PREVALENCE OF GONOCOCCAL INFECTION AMONG THE PATIENTS VISITING AT DERMATOLOGY/VENEROLOGY AND GYNAECOLOGY DEPARTMENT OF TRIBHUVAN UNIVERSITY TEACHING HOSPITAL

Panta B¹, Tuladhar N R²
Sharma A P³, Sharma J⁴, Jha A K⁵

ABSTRACT

A substantial proportion of women with gonococcal infection are asymptomatic but symptomatic in male. Thus in developing countries, problem arises in active case detection where laboratory facilities for testing are limited. During the study, the diagnostic validity of the hierarchical clinical algorithm as well as that of a non-hierarchical scoring system were assessed among 102 patient visiting at Dermatology/Venerology (DV) and Gynecology(Gynae) out patient department(OPD) of Tribhuvan University Teaching Hospital (TUTH), Kathmandu, Nepal. In the study period of 8 months, May–December 1999, 9 (8.82%) were infected with *N. gonorrhoea* & 2(1.96%) with Gram Negative intracellular diplococci. Age group of 20-30 years were found to be more infected followed by age groups 30-40 years & 40-50 years ($P < 0.10$). The male were found to be predominantly infected than female and married were found to be more infected than unmarried. Among the infected people most of them had secondary level education and least of them had higher level education. Service holders were found to be more infected than farmers, drivers & others. But male service holders & housewives were equally infected.

Antimicrobial susceptibility of *N. gonorrhoea* showed 100% susceptible to Ceftriaxone, followed by Ciprofloxacin (88.88%) whereas 22.22% resistant to Tetracycline, 55.55% to Cotrimoxazole and 55.55% to Penicillin. Among isolates, 33.33% were β -lactamase producer. Co-micro organisms like *Candida spp* and *Staphylococcus spp* were also observed.

Key Words: *Gonococcal infection; Outpatient department, Antimicrobial susceptibility, Nepal.*

1. Research Officer, Infectious and Tropical Disease Research Centre, Tripureshwor, Kathmandu, Nepal.
2. Associate Professor, Head of Department, Clinical Microbiology, Institute of Medicine, TUTH, Nepal.
3. Professor, Central Department of Microbiology, Kirtipur, Kathmandu, Nepal.
4. Associate Professor, Department of Obstetrics/ Gynecology Department, Institute of Medicine, TUTH, Nepal.
5. Assistant Professor, Head of Dept., Dermatologist, Venerologist & Leprologist, Dept. of Dermatology/Venerology, Institute of Medicine, TUTH, Nepal.

Address for correspondence : Binita Panta, Research Officer, Infectious and Tropical Disease Research Centre, Tripureshwor, Kathmandu, Nepal.
P.O. Box: 8973, NPC 565
Tel: 493680 (Res.), Email: gyan@col.com.np

INTRODUCTION

The term "Gonorrhoea" was first derived from the Latin word (Gono = pus-like, rhoea = discharge). Gonorrhoea has history stretching back into antiquity and entirely ignorant of the time and place of its first appearance. But it is mentioned many times in biblical writings. The causative organisms *Neisseria gonorrhoea* was discovered in 1879 by Neisser.¹ Among the Sexually Transmitted Diseases (STDs), gonorrhoea is a common cause of illness in the world and have far reaching health, social and economic consequences. In addition to their sheer magnitude, gonorrhoea is a major public health problem for two additional reasons: its serious sequelae and the fact that they facilitate transmission of HIV. The STDs, like gonorrhoea is mainly transmitted through sexual contact and sometimes from mother to child before or during birth. It generally affects the male & female reproductive tract and sometimes eyes in case of neonates, leading to blindness.²

Recent WHO estimate put the number of new case of gonorrhoea world wide at 62 million annually.³ According to result of DV department of TUTH, 32% of *N. gonorrhoea* were detected.⁴ Despite a substantial decrease in the incidence of gonorrhoea in western countries in the past decade, a major burden of gonococcal disease remains in less developed countries and amongst the socially marginalized in the developed world.⁵ Control of gonococcal disease in made more difficult due to the emergence of drug resistant strains, so a programme on surveillance of antimicrobial susceptibility in *N. gonorrhoea* should also be taken as an integral part of a routine test. Although early diagnosis and treatment could prevent these complication, as gonococcal infection is asymptomatic in women and many infected women fail to seek healthcare.

METHODOLOGY

Between May 1999 to December 1999, *N. gonorrhoea* were isolated from the 102 patients attending DV and gyanae OPD of TUTH, Kathmandu (Male: 20 & Female: 82)

As most of woman have asymptomatic infection, woman complaining with vaginal discharge, burning micturation, lower abdominal pain, infertility, stillbirth, back pain etc. were enrolled in the study to trace out if causal organisms is gonococcus or not. Male presenting with pus discharge, or watery, sticky discharge, burning & urgency of micturation, prepusal swelling or any complain in genital organ with discharge were included. Then direct queries were done in order to get all the necessary information required for the study. In case of female, endo-cervical swabs and in case of male, urethral swabs were taken and streaked on modified Thayer Martin (TM) Agar and on Chocolate Agar (CA). Also smears were prepared on glass slide for gram staining. The identification of the organisms was confirmed by colony morphology, gram staining, oxidase test & catalase tests. Further re-confirmed by inoculation in Nutrient Agar where no growth was observed as recommended by.⁶

Antibiotic sensitivity test was performed by Kirby Bauer Disc Diffusion method modified by NCCLS 1995,⁶ where antimicrobial disc containing penicillin (10 U disc) Tetracycline (30 mg), Ciprofloxacin (5 mg), Ceftriaxone (30 mg) and Cotrimoxazole (25 mg) were used (all from oxoid, Hampshire U.K.) and the zone of inhibition was interpreted according to NCCLS.⁷ All penicillin-resistant isolates were tested for β -lactamase production by chromogenic cephalosporin method.⁶

RESULTS

Among the endo-cervical swabs and urethral swabs (n = 102), 9 (8.82%) were culture positive for *N. gonorrhoea* & 2 (1.96%) Gram negative diplococci but negative in culture and 34 (31.19%) cases showed the presence of pus cells in microscopic examination. Age group of 20-30 years were found to be more infected (55.55%) followed by age group 30-40 years (22.22%) and age group 40-50 years (22.22%). Male were found to be more infected in comparison to female and infection rate was found to be high among the married people.

Figure 1: Age-wise distribution of infected patients (n = 9)

Figure 2: Genderwise and Marital Status of Infected Patients (n=9)

Figure 3: Educational Status of Infected Patients.

Table I : Occupational Status of the Infected Patients (n=9) and their Partners'.

Occupation	Patients's (%)	Their Partners' (%)
Housewife	33.33	22.22
Service	33.33	11.11
Farmer	11.11	22.22
Driving	11.11	-
Other	11.11	11.11
Total	100	66.66

Housewives and service holders were most common suffers and regarding their partner most of them were housewives and farmers followed by service holders and others.

Table II: Patients' Complaints (n=102)

Complaints	No.	%
Lower abdominal pain	54	52.94
Abortion/miscarriage	27	26.47
Pain in genital organ	13	12.74
Genital sore/ulcers	6	5.88
Still birth	5	4.90
Infertility	3	2.94
Swelling of prepuce	2	1.96

In the study the highest study population have had lower abdominal pain followed by other complains whereas lowest study population have had complain of infertility and swelling of prepuce.

The study showed that the Ceftriaxone was 100% susceptible where as Penicilline was least effective. Among the total isolates, 33.33% were β -lactamase producers.

Figure 4: Antimicrobial Susceptibility of *N. gonorrhoea* isolates (n=9).

CLINICAL FINDINGS

In the study, 6 (30%) had moderate to profuse urethral discharge, 9 (45%) had purulent urethral discharge, 45 (54.87%) moderate to profuse cervical exudation, 4 (4.87%) purulent secretion and 22 (26.82%) mucopurulent secretion.

DISCUSSION

Sexually transmitted diseases take a great roll on health through their sequelae, i.e. conditions resulting from the spread of STD pathogens from the point of infection usually to another part of reproductive tract, such as the fallopian tubes in women. Sequelae of some STDs is Pelvic Inflammatory Disease (PID), which is a common serious complication of *N. gonorrhoea* and *Chlamydia trachomatis*, tubal disease, infertility, chronic pain and disability requiring multiple hospitalization and surgery.² Also in men, untreated gonorrhoeal & Chlamydial infection can cause painful inflammation of the testes & infertility by blocking the sperm ducts, also formation of sinus & fissure in genital organ.

In the present study, 9(8.82%) were *N. gonorrhoea* positive & 2 (1.96%) were Gram negative

intracellular diplococci but negative in culture. As those patient have had antibiotic treatment for since last five days, so the organism were non viable and only seen in Gram staining in spite of growing on culture media. During the period 1990-1993, prevalence rate of symptomatic and asymptomatic gonorrhoea among the women attending antenatal clinics in Cameroon were approximately 12% and ranged from 3.8% in Cote d'Ivoire to 14% in Botswana.² In many western countries, incidence of gonorrhoea has declined since the mid- 1970s; during the past year, however, evidence that the incidence of gonorrhoea is on the increase again in these countries, as in the developing countries, has emerged. Similarly prevalence rate of gonorrhoea was 10% in Bottambay which is comparable to our study and varied in 39% in Sisophan⁸ and 9% of woman had a GC positive with moderate PID.⁹

As the years passes on, there is gradual change in socio-economy status of each countries, which rules the public health. This change in socio-economic status could be the cause of difference of findings of some other's of study. In the study, Polymorphic neutrophils (puscells) were seen in 34 (31.19%) case indicating that they might have suffered from the infection in past.

Gonorrhoea remains a major cause of morbidity in sexually active individuals, and most of the cases are projected to occur in developing countries, like South East Asian Region. The control of gonococcal infection is important, considering high incidence of acute infections, complications, sequelae and role of gonorrhoea in facilitating HIV acquisition and transmission. In the study, the highest incidence of infection was seen in the young adults of age group 20-30 years followed by age group 30-40 & 40-50 years ($P < 0.10$), as shown in Fig: A. This may be because the people at these age are more active in life and have high chance of acquiring STD infection. Male being more infected, may be due to the male having more than one casual sex partner and which is very rare in case of female in context to Nepal; also being symptomatic may be the additional cause. The infection rate was high among married people, this may be because in case of married people (Fig:B) if one partner get infected very quickly there is high chance of transmitting infection to another partner. Also in the present study service holders & house wives were equally infected. This may be because, most of the infected clients were married; they might have infected their house wives.

Selection of resistant bacteria began on global scale in the early 1940s was with the introduction of the first penicillin in to clinical use. It increased over the next 50 years as a large number of antibiotic with different mechanisms of action were introduced, which can be linked to overuse and misuse of antibiotics.¹⁰ The antimicrobial sensitivity test for all isolate showed Ceftriaxone to be 100% effective which is well correlated to the study of Adegbola *et al.*¹¹, Ryan *et al.*⁷ & Ministry of Health, Nepal.¹² Where as penicillin was 44.44% & 55.55% were moderately susceptible to tetracycline, it is comparable to the findings of Bhuiyan *et al.*¹³ Tetracycline resistant *N. gonorrhoea* (TRNG) isolates are likely to spread

more quickly than PPNG. The resistant to penicillin through β -lactamase production or chromosomal mechanism was wide spread with high level of tetracycline resistant.¹⁴ In our study, 33.33% were PPNG and TRNG 22.22%, Ciprofloxacin resistant 11.11%, penicillin resistant 55.55% and Cotrimoxazole 55.55%. But TRNG prevalence was 4% in 1991, 5.3% in 1992, 10.8% in 1994 exploding 52.2% in 1995.¹⁵

The data shows that resistant to commonly used antimicrobial agents have increased and consequently penicillin & tetracycline can no longer be recommended for the treatment of gonococcus. Surveillance is an integral part of controlling resistance. A co-ordinated multidisciplinary approach is required to tackle this problem. Prevention and control of emergence and dissemination of antimicrobial resistant organism must be establish as a strategic priority for international and national public health agencies as well as for individual institutions and health care practitioners.

ACKNOWLEDGEMENT

We are thankful to National Centre for AIDS and STD Control, UoH, STD/HIV Project, Teku and RONAST for the financial support for the preparation of this work. We are also obliged to Dr. Jeevan Bahadur Serchand, Associate Professor, TUTH and also thankful to Gyanae and DV OPD of TUTH.

REFERENCES

1. Topley & Wilson (1996). Principles of Bacteriology, Virology and Immunology; Geoffrey R. Smith and Chales S.F. Easman, Vol. 3, 8th Edition.
2. WHO (1994). An Overview of Selected

- Curable Sexually Transmitted Diseases, WHO, Geneva.
3. WHO (1996). Report of the Director General WHO, Geneva.
4. Jha, Anil Kumar (1999) Sexually Transmitted Diseases in Nepal and The Developing World. Frontline Incorporating the CME Bulletin, A Journal for Nepal's District Hospital Doctors. Vol. 3, No.3, Sept. pp. 3-8.
5. Tapsall J.W. (1995). Surveillance of antibiotic resistance in *Neisseria gonorrhoeae* and implications for the therapy of gonorrhoea, International Journal of STD and AIDS, 6: pp. 233-236.
6. WHO (1999). Laboratory Diagnosis - Gonorrhoea, WHO Regional Publication, South East Asia, Series No. 33.
7. NCCLS (1994). Zone Diameter Interpretive Standards and Equivalent Minimum inhibitory Concentration (MIC) Breakpoints for *Neisseria gonorrhoeae*, National Committee for Clinic Laboratory Standard (NCCLS), Vol. 14, No. 16.
8. Ryan C.A., Vathiny O.V., Gorbach P.M. *et al.* (1998). Explosive spread of HIV-1 and Sexually transmitted disease in Cambodia, The Lancet, Vol. 351, April 18.
9. Hoosen A.A., Abdul H., Moodley J. *et al.* (1996). Sexually Transmitted Infection in ambulatory patients with pelvic inflammatory disease, Journal of obstetrics and Gynecology (Abing don), 16 (6): pp. 544-547.
- 10 GASP Newsletter(1998), A SEARO Newsletter on Gonococcal Susceptibility Program, Vol. 2.1: 1998 p- 1
11. Adegbola R.A., Sabally S., Corrab T., *et al.* (1997). Increasing prevalence of penicillinase - producing *Neisseria gonorrhoea* and the emergence of high level, plasmid-mediated tetracycline resistance among gonococcal isolates in the Gambia, Tropical Medicine and International Health, 2(5): pp. 428-432.
12. Ministry of Health/Nepal (1998). Specific STD in Symptomatic patients attending DV and Gynae OPD, Department of Health Service, National Centre for AIDS and STD Control, University of Heidelberg.
13. Bhuiyan B.U., Rahman M. Aminmiah M.R. *et al.* (1999). Antimicrobial susceptibilities and plasmid contents of *Neisseria gonorrhoeae* isolates from commercial sex workers in Dhaka, Bangladesh: Emergence of high-level resistance to ciprofloxacin, Journal of Clinical Microbiology, pp.1130-11.
14. WHO(1997). Surveillance of antibiotic susceptibility of *Neisseria gonorrhoeae* in WHO western pacific region, Western Pacific Region Gonococcal Antimicrobial surveillance Programme, Genitourin med, 73: pp. 355-361.
15. Dyck V.E., Erabble F., Nzila N., *et al.* (1997). Increasing resistance of *Neisseria gonorrhoea* in West and Central Africa Consequences on therapy of gonococcal infection, Sexually Transmitted Disease, 24 (1): pp. 32-37
16. Cheesbrough M. (1986). Medical Laboratory Manual for Tropical Countries, Vol. II, Tropical Health Technology, London.