# A NTIMICROBIAL SUSCEPTIBILITY (AS) OF BACTERIA CAUSING COMPLICATED INTRA-ABDOMINAL ᆜ INFECTIONS (CIAI) O. Stetsiouk, D. Galkin, E. Ryabkova, O. Kretchikova, L. Stratchounski 🗆 Poster Nr. P 979 - Institute of Antimicrobial Chemotherapy, Smolensk State Medical Academy, Russia

### Abstract

— **Objective:** To study AS of the CIAI pathogens.

— Methods: AS testing of the aerobic CIAI pathogens was performed by Etests on Muller-Hinton II agar, of the anaerobes by broth microdilution. AS data were interpreted according to NCCLS (2001) recommendations and analyzed with WHONET software.

- **Results:** 135 strains (55 aerobes and 80 anaerobes) isolated from 18 patients with CIAI in Smolensk were evaluated. Predominant bacteria were gram-negative nonsporeforming anaerobes (NSA, N=50) – *Bacteroides* spp. (37), Prevotella spp. (8), Porphyromonas spp. (3), Dialister pneumosintes (2); Enterobacteriaceae (N=35) – E.coli (18), K.pneumoniae (6), Proteus spp. (5); Clostridium spp. (N=16); less common bacteria were Enterococcus spp. (13); nonfermenters (N=9): *P.aeruginosa* (5) and *Acinetobacter* spp. (3); *Eubacterium* spp. (N=5); *Peptostreptococcus* spp. (N=4). Most potent antimicrobials against *Enterobacteriaceae* were cefepime, imipenem and ertapenem (100% susceptible ceftazidime amikacin (97%), strains), and piperacillin/tazobactam, cefotaxime, ceftriaxone and ciprofloxacin (91%). High resistance was noted to ampicillin (71%) and gentamicin (43%). Most active against NSA were piperacillin/tazobactam, imipenem, ertapenem, metronidazole and chloramphenicol (98% susceptible strains), poor activity was noted for clindamycin (60% susceptible strains) and cefoxitine (68%). Similar susceptibility patterns were revealed in *Clostridium* spp. (imipenem, ertapenem and metronidazole – 100%, piperacillin/tazobactam and chloramphenicol – 88%, clindamycin – 62%, cefoxitine – 69%).

- Conclusion: From the microbiological point of view monotherapy with imipenem or ertapenem is appropriate for **CIAI.** Combination of piperacillin with tazobactam; cephalosporins III-IV or ciprofloxacin with metronidazole may be applied according to the *in vitro* AS data.

## Background

CIAI are potentially life-threatening polymicrobial infections associated with significant patient morbidity and mortality. Early diagnosis and appropriate management composed of timely surgical intervention along with antibiotic therapy and supportive care are crucial elements for the successful recovery of these category of patients. The standard approach to antimicrobial therapy of CIAI is an empirical selection of a broad spectrum antibiotic or drug combination with potent bactericidal activity covering the most common pathogens involved. Thence knowledge of etiology and AS of bacteria causing CIAI are paramount for the empirical choice of the most potent antimicrobial agents.

### **Objective of the study**

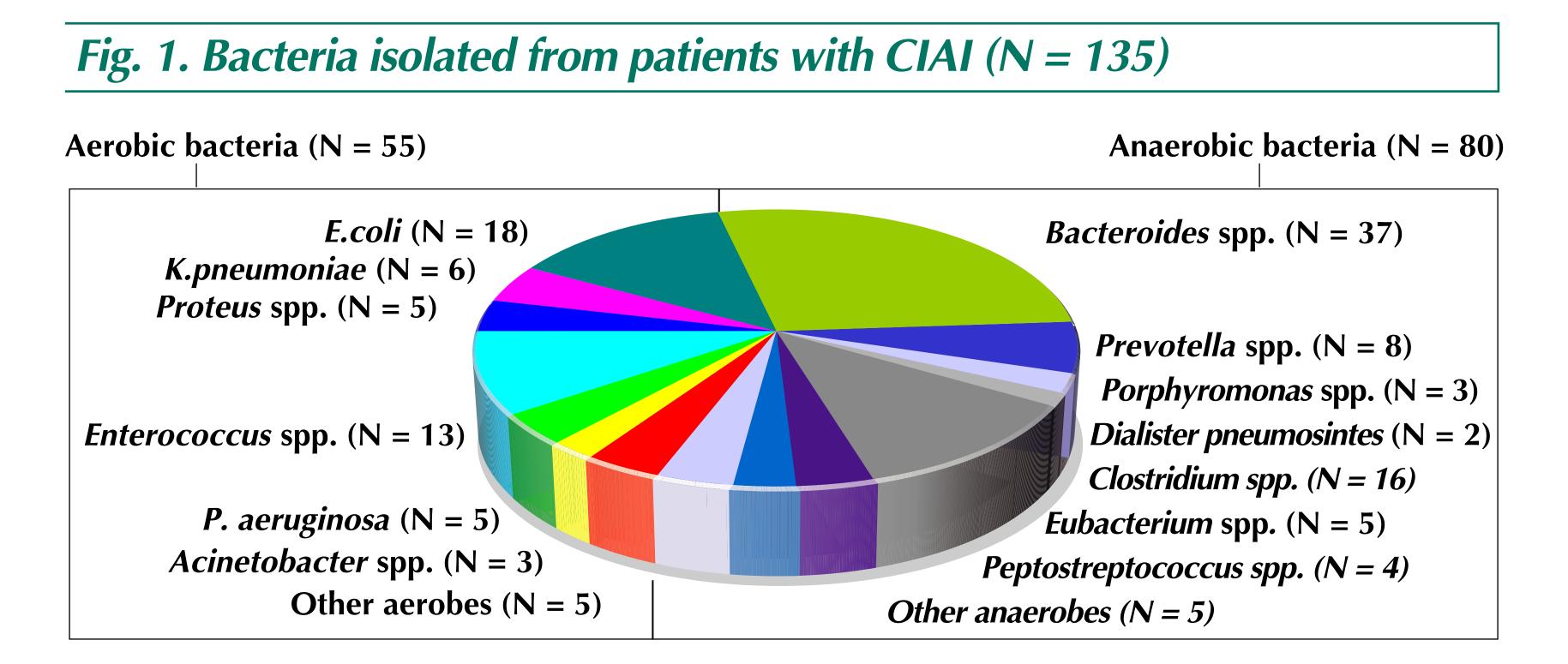
To evaluate the antimicrobial susceptibility of bacteria isolated from adult patients with CIAI hospitalized in surgical clinics in Smolensk, Russia, to the modern antimicrobial agents recommended for the treatment of CIAI.

#### Methods

Antimicrobial susceptibility testing (AST) of the aerobic gram-negative CIAI pathogens to Ampicillin (AMP), Amoxicillin/Clavulanate (AUG), Piperacillin (PIP), Piperacillin/Tazobactam (PTA), Cefuroxime (FRX), Cefotaxime (FTX), Cefriaxone (CRO), Ceftazidime (CAZ), Cefepime (FEP), Imipenem (IMP), Gentamicin (GEN), Amikacin (AMK), Ciprofloxacin (CIP) was performed by Etests and to Ertapenem (ERT) by disk diffusion method on Muller-Hinton II agar. AST of anaerobic bacteria was done by NCCLS broth microdilution to Ampicillin/Sulbactam (AMS), Ticarcillin/Clavulanate (TIM), PTA, Cefoxitin (FOX), CRO, IMP, ERT, CIP, Metronidazole (MTR), Chloramphenicol (CHL), Clindamycin (CLI). MICs interpretation was done according to the NCCLS (2001) recommendations. The AST results were analyzed with WHONET4 software.

### Results

A total of 135 strains (55 aerobes and 80 anaerobes) isolated from 18 patients with CIAI in Smolensk were evaluated (Fig. 1). Predominant bacteria were gram-negative non-sporeforming anaerobes (NSA, N=50) – Bacteroides spp. (37), Prevotella spp. (8), Porphyromonas spp. (3), Dialister pneumosintes (2); Enterobacteriaceae (N=35) – E.coli (18), K.pneumoniae (6), Proteus spp. (5); Clostridium spp. (N=16); less common bacteria were *Enterococcus* spp. (13); non-fermenters (N=9): *P.aeruginosa* (5) and Acinetobacter spp. (3); Eubacterium spp. (N=5); *Peptostreptococcus* spp. (N=4).



Most potent antimicrobials against Enterobacteriaceae were cefepime, imipenem and ertapenem (100% susceptible strains), ceftazidime and amikacin (97%), piperacillin/tazobactam, cefotaxime, ceftriaxone and ciprofloxacin (91%). High resistance was noted to ampicillin (71%) and gentamicin (43%) (Fig. 2).

Most active antibiotics against NSA were piperacillin/tazobactam, imipenem, ertapenem, metronidazole and chloramphenicol (98% susceptible strains), poor activity was noted for clindamycin (60% susceptible strains) and cefoxitine (68%) (Fig. 3).

Similar susceptibility patterns were revealed in *Clostidium* spp. (imipenem, ertapenem and metronidazole – 100%, piperacillin/tazobactam and chloramphenicol – 88%, clindamycin -62%, cefoxitine -69%).



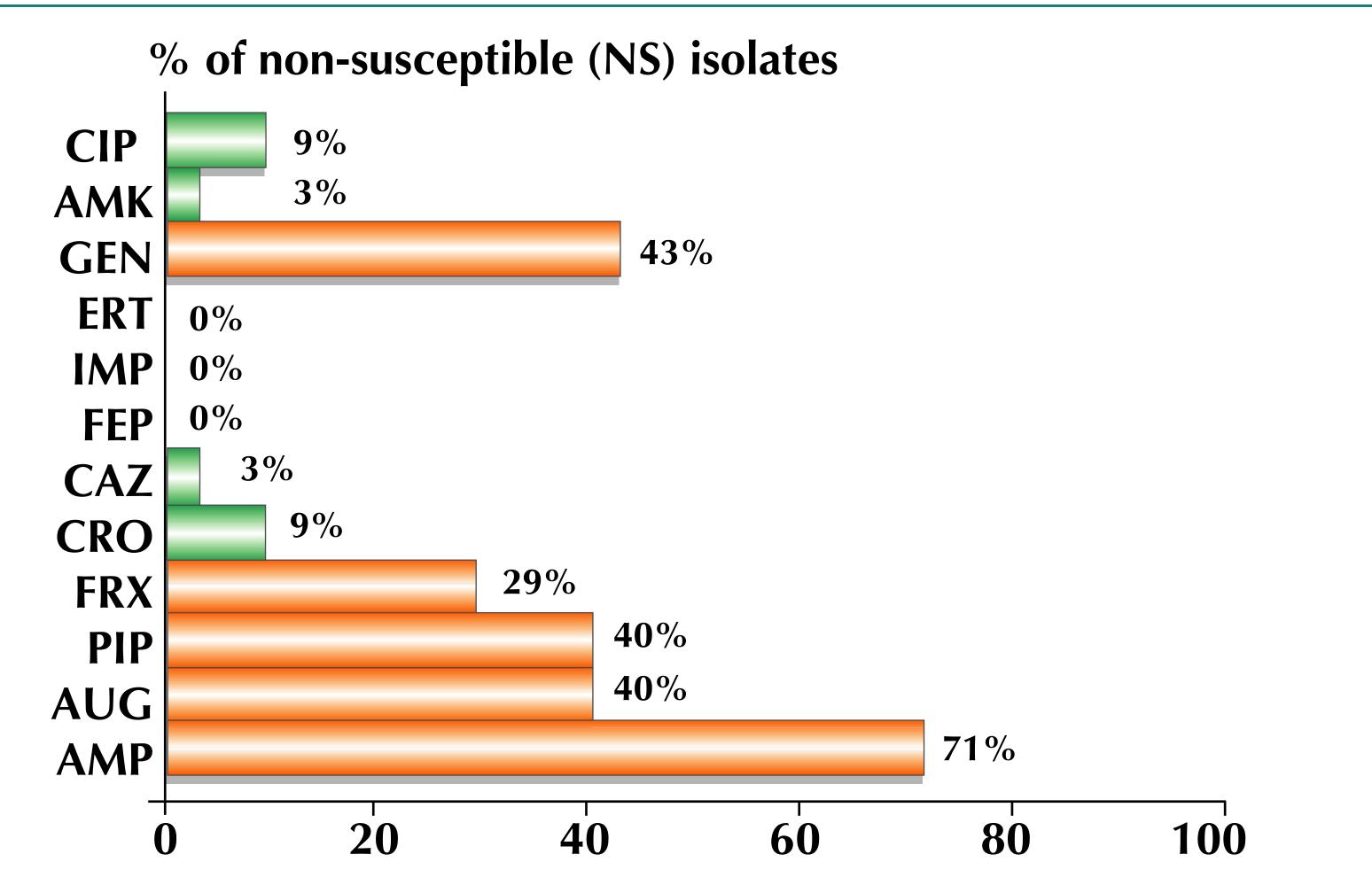
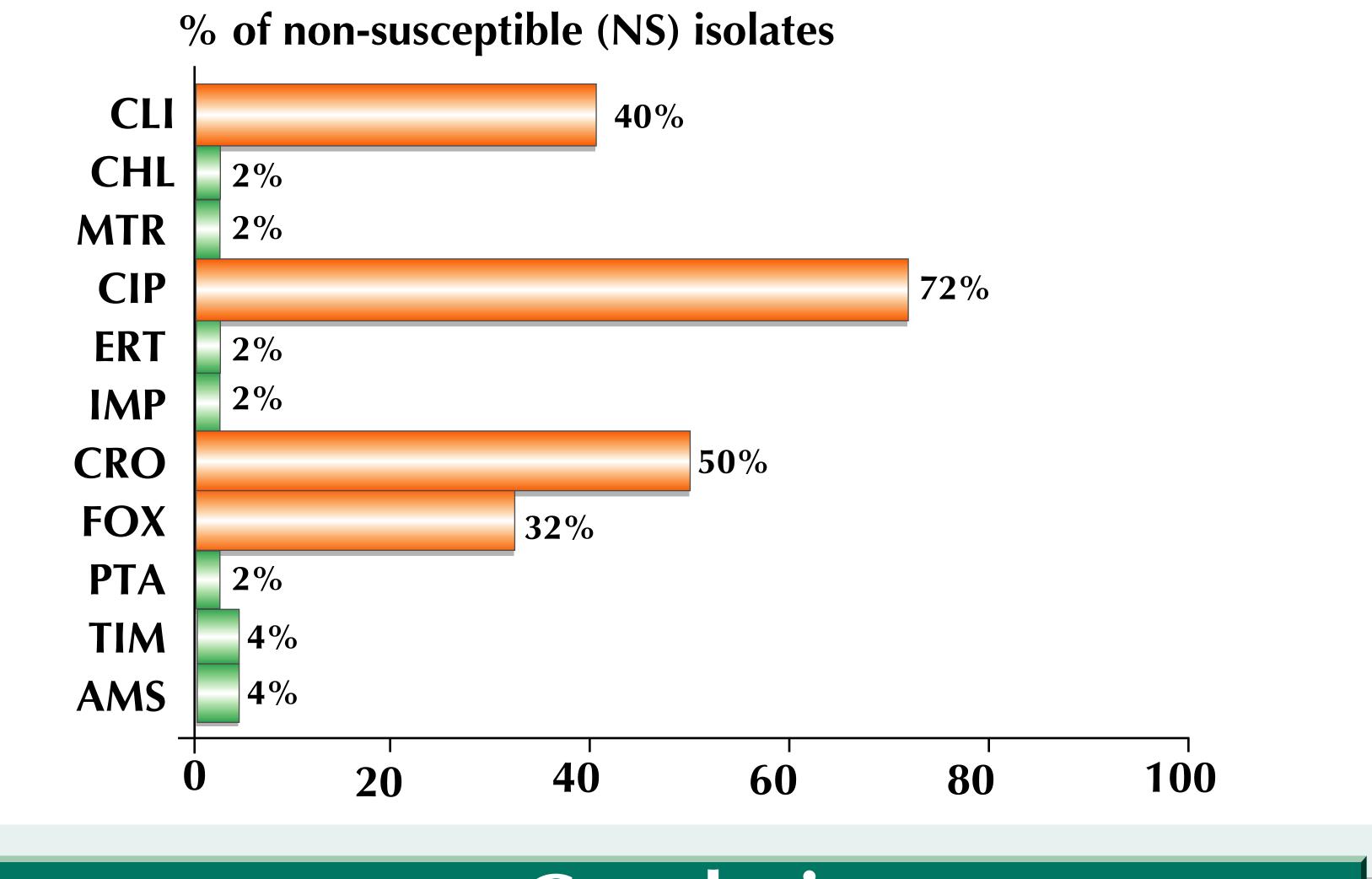


Figure 3. AST results of non-sporeforming anaerobes (N = 50)



### Conclusion

From the microbiological point of view monotherapy with imipenem or ertapenem is appropriate for CIAI. Combination of piperacillin with tazobactam; cephalosporins III-IV generations or ciprofloxacin with metronidazole may also be applied according to the in vitro AS data.