

In vitro activity of Cefazolin and Ampicillin

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Abstract:

An in vitro antimicrobial sensitivity of Cefazolin and Ampicillin towards 85 strains of Staphylococcus aureus and 52 strains of Esch. Coli was carried out by Kirby-Bauer's Technique at Microbiology Dept. Nepalgunj Medical College, Nepal. 47% Staphylococcus aureus and 25% Esch. coli. were found sensitive to Cefazolin where as sensitivity pattern of Ampicillin was 19% and 7.74% respectively.

Key words: Cefazolin, Ampicillin, Antimicrobial Sensitivity Test.

Cephalosporins are widely used and therapeutically important antibiotics. They inhibit bacterial cell wall synthesis in a manner similar to that of penicillin. The explosive growth of cephalosporins during the past decade has made a well accepted system of classification by "generation" based on general feature of antimicrobial activity. The first generation cephalosporins have good activity against gram positive bacteria and relatively modest activity against gram negative bacterial. It is claimed that fourth generation cephalosporins have an extended spectrum of activity compared to the previous generations and have increased stability from hydrolysis by plasmid and chromosomally mediated β Lactamases.

This study was undertaken to find out in vitro efficacy of Cefazolin (a first generation Cephalosporin) and Ampicillin towards two commonly encountered isolates Staphylococcus aureus and Esch. Coli. In present scenario to enable

one to make proper antibiotic policy for treatment of patients.

Material and methods

A total number of 85 stains of staphylococcus aureus and 52 strains of Esch. Coli were included in the study during January 2003 to August 2003 at Kohalpur Teaching Hospital, Kohalpur, Nepal from clinical samples like pus, wound, swab, throat swab, blood, CSF, urine etc. Antimicrobial sensitivity test (AST) was performed at Microbiology Dept, Nepalgunj Medical College, Chisapani, Banke, Nepal by Disc. Diffusion method using Kirby – Bauer technique on Muller Hinton agar. Muller Hinton agar, Cefazolin disc (30g) and Ampicillin disc (10g) were obtained from Hi Media Laboratory Pvt. Limited, (Mumbai, India). Interpretation was done as per NCCLS guideline. Staphylococcus aureus ATCC 25923 and Esch. Coli ATCC 25922 was used as sensitivity control.

Result

Table 1: shows the sensitivity of the isolates toward cefazolin and Ampicillin

Organism	Cefazolin	Ampicillin
Staphylococcus aureus (n=85)	40 (47%)	19 (22.35%)
Esch. coli (n=52)	13 (25%)	4 (7.74%)

Discussion

It is well known that antibiotics are to be stated after AST report. However, in various circumstances antibiotics are to be stated without such report. There are many reasons behind it. Sometimes delay of treatment may cause irreversible damage to the patient. Investigation cost may not be affordable also. Sometimes sample collection becomes difficult and

unjustified. Even culture report may remain as sterile/contaminated.

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In such cases, first generation cephalosporins or Ampicillin are usually used by clinicians. Additional advantage for Ampicillin is that it can be used safely during pregnancy and lactating period.

The present study shows cefazolin sensitivity towards staphylococcus aureus and Esch. Coli is 47% and 25% respectively. Chaudhuri A² in his recent report has shown Cefazolin resistance towards staph. aureus is 58.4%. The report partly corroborates with his findings. Sensitivity of Ampicillin towards same organisms is very poor. It is 22.35% sensitivity for staphylococcus aureus and 7.74% sensitivity for Esch. coli.

Conclusion

In absence of AST, use of 1st generation cephalosporins may be continued especially for gram positive bacterial infection. Cefazolin is preferred because of its longer half life (1.8 hrs)⁹. Antibiotic is to be changed if it shows resistance to subsequent AST report.

Some recent studies from India have highlighted the high level of resistance to newer cephalosporins^{7,8}. As such it is unjustified to abandon the use of 1st generation cephalosporins and to start treatment with newer cephalosporins. To start treatment with Ampicillin is better to be avoided because of its high resistance.

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