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Antibiotic Susceptibility of Salmonellosis Pathogens

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Objective

We tested local bacterial strains' resistance to antibiotics at both a broad selection and range of commercial preparations.

Introduction

It is increasingly critical to test antibiotics on local bacterial strains, due to the continuously growing resistance of microflora to extensively administered antibacterial medications. For this study, we examined the development of antimicrobial resistance of Salmonellae collected in Uzbekistan through 1998 versus those collected in 2008.

Methods

Comparative susceptibility screening of S. typhimurium and S. enteritidis Salmonellae to the antibiotics of the Cephalosporin line (Cefazolin, Cefotaxime, Ceftazidime and Ceftriaxone) and Ciprofloxacin was carried out in the Republic of Uzbekistan on strains collected through 1998 (34 strains), and after 2008 (24 strains). Antibiotic susceptibility of the stains was studied by the method of serial cultivations following the recommendations of the Clinical and Laboratory Standards Institute (CLSI, 2012) to determine a minimum inhibitory concentration (MIC) and calculate MIC90. The concentration range of the antibiotics was within 512 – 0.06 mcg/ml.

Results

The MIC values for 34 strains of S. typhimurium in 1998 were as follows: Cefazolin - 4.0 – 16.0 mcg/ml (MIC90-8.0 mcg/ml), Cefotaxime - 0.5 mcg/ml, Ceftazidime - 0.25 mcg/ml, Ceftriaxone - 0.06-2.0 mcg/ml (MIC90-1.0 mcg/ml), and Ciprofloxacin< 0.06 mcg/ml. The MIC values for 34 strains of S. typhimurium in 2008 for all administered Cephalosporins was within the range of 0.25 - >512 mcg/ml (MIC90-32.0 mcg/ml), and for Ciprofloxacin was – 0.5 – 1.0 mcg/ml (MIC90-1.0 mcg/ml).

The MIC values for 28 strains of S. enteritidis in 1998 were as follows: Cefazolin - 1.0 – 2.0 mcg/ml (MIC90-2.0 mcg/ml), Cefotaxime – 0.06-0.25 mcg/ml (MIC90-0.025 mcg/ml), Ceftazidime – 0.125 mcg/ml, Ceftriaxone – 0.06-2.0 mcg/ml (MIC90-1,0 mcg/ml), Ciprofloxacin - < 0.06mcg/ml. The MIC values for 24 strains of S. enteritidis in 2008 were as follows: Cefazolin - 2.0 – 8.0 mcg/ml (MIC90-4.0 mcg/ml), Cefotaxime – 1.0 – 2.0 mcg/ml (MIC90-2.0 mcg/ml), Ceftazidime – 0.25-128 mcg/ml (MIC90-32.0 mcg/ml), Ceftriaxone – 0.06-2.0 mcg/ml (MIC90-2.0 mcg/ml), Ciprofloxacin - < 0.06 mcg/ml.

Conclusions

Tests on local collections (through 1998) and newly cultivated (after 2008) strains of the pathogens circulating in the Republic of Uzbekistan demonstrated that the microbial population of Salmonellae underwent changes resulting in the occurrence of resistant strains. There are more moderately resistant and resistant strains among the newly cultivated strains as compared to the ones isolated through 1998.

Keywords

Antimicrobial resistance; Samonellae; Uzbekistan

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