cMLS and M Phenotypes among *Streptococcus pyogenes* Isolates in Chennai

Dear Editor,

Group A Streptococcus associated diseases continue to be a major public health problem. Asymptomatic carriage of GAS is prevalent in school children.[1] Penicillin remains the drug of choice for GAS infections; alternate therapies include macrolides and cephalosporins. Though resistance to penicillin has never been reported, resistance to macrolides and lincosamides is being increasingly reported in several parts of the world as in France, Italy, Slovenia and Pittsburgh.[2] Macrolide - lincosamide susceptibility phenotype patterns have been found to be associated with specific genotypes of erythromycin resistant strains. The M phenotype is associated with the *mef* gene that encodes a membrane protein responsible for efflux-mediated resistance and the MLS phenotypes are associated with the *erm* gene, which encodes methylases responsible for resistance.[3] The phenotypes can be identified by a simple double disc diffusion method. In this study we have identified the erythromycin resistant phenotypes present in school children in Chennai.

Two hundred and ten isolates of GAS collected from 1173 throat/ 86 pyoderma cultures of school children were tested for erythromycin resistance by Kirby Bauer disc diffusion test. Nineteen erythromycin resistant strains were phenotyped using the erythromycin - clindamycin double disc method. Briefly, Mueller-Hinton agar plates supplemented with 5 percent sheep blood were inoculated with the test strains. An erythromycin disc (15 μg) and a clindamycin disk (2 μg) (Hi Media) were placed 16 mm apart on the inoculated plate. The plates were incubated overnight in a 3 to 5% carbon dioxide incubator. The phenotypes were recorded by reading the zone of inhibition around the disc. Inducible macrolide-lincosamide-streptogramin phenotype (iMLS), is represented as resistance to erythromycin (≤15mm) with blunting of the clindamycin zone of inhibition proximal to the erythromycin disc. Resistance to both erythromycin and clindamycin (≤15mm) indicated constitutive macrolide-lincosamide-streptogramin (cMLS) phenotype; and susceptibility to clindamycin (≥19mm) with no blunting of the inhibition zone around clindamycin disc indicated M phenotype.

Of the 19 erythromycin resistant GAS strains obtained in this study, seven were from tonsillitis, four from pyoderma and eight were from carriers. Five out of 19 (26.31%) strains showed the cMLS and 14/19 (73.6%) strains showed M phenotype. The iMLS phenotype was not observed in our study.

Although there has been no confirmed report of decreased susceptibility to penicillin in GAS, resistance to macrolides has emerged in some countries. It is important to study macrolide resistance, as macrolides are relied upon in treatment of *S. pyogenes* infections in patients allergic to Penicillin. Rates of resistance have been reported as 10% in Sweden, 17% in Finland and 22% in UK.[4] Higher rates of resistance (>50%) have been reported in Taiwan and Japan and lower rates (2%) in Canada.[4] Erythromycin resistance has also been recorded in Turkey (3.8%)[5] and in Italy (38.3%).[2] In our study erythromycin resistance was only 9.04%. This was probably because our strains were all throat/skin isolates from school children and none of them were from invasive infections. Invasive strains are known to have a significantly higher rate of erythromycin resistance.

It is reported that more than 50% erythromycin-resistant isolates have M phenotype.[3] Our data is in agreement, as M phenotype accounted for the majority (73.6%) of our erythromycin resistant strains. Only 26.31% of our erythromycin resistant strains showed cMLS phenotype. Mechanisms of resistance are also known to be different depending on the geographical region. The M phenotype predominates in USA and Canada, whereas the MLS phenotype is more common in South Africa.[4] The reasons why a particular phenotype predominates in a specific geographical region is not known but this may be related to differences in the organization of medical care and antimicrobial prescribing practices.

Acknowledgements

The authors acknowledges the Council of Scientific and Industrial Research, India for the financial help provided to CSIR-JRF.

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Received : 26-04-05
Accepted : 20-12-05