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Emerging Resistance to Erythromycin and Penicillin in Streptococcus Pneumoniae In a Tertiary Care Hospital.

Naveen kumar*, Chitralkha Saikumar, and Lakshmi K.

Department of Microbiology, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.

ABSTRACT

The present study was done to detect antibiotic resistance pattern among Streptococcus pneumoniae. 250 sputum samples was taken from patients attending inpatient and outpatient in SreeBalaji Medical College and Hospital, and subjected to Gram staining, culture and sensitivity by Kirby Bauer disk diffusion. 50 sputum samples yielded growth of streptococcus pneumoniae. 23 isolates (46%) showed resistance to penicillin, 18 isolates (36%) showed resistance to Erythromycin, 13 isolates (26%) to Cotrimoxazole and 5 isolates (10%) to Ciprofloxacin. Resistance to 2 drugs, Erythromycin and Penicillin was found in 12 isolates(24%).

Keywords: Streptococcus pneumoniae, Erythromycin, penicillin, Resistance

**Corresponding author*

MATERIALS AND METHODS

The present study was done from September 2016 to February 2017 in a tertiary care teaching hospital, Sree Balaji Medical College, Chennai.

Collection of samples

250 sputum samples were collected from patient attending inpatient and outpatient department in SBMCH.

50 clinical isolates of *Streptococcus pneumoniae* was isolated. The organism was identified with Gram staining, culture on sheep blood agar, bile solubility and sensitivity to optochin.

Antibiotic susceptibility by disk diffusion method

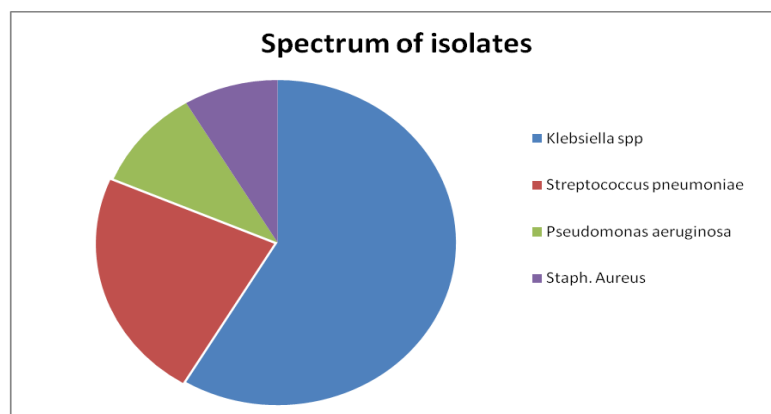
The antibiotic susceptibility was done by Kirby Bauer disk diffusion method on Sheep blood agar plate. Screening for Penicillin resistance was done by Oxacillin (1mcg) disc. Other antibiotics discs included were Tetracycline, Erythromycin, Ciprofloxacin and Cefotaxime. The zone of inhibition was measured and interpreted as per CLSI guidelines.

RESULTS

Out of 250 sputum samples, 50 sputum samples yielded growth of *Streptococcus pneumoniae*.

Of the 50 isolates, 23 isolates (46%) showed resistance to Penicillin, 18 isolates (36%) showed resistance to Erythromycin, 13 isolates (26%) showed resistance to Cotrimoxazole and 5 isolates (10%) showed resistance to Ciprofloxacin. Resistancetoa combination of 2 drugs namely Penicillin and Erythromycin was found in 12 isolates (24%).

The other pathogenic organisms isolated were *Klebsiella* species (60%), *Pseudomonas aeruginosa* (15%) and *Staphylococcus aureus* (5%)



DISCUSSION

The increase in resistance has placed a great emphasis on prompt and accurate recognition of resistant isolates of pneumococcus. Antimicrobial resistance in *S.pneumoniae* is not confined to hospital but also exists in community. Antimicrobial resistance pattern of these strains are largely unknown and recently the CLEN communitystudy group has undertaken analysis of these resistance pattern and trends. Though very few studies are available from India on *S.pneumoniae*, all have reported a high variable rate of colonization with a higher colonization rate among infants which gradually decreases with age. Oxacillin disc has been considered cost effective to screen isolates in area with very low Penicillin resistance rates despite its inability to distinguish intermediate resistant strains or strains that demonstrate borderline susceptibility. Extended

spectrum Cephalosporins have been successfully used for the treatment of strains intermediately sensitive or resistant to Penicillins. Although total resistance for penicillin is less in India compared to other Western countries, increase in the number of intermediate resistant strains in the present study is a matter of concern as it can result in greater spread of resistant strains in the near future. These strains can lead to higher rate of treatment failures thereby increasing the hospital stay. It is there by suggested that the inadvertent and injudicious use of antibiotics can be a cause for upcoming strains [1-5].

CONCLUSION

Drug resistant *Streptococcus pneumoniae* infections are becoming increasingly common throughout the world. India is no exception and in our study, we report a resistance rate of 46% to Penicillin, 36% to Erythromycin, 26% to Cotrimoxazole and 5% to Ciprofloxacin. The geographic distribution of pneumococcus resistant isolates to these antibiotic appears to be expanding. The molecular mechanism of Penicillin resistance are related to the structure and function of Penicillin binding proteins. The increasing resistance of *S.pneumoniae* to antimicrobial agents is a cause of concern. It is essential to determine the susceptibility of individual strains to Penicillin and Erthyromycin and other antimicrobial agents that could be used for therapy. Communication between clinician and laboratory is vital to determine the best therapeutic options.

REFERENCES

- [1] Essentials of Medical Microbiology, ApurbaSankarSastry, Sandhya Bhat K
- [2] Ravi kumar K.L, Vandan Ashok, Nasopharyngeal carriage, antibiogram and serotype distribution of *Streptococcus pneumoniae* in north india.
- [3] G.Jyothilakshmi and G.Shobhalatha-Resistance pattern and Antibiogram in *S.pneumoniae*.
- [4] Antibiotic resistance in *S.pneumoniae* in six Latin American Countires 1993-1999 surveillance. M.Hortal,M.Lovgren, F.De la Hoz, *Microbial Drug resistance* volume 7, November 4 ,2001.
- [5] Resistant Pneumococcal infections, Stephanie J.Schrag, Bernard Beall and Scott Dowell. World health Organization.