Antibiotic resistance in *Neisseria gonorrhoeae* isolated from a tertiary care center in North India

Sir,

Gonorrhea, is the most prevalent bacterial sexually transmitted infection (STI), with 78 million cases among adults estimated in 2012 worldwide.[1,2] Causative agent *Neisseria gonorrhoeae* has developed resistance not only to penicillins and tetracyclines but also to fluoroquinolones. Additionally, resistance to extended-spectrum cephalosporin (ESC) is being reported in countries such as Japan, France, Germany, Greece Norway, and China.[3,4] Although resistance to ESC has not yet been reported in the Southeast Asiatic region, strains showing decreased susceptibility to ceftriaxone have been reported.[4] We present a prospective study to evaluate antibiotic resistance in Neisseria gonorrhoeae isolates from suspected STI from a tertiary care center in North India.

We cultured urethral swab of 15 males and cervical swab of 89 females attending STI clinic with symptoms suggestive of gonorrhea at a tertiary

care center of North India, between October 2013 and December 2015. Specimen was collected on a sterile cotton swab, transported immediately to the laboratory, cultured on chocolate agar made from trypticase soy agar with 5% sheep blood (BioMérieux, France) and incubated overnight at 37°C in 5% CO_2. Gram stain of direct smear was done for all specimens. Bacterial isolates were identified by standard biochemical tests, and antimicrobial susceptibility testing was done by Kirby–Bauer disc diffusion method as per recommendations of the Clinical and Laboratory Standards Institute.[5,6] Isolates were lyophilized in skimmed milk and sent to Apex Regional STD Teaching, Training and Research Centre, V.M. Medical College & Safdarjung Hospital, New Delhi, for confirmation, calibrated dichotomous susceptibility testing (CDS), and determination of minimum inhibitory concentration of antibiotics.[7]

Out of 15 male patients, urethral discharge of six patients showed growth of *N. gonorrhoeae*. Intracellular gram-negative diplococci were seen on direct smear of urethral discharge with gram staining of all six specimens. None of the cervical swabs from women suffering with cervicitis showed growth of *N. gonorrhoeae*.

Using CDS methodology, three *N. gonorrhoeae* isolates were found resistant to penicillin due to the presence of beta-lactamase (penicillinase-producing *N. gonorrhoeae*), while two were less susceptible without beta-lactamase [Table 1]. Of these six isolates, five were resistant to ciprofloxacin. None of the isolates was found resistant to cephalosporins, spectinomycin, or azithromycin.

Table 1: Antibiotic sensitivity profile in *Neisseria gonorrhoeae*

Antibiotics	CLSI guidelines method (*n*=6)			CDS method (*n*=5)*		
	R	MS	S	R	LS	S
Penicillin[a]	4	2	0	3 (PPNG)	2	0
Ciprofloxacin[b]	5	-	1	5	0	0
Spectinomycin	-	-	-	0	0	5
Tetracycline	3	1	2	4 (TRNG)	1	0
Azithromycin	-	-	-	0	0	5
Cefixime	-	-	-	0	0	5
Ceftriaxone[c]	1	0	5	0	0	5

By the Clinical and Laboratory Standards Institute guidelines and calibrated dichotomous susceptibility method. *One *Neisseria gonorrhoeae* isolate sent to apex laboratory could not be revived; [a]Penicillin disc potency: 10 IU (CLSI guidelines), 0.5 IU (CDS method); [b]Ciprofloxacin disc potency: 5 µg (CLSI guidelines), 1 µg (CDS method); [c]Ceftriaxone disc potency: 30 µg (CLSI guidelines), 0.5 µg (CDS method). PPNG=Penicillinase-producing *Neisseria gonorrhoeae*; TRNG=Tetracycline-resistant *Neisseria gonorrhoeae*; CLSI=Clinical and Laboratory Standards Institute; CDS=Calibrated dichotomous susceptibility; S=Susceptible; LS=Less susceptible; MS=Moderately susceptible; R=Resistant

Continuous monitoring of antibiotic resistance is important for choice of appropriate therapy. Most clinicians, however, are happy using empirical approach for management of STIs, especially in developing countries rather than an etiological-based therapy, which may be increasing the presence of antibiotic resistance. Hence, there is an urgent need to encourage clinicians for sending each specimen for culture sensitivity testing. An important factor that helped us in etiological diagnosis of gonorrhea was to have a dedicated staff for the transport and processing of specimens. Since it is a fastidious organism, any delay in processing can inhibit the growth of bacteria on culture. Furthermore, having an External Quality Assurance System (EQAS) and regular training workshops at the Apex center helped us to improve our microbiological techniques for laboratory processing.

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Conflicts of interest

There are no conflicts of interest.

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