sci. 2006 Jan 1;51(1):250-3.

20. Cordero, J. F. B., Moretta, D. E. S., Medina, L. S. H., Camacho, A. F. B., Suárez, M. M. G., Robles, A. C. W., Acendra, A. H. Y., Trespalacios, C. A. R., & Florez, J. A. B. Tau Protein: Target of Coenzyme Q10 as a Protective Effect Against Alzheimer's. Journal of Medical Research and Health Sciences. 2022; 5(4): 1933–1940.