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Research Article

**ENHANCEMENT OF RESISTANCE TO ANTIBIOTICS IN NEISSERIA
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Abstract:

Objectives: The aim of this research work is to find out the causes of the enhancing pattern of the hindrance to the frequently utilized antibiotics by the NG (*Neisseria Gonorrhoeae*) diagnosed instantaneously in the smears of gram-stained smears & cultures of the secretions of urethra.

Methodology: This was a retroactive research work in which the detection of the NG from the obtained urethral or prostatic discharges/secretions & their anti-bio gram carried out. Total 133 patients from male gender suspected of having NG visiting the outpatient department of the Skin and V.D. in the Gangaram Hospital Lahore from February 2018 to December 2018 were the part of this research work. The collection of the secretion of urethral or prostatic carried out from the suspected patients of NG. The smears of gram-stained for the identification of the gram negative diplococci with the utilization of microscope and chocolate agar media carried for all the collected samples from the suspected patients. The testing of anti-microbial susceptibility with the utilization of the standard method of disc diffusion conducted utilizing antibiotics which were frequently available in the treatment against gonorrhoea.

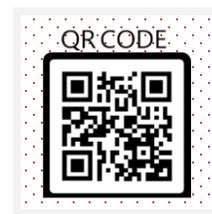
Results: An important amount of the patients was available as positive for NG in both type of secretions of urethral & prostatic. The basic tools for the identification of the NG both examination with the help of microscope and culture were comparable equally with one another. The isolates of the bacteria displayed around 11.6% resistant patients against drugs of Ciprofloxacin & Gentamycin whereas Penicillin & Amoxicillin were available as the low effectual medicines. There was an equivocal sensitivity for the drugs of Cephalexin, Doxycycline and Tetracycline.

Conclusion: This research work emphasize the microscopic examination of the gram stained smears as best tools for the fast identification of NG. It also discovers the fact of highly enhance pattern of resistance to antibiotic by the NG to the very common drugs available in the prescription.

KEYWORDS: Prescription, NG, Tetracycline, Ciprofloxacin, Secretions, Gonorrhoea, Suspected.

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INTRODUCTION:

Regardless of the substantial reduction in the prevalence of the disease of gonorrhoea in countries of the West in some past years, in main weight of this disease was prevailing in the countries which were under development and undeveloped ones and in some countries of the modern world [1]. research work on large samples conducted in Africa, Asia & Latin America concluded that the occurrence of very high in sub Saharan Africa & lower part of Latin America as well as Asia [2]. Although the occurrence of this complication decreasing in most of the countries but with the enhancement in the resistance to antibiotics particularly the antibiotics which are very common in use, the effective treatment for the complication of gonorrhoea is now a real issue. The patterns of anti-microbial susceptibility are very much different in various geographical areas. This causes in low levels of plasma of the drug & a state conducive to the assortment of resistant transmuted [3].

The effectiveness of different gonococcal treatment régimes is depending upon the kind, degree & occurrence of the resistance to the antibiotics in the population suffering from these complications with the result of treatment very nearly paralleling the in the absence of oxygen susceptibility the organisms which are offending [4]. Because majority of the treatment carried out before the outcome of the test results on the isolates from persons, the formulation of the therapeutic schedules on the in vitro sensitivity of occurring gonococci for awareness. This is the complete pattern gonococci susceptibility socializing is a crucial factor of proper treatment from antibiotics rather than person strain susceptibility diagnosed on the basis of patient by patient [5].

Penicillin & its derived drugs were in use against the infection of these complications. But in current times, hindrance strains of NG to Penicillin have minimized its use in the practice in medical field. The new antibiotics as Spectinomycin & Cephalosporins are very effectual against the microbes to treat the complication of the gonorrhoea. In the same manner, there is an important amount of the resistant strains

developing against the antibiotics of Quinolone. We conducted this research work to identify the NG with the help of assessment through microscope of gram stained smears & culture of secretions from urethral & prostatic from only male patients.

PATIENTS AND METHODS:

The collection of the secretions of urethral and prostatic carried from all the patients under suspicion of the disease of gonorrhoea attending the microbiology department carried out in this research work. The duration of this research work was from February 2018 to December 2018. Inoculation of all the samples carried out on chocolate agar media & incubation carried out at three hundred and seventy centigrade in atmosphere of 5.0% to 10.0% carbon dioxide by the jar of candle extinction. The examination with the help of microscope carried out of gram stained smears for each participant to check the gram negative diplococci with the utilization of microscope of Olympus CH-20 microscope.

After a duration of forty-eight hours' incubation, the identification of the NG development by the standard steps of NG conducted for NG [6, 7]. The patients found with the development of bacteria other than NG were not the part of this research work. The testing of anti-microbial susceptibility of all the isolates carried out with the utilization of disc diffusion procedure [8] against Penicillin as ten units, Amoxicillin as twenty-five micrograms, Tetracycline as 30.0 µg, Doxycycline as 30.0 µg, Cephalexin 30.0 µg, Gentamicin as 10.0 µg & Ciprofloxacin as 10.0 µg.

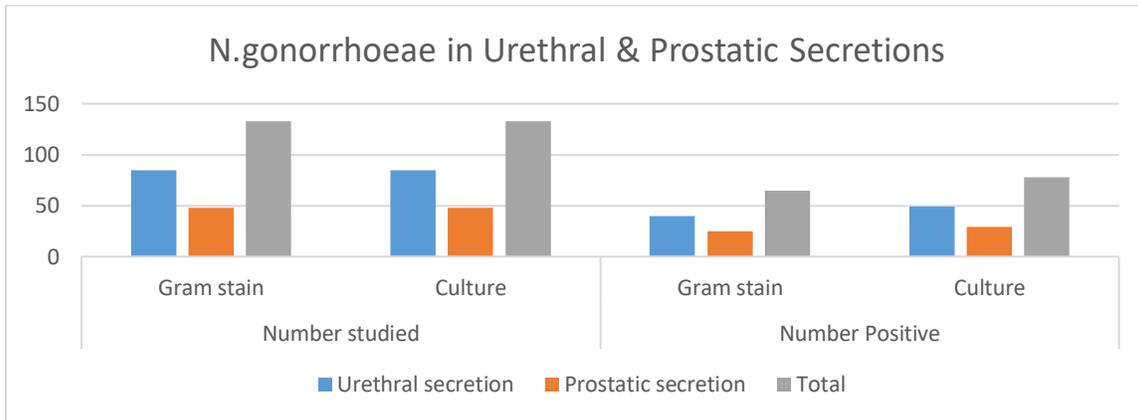
RESULTS:

Total one hundred and thirty-three samples were the part of this research work in which 63.91% (n: 85) were the discharges from urethra & 36.09% (n: 48) were the prostatic secretions. The examination with the help of microscope and culture of the secretions from urethra discovered 47.05% (n: 40) & 57.65% (n: 49) with NG accordingly. The NG positivity in the prostatic discharges with the help of examination through microscope and cultures were 57.08% (n: 25) & 60.42% (n: 29) correspondingly as mentioned in Table-1.

TABLE - I : Detection of N. Gonorrhoea in Urethral & Prostatic Secretions in Microscopy and Culture

Specimens	Cases Studied		Positive Cases	
	Gram stain	Culture	Gram stain	Culture
Urethral secretion	85.0 (63.910)	85.0 (63.910)	40.0 (47.050)	49.0 (57.650)
Prostatic secretion	48.0 (36.090)	48.0 (36.090)	25.0 (57.080)	29.0 (60.420)
Total	133.0 (100.00)	133.0 (100.00)	65.0 (48.870)	78.0 (58.650)

Parenthesis indicate percentage

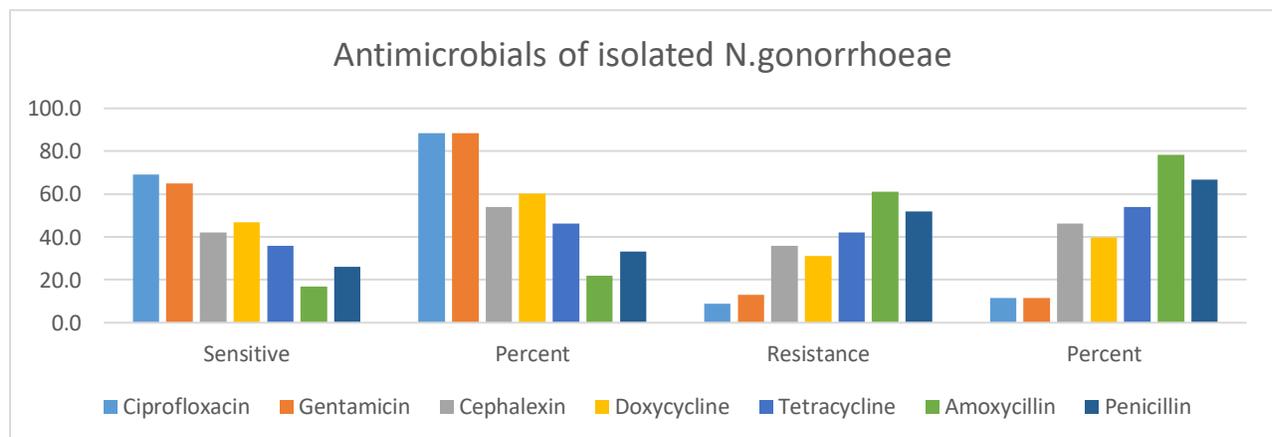


It is clearly visible from Table-1 that examination through microscope of all the specimens including both types of discharges showed 48.87% (n: 65) positive NG patients whereas culture of same amount of specimens stated 58.65% (n: 78) NG isolates.

Table-2 displays that the pattern of sensitivity & resistance of the separated ingredient against the frequently utilized antibiotics against gonorrhea. Ciprofloxacin & Gentamicin were the most effective medicines in current research work with only 11.54% & 11.67% patients with resistant accordingly. Doxycycline, Tetracycline & Cephalexin were effectual in 60.3%, 46.2% & 53.85% patients correspondingly. Penicillin & Amoxicillin displayed the minimum effectiveness against NG with effectiveness in only 33.33% & 21.8% patients correspondingly.

Table-II : Antibi Gram of Isolated N. Gonorrhoea (n : 78)

Antimicrobials	Sensitive	Percent	Resistance	Percent
Ciprofloxacin	69.0	88.460	9.0	11.540
Gentamicin	65.0	88.330	13.0	11.670
Cephalexin	42.0	53.850	36.0	46.150
Doxycycline	47.0	60.260	31.0	39.740
Tetracycline	36.0	46.150	42.0	53.850
Amoxicillin	17.0	21.790	61.0	78.210
Penicillin	26.0	33.330	52.0	66.670



DISCUSSION:

N. gonorrhoeae is the prompting factor of gonorrhoea, it is especially well-adapted cause of disease that is continuous is a cause of resistance to the agents which are anti-microbes. In current years, an intensity towards the enhancement of the increase in the resistance in both conventional and more current evolved therapeutic agents are under observation against *N. gonorrhoeae* [9]. It is very important to use the drug for the treatment of gonorrhoea to have awareness about the susceptibility of NG. The resistance to high level to penicillin & tetracycline in NG is plasmid mediated & an important therapeutic issue [10, 11]. In 1970, first description of penicillinases forming NG came into existence and have fully spread in the whole world and NG resistance to tetracycline elaborated in 1985 are very high occurring [12].

It is very clearly visible from this research work that assessment of gram stained smears through microscope is very excellent tool for the diagnosis of these infections in very rapid way. From the findings it is evident that the identification of the NG with the help of evaluation from microscope is very much comparable with the assessment through culture. There are many situations where the facilities for the cultures of bacteria are not present with the microscopy of the good quality can be helpful in the identification of the NG among the suspected patients. This is also real for the countries such as Bangladesh because there are many limited centers where regarding isolation rate, the recent research work is according to the other past works from this very department [13].

Ciprofloxacin is in regular use for the treatment of infection of gonorrhoea for about ten years [14]. According to a program of World Health Organization in 1995, Hong Kong, China, Vietnam & China had 7.70%, 15.50%, 5.50% & 15.50% patients of Ciprofloxacin resistant correspondingly. These results are very much similar to the outcome of recent research work. The resistance of high level to Penicillin were in the record in Vietnam as 98.0%, Korea as 90.0%, China as 84.0% & Malaysia as 80.0%. We stated that an important amount of the patients with penicillin resistance in this very setting. The pattern of resistance to the tetracycline in this research work was 54.0% which is comparable to the countries as in Malaysia as 58.50%, Singapore as 63.80% & Vietnam 42.30% [15]. Gonorrhoea is a cofactor for HIV transmission [16]. Good treatment of

sexual transmitted diseases can decrease the reduction of HIV [17].

CONCLUSION:

This research study emphasized the microscopic assessment of the gram stained smears as better methods for the fast discovery of NG. It also detected the fact of highly increased pattern of antibiotic resistance by the NG to frequently used drugs.

REFERENCES:

1. Percival A, Hart CA. Rationale for antimicrobial therapy of infections caused by multiply resistant *Neisseria gonorrhoeae*, In: Brooks GF, Gotschlich EC, Holmes KK, et al., eds. Immunobiology of *Neisseria gonorrhoeae*, Washington DC: American Society for Microbiology, 1978: 80-5.
2. Philpot CR, Tapsall JW. Single-dose antibiotic therapy for the treatment of uncomplicated anogenital gonorrhoea. *Med J Aust* 1987; 146: 254-6.
3. Cruickshank R, Deguid JP, Marimion BP and Swain RHA. *Medical Microbiology: The practice of Medical Microbiology*, 12th edition. Vol. II. Churchill Livingstone; Edinburgh 1975.
4. Finegold SM and Baron EJ: *Microorganisms encountered in the blood in: Bailey and Scott's Diagnostic Microbiology*; 7th edition. The C.V. Mosby Company 1989; 206-23.
5. Tapsall JW. Surveillance of antibiotic resistance in *N gonorrhoeae* and implications for the therapy of gonorrhoea. *Intern J STD & AIDS*. 1995; 6: 233-6.
6. Bauer AW, Kirby WMM, Sherris JC and Turk M. Antimicrobial susceptibility testing by a standardized single disc method. *Am J Clin Pathol* 1996; 45: 493-6.
7. Wasserheit JN. Interrelationships between immunodeficiency virus infection and other sexually transmitted diseases. *Sex Trans Dis*. 1992; 19: 61-77.
8. Tapsall JW. Use of a quality assurance scheme in a long-term multicentric study of antibiotic susceptibility of *Neisseria gonorrhoeae*. *Genitourin Med* 1990; 66: 8-13.
9. Tapsall JW. Antimicrobial resistance in gonococci; WHO Western Pacific region, 1995. *Comm Dis Intell* 1996; 20: 425-8.
10. Over M, Pilot P. HIV infection and sexually transmitted diseases HSPR 26, Washington, The World Bank 1991.
11. Grosskurth H, Mosha F, Todd J et al. Impact of improved treatment of sexually transmitted

- diseases on HIV infection in rural Tanzania: randomized controlled trial. *Lancet* 1995; 346: 530-6.
12. Moses JM, Desai MS, Bhosle CB and Trasi MS. Present Pattern of Antibiotic sensitivity of gonococcal strains isolated in Bombay. *Br J Vener Dis* 1971; 47: 273.
 13. Sparling PF. Antibiotic resistance in the gonococcus. In: Roberts RB, ed. *The gonococcus*. New York: John Wiley, 1977: 111-35.
 14. Knapp JS, Wongba C, Limpakarnjanarat et al. Antimicrobial susceptibilities of strains of *Neisseria gonorrhoeae* in Bangkok, Thailand. *Sex Transm Dis* 1997; 24: 1-6.
 15. Catherine AI. Antimicrobial agents and gonorrhoea: therapeutic choice, resistance and susceptibility testing. *Genitourin Med.* 1996; 72: 253-7.
 16. Ahmed I, Salam MA, Amin AA, et al. *Neisseria gonorrhoeae*: Rate of Isolation and Antimicrobial Susceptibility Pattern. *Bangladesh J Dermatol Venereol Leprol* 1999; 16(1): 14-6.
 17. Echols RM, Heyd A, O'keefe BJ, Schacht P. Single-dose Ciprofloxacin for the treatment of uncomplicated gonorrhoea: a worldwide summary. *Sex Transm Dis* 1994; 21: 345-52.