

**TITLE:** RAPID ANTIMICROBIAL SUSCEPTIBILITY BY DISK DIFFUSION DIRECTLY FROM BLOOD CULTURE BOTTLES USING THE EUCAST "RAST" BREAKPOINTS: EVALUATION OF BRAZILIAN ISOLATES

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**ABSTRACT:**

The European Committee on Antimicrobial Susceptibility Testing (EUCAST) has proposed a rapid antimicrobial susceptibility test (RAST) using short incubation time directly from positive blood culture bottles for the most important antimicrobial agents for treatment of sepsis. The aim of this study was to evaluate the disk diffusion technique after 4 and 6h from positive blood culture bottles of *Enterobacterales* using the RAST breakpoints established by EUCAST. A total of 32 isolates of *Escherichia coli* and *Klebsiella* spp. were selected after the blood culture bottles flagged positive into BacT/Alert FA Plus. RAST and standard AST were performed according to EUCAST recommendations with the following antibiotic disks: amikacin (30µg), ciprofloxacin (5 µg), gentamicin (10 µg), meropenem (10 µg), and tobramycin (10 µg). The results were interpreted using the EUCAST RAST breakpoints for 4 and 6h readings and the EUCAST standard breakpoints for 18h AST readings. Results of categorical agreement (CA) were evaluated as well as the minor errors (mE), major errors (ME) and very major errors (VME). The Kappa (Ka) index was used to evaluate the correlation between the early and the standard readings (18h). The comparisons between 4h and 18h presented a categorical agreement (CA) equal to 90.6%, with mE, ME and VME of 6.9%, 1.9% and 0.6%, respectively. The comparisons of 6h and 18h presented a CA of 93.8% and a mE of 5%, but neither ME nor VME were observed. Moreover, there was a substantial correlation between the readings after 4h (Ka = 0.77) and an almost perfect correlation after 6h (Ka = 0.90) with the standard AST. Noteworthy, meropenem and Ciprofloxacin obtained unacceptable values on VME of 3.1% and mE of 18.7% for readings of 4 and 6h, respectively. These preliminary data indicate that the early readings, using the RAST breakpoints proposed by EUCAST, may be used in the clinical microbiology laboratory to anticipate the results of the antimicrobial susceptibility test of blood cultures. However, it is necessary to increase the number of isolates to obtain a more reliable data in order to establish a better conclusion of RAST.

**Keywords:** Blood culture; Disk Diffusion; Rapid antimicrobial susceptibility test

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