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Abstract (publication only)

**Added value of selective broth enrichment for the detection of rectal carriage of extended-spectrum beta-lactamase producing Enterobacteriaceae in hospitalised patients**

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Objectives: Adequate laboratory methods for the detection of extended-spectrum beta-lactamase producing Enterobacteriaceae (ESBL-E) are crucial in the prevention of nosocomial transmission of ESBL-E and appropriate antimicrobial therapy for ESBL-E infections. The use of broth enrichment in the laboratory detection of ESBL-E has been an unresolved issue. This study aimed to evaluate the added value of selective broth enrichment for the detection of rectal carriage of ESBL-E in hospitalised patients. Methods: In October 2011 an ESBL-E prevalence survey was performed in a Dutch teaching hospital. Rectal swabs were taken from all patients hospitalised on the day of the survey. Swabs were directly plated on a selective ESBL screening agar plate (EbSA, Cepheid), and subsequently placed in a selective tryptic soy broth, containing cefotaxime (0.25 mg/L) and vancomycin (8 mg/L) (TSB-VC). After 18-24 hours incubation (35-37^oC) the EbSA agar plate was read and the TSB-VC was subcultured on an EbSA agar plate that was read after 18-24 hours incubation (35-37^oC). Species identification and susceptibility testing was performed for all isolates that grew on either one of the EbSA agar plates using VITEK 2 (bioMérieux). For suspected isolates (MIC ceftazidime and/or MIC cefotaxime > 1 mg/L) the presence of ESBL was phenotypically confirmed with the combination disk diffusion method for cefotaxime, ceftazidime, and cefepime, both alone and with clavulanic acid (Rosco). Test results were considered positive if the inhibition zone around the disk was >= 5 mm increased for the combination with clavulanic acid. Results: Rectal swabs were obtained from 556 patients. ESBL-E was cultured in 38 (6.8%) patients. Direct EbSA culture detected ESBL-E in swabs from 22 (4.0%) patients. TSB-VC subculture increased the number of ESBL-E positive cultures to 37 (6.7%) (McNemar Chisquare=10.56, p=0.0012). Only one of 38 (2.6%) ESBL-E positive patients was not detected after TSB-VC enrichment. Escherichia coli was the predominant ESBL-positive species identified (26/38; 68%) Conclusions: The use of selective broth enrichment resulted in a substantial and statistically significant increase in the yield of ESBL-E screening in hospitalised patients. Broth enrichment is, therefore, considered indispensable for the reliable detection of ESBL-E.