

# The Prevalence of Gonococcal Infection in Non Pregnant Women

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## Abstract

**Background:** There is little information about the prevalence and risk factors for *Neisseria gonorrhoeae* in Iran. The purpose of this study was to determine the prevalence and risk factors of gonococcal infection in women in Babol, North of Iran.

**Methods:** Five hundred- fifty married women, who were younger than 45 years, were assessed of aspects of hidden and obvious gonococcal infection. A sample of endocervix was obtained for gram stain and culture for gonorrhoeae in chocolate agar medium. Socio-demographic, behavioral and clinical variables also were recorded.

**Results:** The mean age of these women was 32.3± 6.6 yr old (range 17 to 45 yr). The prevalence of *N. gonorrhoeae* (NG), *Chlamydia trachomatis*, and *Trichomonas vaginalis* was 0.2%, 11.6%, and 4%, respectively. The case of NG was asymptomatic and did not have any risk factors for this infection.

**Conclusion:** The results of this study show that the prevalence of this infection in this region is relatively low.

**Keywords:** Sexually Transmitted Diseases, *Neisseria gonorrhoeae*, Female Urogenital Diseases, Prevalence, Iran

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## Introduction

Gonococcal infection is one of the common bacterial infections especially in developing countries (1, 2). Human is considered as the natural host of this disease. It is often transmitted through sexual contact. The disease has wide spectrum of the signs and symptoms (symptomatic up to asymptomatic). The prevalence of disease varies from 0.3% to 22% in different communities (3). In one study in Kerman, the prevalence of genital gonococci was reported as 0.4% (4). In some studies, the application of syndromic treatment (treatment based on the clinical diagnosis) is suggested (5, 6). But in other studies, the advantages of these treatments have not been established (7, 8).

This study was conducted to assess the prevalence and risk factors of this disease.

## Materials and Methods

Five hundred fifty specimens of endocervical discharge were obtained from November 2003 to October 2004. The samples were obtained from women at reproductive age (15-45 yr) who were examined gynecological for different complains. Age, marital status, educational level, husband's job, gravidity, history of infertility, ectopic pregnancy (EP), pelvic Inflammatory disease (PID) and sexual diseases, chief complain, and clinical findings, were recorded by a questionnaire. Informed consent was obtained by all cases. To diagnose of *Neisseria gonorrhoeae*, first excessive exudates were wiped with sterile cotton swab, and then one sample was obtained from endocervix by a sterile applicator. At first, the direct smear that was obtained from the genital tract was stained by gram stain. Typical intracellu-

lar Gram- negative diplococcus would be read as presumptively positive for *gonorrhoeae*. The specimens taken from the genital tract were cultured on chocolate- agar and isolated carefully. They were maintained in CO<sub>2</sub> jar at 37 °C for 24-72 h. Then one smear was prepared from suspicious samples. It was stained with gram stain. We screened colonies on chocolate agar that resembled those of *N. gonorrhoeae* by oxidase test, with dropping the fresh reagent (tetramethyl- p- phenylenediamine dihydrochloride) directly onto the colony on the agar surface. Oxidase positive colonies turned purple, darkening with time (10 s). For diagnosing *Chlamydia trachomatis*, a blood sample was taken for ELISA test. *Chlamydia* IGA and IgG were detected by standard commercial producing kits. A vaginal discharge sample was taken for *Trichomona vaginalis* (TV) using Wet Smear as follows: samples were placed into a tube containing 0/5 ml of normal saline and delivered to a bacteriology dept of laboratory immediately. Direct wet mount was formed from this specimen and examined for the presence of TV under low and high power field (440× and 200×) of light microscopic. Exclusion criteria were pregnancy, abnormal uterine bleeding and use of antibiotic during the last four weeks.

**Results**

The mean age of women was 32.3± 6.6 yr old. The prevalence of *gonorrhoeae*, *C. trachomatis*, and *T. vaginalis* among participants were 0.2%, 11.6%, and (4%), respectively. Gonococcal infection did not accompany with *Trichomonas* or *Chlamydia* infection. The prevalence of gonococcal infection was the same in all studied variables (Table 1).

Forty percent of patients had cervical discharge in addition to inflammation of genital tract and lower abdominal tenderness with different severities. The most frequent signs were cervix ectopy (18%) and lower abdominal tenderness (16.9%) and the most frequent diagnosis was cervicitis (24.5%).

Gonococcal infection was related to a 27 yr old woman who had one child and elementary education. She was housekeeper and had attended to get Pap smear and had not mentioned any gynecological problems. Her clinical examination was normal. She had not any history of STD, PID, EP and infertility. Her husband was 32 yr old. He was a worker and had elementary educational level. Their average income was less than \$120 monthly and economical status was low level and they did not save. He was using condom as contraception during 6 mo ago. He has not ever heard of STDs.

**Table 1:** Frequency of studied variables in 550 women attended to health care centers of Babol

variables	n	%
Education of women		
-Illiterate	46	8.14
-Primary school	247	44.9
-High school	78	14.2
-Diploma	138	25.1
-Academic	41	7.5
Job of husband		
-Unemployed	18	3.3
-Worker	144	26.2
-Employee	89	16.2
-Grocery store worker	225	40.9
-Military recruits	6	1.1
-Truck driver	68	12.4
History of infertility		
-Yes	42	7.6
-No	508	92.4
History of STD		
-Yes	1	0.2
-No	549	99.8
History of PID		
-Yes	121	22
-No	429	78
History of EP		
-Yes	2	0.4
-No	548	99.6
Chief complain		
-Urogenital complaints	326	59.3
-Routine check up	224	40.7

## **Discussion**

*Gonorrhoeae* is an infectious disease of genital tract that is simply transmitted via sexual contact. After one coitus, the probability of infection in a sensitive woman is 50-70% and in a susceptible man is 25-30% (9).

The symptoms of disease in 50% of women, as opposed to men, are hidden or not considerable. This disease is important because of its transmission to neonates and others by prostitutes. According to the performed researches, the rates of infection in women in some parts of the world are as follows: Newcastle 0%, Malaysia 0.54%, Norway 0.3%, several cities in America 2.7-6%, Ghana 3.4%, villages of Cameroon 22% (3). The incidence of *gonorrhoeae* among patients who attended STI clinics in Western Europe were reported 1-5% and in Australia 15-30% (10). African women have been infected more than other nations (11).

There is very limited data about the epidemiology of gonococci infection in Iran and indicates that the prevalence of this disease is low. The rate of infection in Iranian women, who are affected by cervicitis, was recorded as 1.94 % (12). In Kerman, the incidence of this infection among asymptomatic and symptomatic women was recorded 0.4 % (10). In one study in Tehran, frequency of gonococci was reported to be 12 (0.6%) (13). In another study, which was performed in prisoner women, the prevalence was 0.89 % (14).

In other studies no cases were reported in Iran (15-17) and in our study, the prevalence was low, so in comparison with other countries, the prevalence of gonococcal infection in Iranian females is relatively low.

We applied classic way of laboratory diagnosis for detection of gonococcal infection in this research. It was based on detecting *Diplococcus* Gram-negative positive oxidase test that grows up on the culture environment. The accuracy and sensitivity of this procedure for the samples taken from genital tracts of males and females are 99% and 90%, respectively (18).

The results showed that gonococcal infections could occur for asymptomatic women who had not any risk factor and its incidence is low even in symptomatic women. Therefore, in our country, the application of laboratory diagnosis procedures instead of protocol of WHO syndromic treatment can be useful.

On the other hand the increase resistance to current drugs in gonococcal treatment is concerning. It seems that one of its causes is the irregular use of these drugs. Therefore communication between clinic and laboratory is needed to ensure optimal treatment of infection. Also these drugs are expensive and are regularly used in patient's treatment, whereas the disease is not prevalent. Therefore, using them is not cost-effective. In addition with regarding the low probability of transmission of gonococcal ophthalmia infection to neonates of affected women, the protection program against neonatal conjunctivitis is not necessary (4).

Our findings are against WHO recommendation that patients infected with gonorrhoeae also should be treated routinely with an anti-chlamydial regimen (19). In conclusion, the prevalence of gonococcal infection in women in their reproductive ages is very low in our country. Suspected women should be evaluated and treated appropriately.

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## **References**

1. Saebi S (1996). *Infection disease in Iran*. 1<sup>st</sup> ed. Rosebahan publishing, Tehran, Iran, pp.: 235-367
2. Dun Can ME, Reimann K (1999). Epidemiology study of gonorrhea in Ethiopian women. *Genitourin Med*, 67(5): 465-92.
3. Lage M, Meneus A (2004). Epidemiology and control of gonococcal ophthalmia neo-

- natorum. *Bull world Health organ*, 67(5): 471-77.
4. Islami- Nejad Z, Safarian Sh (1995). Preliminary study of the prevalence of gonococcal genital infection in 500 non pregnant women referring to a private and a public clinic in kerman, Iran. *J of Kerman University of Medical Sciences*, 3(5):135-39.
  5. Mukenge- Tshibaka L, Alary M, Low Ndes CM (2002). Syndromic versus laboratory- based diagnosis of cervical infections among female sex workers. *Sex Transm Dis*, 29(6): 324-30.
  6. Mayaue P, Ka- Gina G, cornelissen J (1998). Validation of a WHO algorithm with risk assessment for the clinical management of vaginal discharge in mwanza, Tanzania. *Sex Transm Infect*, 74 suppl 1: S77-84.
  7. G Dowe, M Smikle, SD king (1999). High prevalence of genital chlamydia trachomatis infection in women presetting in different clinical settings in Jamaica: Implications for control strategies. *Sex Transm Infect*, 75: 412-16.
  8. Mathews C, Van Rensburg A, Coetzee N (1998). The sensitivity of a syndromic management approach in detecting sexually transmitted disease in patients at a public health clinic in Cape Town. *S Afr Med J*, 88(10): 1337-40.
  9. Morse SA (1991). Neisseria Gonorrhoea. In: Barons *Medical microbiology*. Anonymous. 3<sup>rd</sup> ed, Churchill livingston Co. New York, pp.: 231-41.
  10. Islami nejad, Z, Safarian SH (1995). A Preliminary study of the prevalence of gonococcal genital infection in 500 non pregnant women referring to a private and a public clinic in Kerman, Iran. *J of Kerman University of Medical Sciences*, 2(3): 135-39.
  11. Nzlia N, Lage M (1991). HIV and other sexually transmitted diseases among female prostitutes in Kinshasa. *AIDS*, 5(6): 715-21.
  12. Ghasemian- Safaii H (1989). Assessment of cervical infection in the labor of Akbarabadi Hospital (MS thesis). School of Midwifery, Tehran University of Medical Science, Iran.
  13. Izadi Mood N, Rashed Marandi F, Niroo Manesh Sh (2003). An investigation of prevalence of genital tracts gonococcal infection in women who were referred to Mirza Kouchak Khan Hospital in their fertility ages (15-44 y). *Iranian Journal of Infectious Diseases & Tropical Medicine*, 23(8): 51-53.
  14. Fakheri T, Hatami H, Zangeneh M (1996). The epidemiology study of endocervical gonococcal infection in the prisoner ladies in Kermanshah. *Iranian Journal of Infectious Diseases & Tropical Medicine*, 21(8): 17-5.
  15. Badami, N (1992). Assessment of chlamydia ratio in the patients with cervicitis and urthritis in Tehran and Bandarabas (MS thesis). School of Midwifery, Tehran University of Medical Sciences, Iran.
  16. Bazargani A (1992). Assessment of cervical chlamydia infection in Shiraz (MS thesis). School of Midwifery, Shiraz University of Medical Sciences, Iran.
  17. Naeimi, N (1995). Assessment of Normal Vaginal bacterial flora and correlation it with microbiology tests in vaginitis (MS thesis). School of Midwifery, Tehran University of Medical Sciences, Iran.
  18. Vlasploder F (2003). Value of a DNA probe assay compared with that of culture for diagnosis of gonococcal infection. *Clin Microbiol*, 31(1): 107-10.
  19. Chen XS (2006). Co-infection with genital gonorrhoeae and genital chlamydia in female sex workers in Yunnan, China. *Int J STD AIDS*, 17(5): 329-32.