COMMUNITY-ACQUIRED INFECTIONS DUE TO *Escherichia coli* HARBORING EXTENDED-SPECTRUM-ß-LACTAMASES (ESBL Ec)

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BACKGROUND:

The prevalence of ESBL Ec is increasing. In Spain, current prevalence rates range from 0, 06 to 2, 4% of all *E coli* isolates. ESBLs have been found most often in the hospital setting. However, ESBL Ec has been increasingly recognized in the community. The aim of this study was to determine the prevalence and risk factors for ESBL Ec UTI in the community and to investigate whether CTX-M types are present in this population

MATERIAL AND METHODS:

Adult cases and matched controls were identified through records of the Clinical Microbiology Laboratory in a 450 bed acute care teaching hospital with an area of influence of *circa* 300.000 inhabitants. Patients with CA infection for whom culture results were positive for ESBL Ec were eligible. Two different periods were studied: from Jan 2000 to Jan 2001, and from August to November 2003. Controls were matched in a 3:1 ratio for age, gender, date of isolation, site of infection and residence in long-term-care-facility. Potential risk factors recorded included: patient demographics, comorbidities, site of infection, antimicrobial therapy, bacterial infections in the past year, immunosupression, McCabe-Jackson score, urinary tract abnormalities, urinary tract manipulation, recent hospitalization and contact with the Health-Care-System. Isoelectric focusing was performed to identify the numbers and isoelectric points of the beta-lactamases. PCR was used to determine whether bla TEM, bla SHV, and bla CTX-M were present. Possible clonal relationships among the strains were determined by repetitive extragenic palindromic sequence PCR.

RESULTS:

In our area, the prevalence of infection of ESBL producing Ec increased from 0,47% in 2000 to 1.7% in 2003 ($p< 0,001$). CA infection shifted from 50% in the first period to 79.5% in 2003. Ninteen cases and 55 controls of CA–ESBL Ec UTI were included. No differences were found in terms of gender (79% were women in both groups), age [(61.8 (SD25) and 61.3(SD23), respectively] and lieu of residence (10% vs 7% were from a long term care facility). On univariate analysis genitourinary pathology ($p<0.039$), previous bacterial infection ($p<0.014$), IV treatment ($p=0.015$), hospitalization in the last 12 months ($p=0.046$) and previous exposure to 2nd generation cephalosporins ($p<0.001$) were associated with CA infection due to ESBL Ec. In our regression model, only previous exposure to 2nd generation cephalosporins was strongly associated with Ec harbouring ESBL(OR 18.25 CI 95% 1.92-175). In the first period, only TEM- and SHV-derived ESBLs were identified; In the second period 15 isolates produced 21 different beta-lactamases. The enzymes were characterized as members of the TEM group (57.1%), SHV group (14.2%) and CTX-M group (28.5%). No clonal relationship was found

CONCLUSIONS:

In the last three years there has been a marked increase in infections due to ESBL Ec, especially from the community. Only previous exposure to 2nd generation cephalosporins, (not to ciprofloxacin, 3rd generation cephalosporins or aminoglycosides) was predictive of an ESBL Ec C-A infection in our area. The emergence of CTX-M type of B-lactamase in *E. coli* follows closely the spread of ESBLs in community isolates.