

Prevalence of vaginitis among pregnant women attending Paropakar Maternity and Women's Hospital, Thapathali, Kathmandu, Nepal

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ABSTRACT

Vaginitis is the most prevalent disorder among the pregnant women. The objective of this study was to find out the prevalence of common types of vaginitis among the pregnant women visiting Paropakar Maternity and Women's Hospital in Kathmandu. Among 200 pregnant women included in the study, 78 (39.0%) had vaginitis. Of total 78 positive cases of vaginitis, 29.5% had candidiasis, 52.6% bacterial vaginosis and 1.3% trichomoniasis. Approximately 83% had monomicrobial infection and 16.7% had polymicrobial infection. Vaginitis was common in the age group of 20 to 29 years (41.8%) and 30-39 years (40.0%). Ethnically, *Indo-Aryans* (40.2%) were mostly infected. The infection rate was the highest among illiterate women (47.6%) and least among the women having education above secondary (23.0%). The positive infection rate was higher in women from rural area (45.2%) than those from urban area (37.3%). Nearly half of the women with agriculture occupation (48.4%) had vaginitis. Vaginitis was common in women with third pregnancy (52.6%). Among 78 vaginitis cases, 53 (67.9%) were asymptomatic cases.

Keywords: Vaginitis, pregnant women, hospital, Kathmandu.

INTRODUCTION

Vaginal symptoms are one of the most common reasons for gynecological consultation.¹ In Nepal one in three women needs gynecological consultation for abnormal vaginal discharge.² Abnormal vaginal discharge (changes in quantity, color and odor), may indicate vaginitis. Vaginitis literally refers to a non-specific inflammation of vagina^{3,4} characterized by a watery discharge with burning and itching of the vulva.⁴ The three most common causes of vaginitis are bacteria (bacterial vaginosis), followed by fungi (candidiasis) and parasites (trichomoniasis).⁵ This results due to the change in normal balance of vaginal flora. Many things like douching, feminine hygiene, sprays, certain soaps or bubble baths, antibiotics, diabetes, pregnancy or infections can disturb the balance of a healthy vagina.⁶

Vaginitis causes different types of morbidity in women especially of reproductive age group particularly during pregnancy resulting in sterility, abortion, and stillbirth.^{7,8} Since the disease leads to many complications, it is of the prime importance to know the causative organisms, prevalence of the disease and its attributing factors affecting the prevalence among Nepalese women. So, this cross sectional descriptive study was done to determine the prevalence of vaginitis (bacterial, fungal and parasitic) among the pregnant women visiting Paropakar Maternity and Women's Hospital in Kathmandu Nepal.

MATERIALS AND METHODS

Two hundred high vaginal swabs were collected from the pregnant women visiting Paropakar Maternity and Women's Hospital for the period of 4 months (27 May to 27 September, 2006). Verbal consent was taken from each of participants. A self-designed questionnaire regarding their general health history, number of pregnancy, educational level, age, ethnic group etc was filled. Two high vaginal swabs taken from each pregnant woman were taken by the health professional, inoculated in the normal saline and were transported at ambient conditions to the microbiology laboratory of the hospital.

Amine test (vaginal Whiff test), wet mount test, gram's stain and culture on Sabouraud Dextrose Agar (SDA) were performed. One of the swabs was subjected to wet mount, Whiff test and gram's stain and the other was inoculated on SDA. Wet mount was performed for the presence of motility, oval flagellated protozoa, clue cells and white blood cells. For the Whiff test few drops of a potassium hydroxide (KOH) solution were added to a sample and a strong fishy odor indicated positive bacterial vaginosis. Gram's stained smear was looked for clue cells.

The sufficient growth when obtained on SDA, a standard germ tube test was performed by inoculating 0.5ml of serum with a loopful of the test strain incubating at 37 C for 3 hours and observed for the tube like appendages indicating germ tube test positive for *C. albicans*.

Table-1: Different types of vaginitis among pregnant women

Types of vaginitis	Frequency (%)
Bacterial vaginosis	43 (52.6)
Vaginal candidiasis	21 (29.5)
Trichomoniasis	1 (1.3)
Vaginal candidiasis + Bacterial vaginosis	12 (15.4)
Vaginal candidiasis + Bacterial vaginosis + Trichomoniasis	1 (1.3)
Total	78 (100)

Statistical analysis was performed by calculating chi-square value and using Microsoft excel.

RESULTS

Out of total two hundred patients attending the maternity hospital during the study period, seventy eight cases (39.0%) showed vaginitis. The different types of vaginitis were as shown in Table-1. Prevalence of vaginitis was common in age group 20 to 29 years and 30-39 years (Fig. 1) ($P < 0.05$). The pregnant women having education above secondary were least infected (Fig. 2) ($P < 0.05$). Among total pregnant women, prevalence was common in women having agriculture based occupation (48.4%) (Table-2) and in pregnant women with 3rd pregnancy (52.6%). The prevalence of vaginitis was found higher in *Indo-Aryans* as compared to *Tibeto-Burmans* ($P > 0.05$). Pregnant women of rural settlement area were found to be highly infected (45.2%) than from urban area (37.3%) ($P > 0.05$).

DISCUSSION

The present study found two-fifth of pregnant women with infectious vaginitis (39.0%), which was in agreement with Sami and Baloch⁹ in Quetta (33.5%), Gibney *et al*¹⁰ in Bangladesh (37.2%) and Singh *et al*¹¹ in India (33.5%) but the lower prevalence was obtained in the study conducted by Rivera *et al*¹² in Spain (26.0%) and Georgijevic *et al*¹³ in Belgrade (25.0%).

Among total 78 positive cases in this study BV was the common (52.6%) followed by candidiasis (29.5%) and trichomoniasis (1.3%). Polymicrobial infection existed in 16.7% of cases. The trend of etiological agent causing vaginitis was similar to the study conducted in Banladesh, Denmark, Jamaica, Peru and Iran.^{10,15-18} The prevalence rate of vaginitis among people of different communities vary widely which might be due to certain factors such as hygiene behaviors and sociodemographic characteristics. In the

rural area of China, the prevalence of BV, trichomoniasis and candidiasis were 6.6%, 2.9% and 3.9% respectively.¹⁹ In Vientiane, the prevalence were 24.5%, 3.7% and 39.5%.²⁰ In the rural area of Northeast Brazil, 20% of women had BV, 4.1% trichomoniasis and 12.5% candidiasis.²¹ Therefore, it is important to try to establish a correlation between vaginitis and factors affecting its prevalence.

Previously, BV was called non specific vaginitis.³ BV is currently the most prevalent cause of infectious vaginitis among women seeking medical service for genitourinary disease.¹⁷ Research suggests that BV is actually not an infection but a condition resulting from an imbalance in the vaginal flora.² BV accounts for 10-30% of cases of infectious vaginitis in women of childbearing age.¹ All pregnant women who have ever had a premature delivery or low birth weight baby should be considered for a BV examination, regardless of symptoms.

After BV, candidiasis was found to be the causative agent of vaginitis. During pregnancy, the vagina shows increased susceptibility to infection by *Candida* spp, resulting in both a higher prevalence of vaginal colonization and a higher rate of symptomatic vaginitis.²³ High levels of reproductive hormones provide an excellent carbon source for *Candida* spp, i.e. by providing high glycogen content in the vaginal tissue. Several investigators demonstrated in vitro binding of female sex hormones to *Candida* spp as well as the capacity of certain hormones to enhance yeast mycelia formation and hence virulence.²⁴ The prevalence of candidiasis in this study was nearly similar to study conducted by Kamara *et al*¹⁶ in Turkey and Sihavong *et al*²⁴ in Vientiane.

Present study showed the prevalence of vaginitis was common in the age group 20-29 and 30-39. This may be

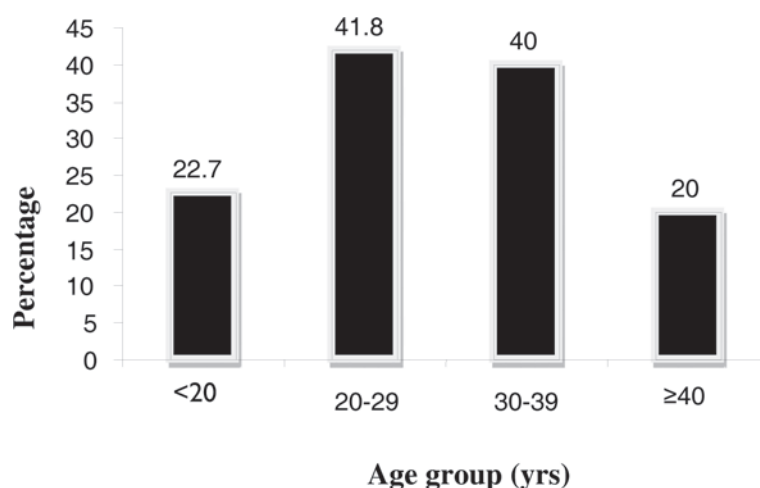


Fig. 1: Prevalence of vaginitis among different age groups

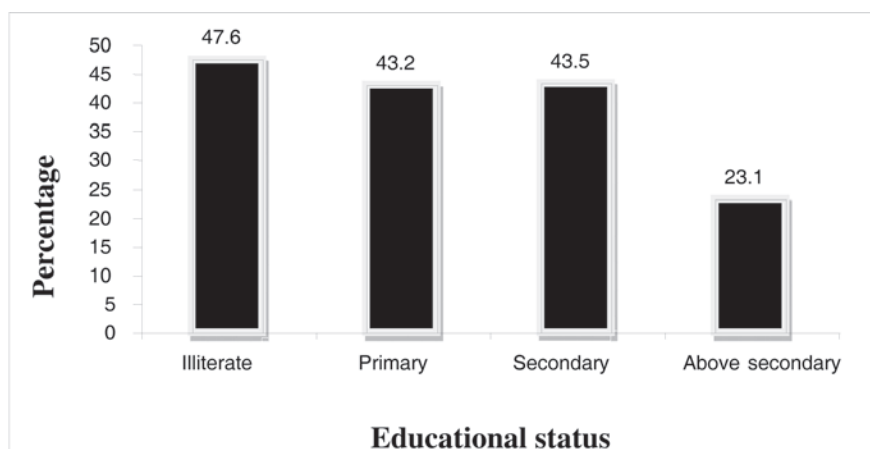


Fig. 2: Prevalence of vaginitis among pregnant women with different educational status

due to the age being the most reproductively active age group and the chances of high sexual exposure at this age. Similarly Manandhar *et al*²⁶ had conducted study among the Brahmin and dalit of reproductive age group and observed the high prevalence on the age group 25-29 followed by 20-24.

The pregnant women who had education above secondary were least infected with vaginitis but illiterate women were highly infected which was statistically significant ($P < 0.05$). The low economic status, lack of education, lack of a female consultant at the health service centre, hesitance to approach medical service, social cultural structure might be regarded as the cause of higher prevalence of vaginitis among less educated women.

The study also revealed higher rate of vaginitis among the pregnant women of *Indo-Aryan* ethnicity as compared to *Tibeto-Burman* ($P > 0.05$). This indicated that ethnic aggregation and predisposition to the vaginal infection is not genetically determined but may be strongly determined by the behavioural factors, socioeconomic condition, health awareness etc. Kevis and Mark also concluded that there was no significant difference in vaginal pH level between black and white women after controlling for differences in confounding factors, particularly vaginal flora.²⁵

In this study the rate of vaginitis was more in the pregnant women of rural area, which is similar to the finding of

Table-2: Prevalence of vaginitis among pregnant women having different occupation

Occupation	Total (N)	Positive (n)	%
Agriculture	43	21	48.4
Housewife	132	46	34.8
Other than agriculture	25	11	44.0

the study conducted by Manandhar *et al*²⁶ in 2005. Concerning to the occupation, the higher infection rate was found among the pregnant women having agriculture as occupation. The poor sanitation practices, lack of time to keep their proper health, poor living standard, ignorance and difficulty in accessibility towards immediate health care facilities may attribute to the higher rate of vaginitis among farmers from rural region.

The rate of infection was in the order 3rd>2nd>1st pregnancy. This might be

due to the vaginal stasis increases with number of pregnancy and sexual exposure or the physical health of the women becomes weaker leading to the physical disabilities, reduced immunity power and decreases their hygiene and sanitation interest. Bahram *et al* also found a significant correlation between BV and number of pregnancy.

The study shows that among the positive cases the majority were asymptomatic patients, similar to the finding of Nelson and Macones²⁷ in contrary with the finding by Manandhar *et al*²⁶ among BV positive patient. This shows the symptoms to be independent of the vaginitis and infer the strong recommendation to all pregnant women who have ever had a premature delivery or a low birth weight baby for a BV examination regardless of symptoms. If these cases go undetected, it may result abnormalities in childbirth and maternal health. Hence emphasis should be made to conduct strict routine maternal health check up among all the pregnant women.

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REFERENCE

- Owen MK, Clenney TL. American family physician: Vaginitis. *J Amer Acad Family Physician* 2004; 70: 2125-32.
- Pradhan P. Vulvovaginal candidiasis. *Nepal Med Coll J* 2001; 3: 122-6.
- Gillespie SH. Medical Microbiology Illustrated: Investigation of specimens from the genital tract and diagnosis of STDs (1st edition). Butterworth-heinmann Ltd 1994; 230-3.
- Blackwell's Nursing dictionary (2nd edition). Blackwell publishing Ltd 2005; 642.

5. Forbes BA, Sahm DF, Weissfeld AS. Bailey and Scott's diagnostic Microbiology (12th edition). *Mosbyelsevier* 2007; 860-6.
6. <http://familydoctor.org/194.xml>
7. Hay PE, Lamont RF, Taylor-Robinson D, Morgan DJ, Ison C, Pearson. Abnormal bacterial colonization of the genital tract and subsequent preterm delivery and late miscarriage. *Brit Med J* 1994; 308: 295.
8. Mania-Pramanik J, Kerkar SC, Salvi VS. bacterial vaginosis: a case of infertility. *Int'l J STD/AIDS* 2009; 20: 778-81.
9. Sami S, Baloch SN. Vaginitis and sexually transmitted infections in a hospital based study. *J Pakistan Med Assoc* 2005; 55: 242-4.
10. Gibney L, Macaluso M, Kirk K *et al*. Prevalence of infectious disease in Bangladeshi women living adjacent to truck stand; HIV/ STD/ hepatitis/ genital tract infections. *Sex Transm Infect* 2001; 77: 344-50.
11. Singh V, Sehgal A, Satyanarayana L, Gupta MM, Parashari A, Chattopadhyaya D. Clinical presentation of gynecologic infections among Indian women. *Obstet Gynecol* 1995; 85: 215-9.
12. Rivera LR, Trenado MQ, Valdez AC, Gonzaleg CJ. Prevalence of bacterial vaginitis and vaginosis; association with clinical and laboratory features and treatment. *Gynecol Obstet Mex* 1996; 64: 26-35.
13. Georgijevic A, Cjukic-Ivancevic S, Bujko M. Bacterial vaginosis: Epidemiology and risk factors. *Srp Arh Celok Lek* 2000; 128: 29-35.
14. Bang RA, Bang AT, Baitule M, Choudhary Y, Sarmu SK, Tale O. High prevalence of gynaecological diseases in rural Indian women. *Lancet* 1989; 1: 85-8.
15. Bro F. Vaginal microbial flora in women with and without vaginal discharge registered in general practice. *Dan Med Bull* 1989; 36: 481-5.
16. Kamara P, Hylton-Kong T, Brathwaite A *et al*. Vaginal infections in pregnant women in Jamaica: Prevalence and risk factors. *Int'l J STDs/AIDS* 2000; 11: 516-20.
17. Patricia JG, Cesar PC, Marina C, Holmes KK. Sexually transmitted and reproductive tract infections in symptomatic clients of pharmacies in Lima, Peru. *Bull WHO* 2006; 82: 483-90.
18. Gonzalez-Pedraza AA, Ortiz Zaragoza MC, Irigoyen CA. Bacterial vaginosis "broad overview". *Rev Latinoam Microbiol* 1999; 41: 25-34.
19. Fang X, Zhou Y, Yang Y, Diao Y, Li H. Prevalence and risk factors of trichomoniasis, bacterial vaginosis, and candidiasis for married women of child-bearing age in rural Shandong. *Japan J Infect Dis* 2007; 60: 257-61.
20. Sihavong A, Phouthavane T, Lundborg C, Sayabounthavong K, Syhakhang L, Wahlstrom R. Reproductive tract infections among women attending a gynecology outpatient department in Vientiane, Lao PDR. *Sex Transm Dis* 2007; 34: 791-5.
21. Oliveira F, Pflieger V, Lang K *et al*. Sexually transmitted infections, bacterial vaginosis, and candidiasis in women of reproductive age in rural Northeast Brazil: a Population-based study. *Mem Inst Oswaldo Cruz* 2007; 102: 751-6.
22. White S, Lassen P. *Candida albicans*: Morphogenesis is influenced by estrogen cell. *Mol Life Sci* 1997; 5: 744.
23. Zhao X, Malloy DPJ, Ardies CM, Feldman D. Estrogen-Binding protein in *Candida albicans*: antibody development and cellular localization by electron immunocytochemistry. *Microbiol* 1995; 141: 2685-92.
24. Sihavong A, Phourthavane T, Sayabounthavong K *et al*. The prevalence of lower genital tract infections among antenatal care (ANC) clinic patients in two central hospitals, Vientiane, Lao People's Democratic Republic. *Southeast Asian J Trop Med Public Health* 2006; 37: 190-9.
25. Kevis F, Mark AK. Are racial differences in vaginal pH explained by vaginal flora. *Amer J Obstet Gynecol* 2004; 191: 747-50.
26. Manandhar R, Sharma J, Pokharel BM, Shrestha BI, Pradhan N. Bacterial vaginosis in Tribhuvan University Teaching Hospital. *J Inst Med* 2005; 27: 14-7.
27. Nelson DB, Macones G. Bacterial vaginosis in pregnancy: current findings and future directions. *Oxford J Epidemiol Review* 2002; 24: 102-8.