Abstracts

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Dissemination of extended-spectrum beta-lactamase producers in natural environments in Northern Portugal
J. Rocha, H. Neto Ferreira (Porto, PT)

Objectives: The aim of this study was to detect ESBL producers, in natural water streams reaching the sea and compare with those isolated from sea water samples. Our previous work, showed contamination of marine coastal water with antimicrobial resistant bacteria, namely ESBL (extended-spectrum beta-lactamases) producers. This question alerted us to the origin of this contamination. In that way, it was our purpose to look for possible contamination sources, in water streams reaching the beach.

Methods: Natural water streams (probably including raining water streams) reaching the sea, were collected in July 2004 and 2005 (beach season, in Portugal), from 3 beaches of the Porto area. Isolates were selected by membrane filtration technique and the filters were placed on Mac Conkey agar and Mac Conkey agar with ceftazidime (2\(\mu\)g/ml) or cefotaxime (2\(\mu\)g/ml). Colonies of lactose fermenters were randomly selected and screened for ESBL production by the double disc synergy test. Identification of the selected strains was achieved by classic biochemical tools and ID 32 GN. Susceptibility to antimicrobial agents was determined according to the CLSI guidelines. Beta-lactamases were characterized by isoelectric focusing.

Results: The natural water streams accessed, in this work, seem to be impacted by faecal contamination of unknown origin, with antimicrobial resistant strains, namely ESBL producers. At least 4 water streams isolates, were able to transfer the ESBL gene, by conjugation.

Conclusion: Our tries to understand coastal sea water contamination with ESBL producers, showed that natural water streams reaching the seashore, are, in at least some part, responsible for seawater contamination with ESBL producers. Future work intends to find the origin of contamination of these natural environments. This situation seems relevant in terms of public health and environmental protection, once these are some of the beaches used by the Porto population. The incoming of ESBL producers to natural environments and the transferability of the ESBL genes by conjugation, might provide a track for environmental dissemination of resistant bacteria and genes, that may create a source of transferable traits for environmental bacteria, influencing natural reservoirs of resistance.

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Extended-spectrum beta-lactamase producing Enterobacteriaceae in Lebanese ICU patients: epidemiology and patterns of resistance
Z. Daoud, N. Hanna, R. Hajj, C. Moubareck, F. Doucet-Populaire, N. Hakimé (Beirut, LB; Paris, FR)

Introduction: The objective of this study is to assess the faecal carriage of ESBL producing bacteria in patients and health workers of intensive care unit of five Lebanese hospitals over a three-month period.

Methods: Faecal samples were collected in a period of 4 months from 378 patients that were admitted to the ICU in addition to 58 health workers of the same units. ESBL production was detected by double disk synergy as described by Jarlier et al. Then antibiotic susceptibility of ESBL-producing strains was determined by disk diffusion method and an enhancement of the zone of inhibition zone around ceftazidime, cefepime, aztreonam, and ceftotaxime towards the clavunate-containing disk indicated the presence of ESBL’s. Antibiotic susceptibility and MIC were determined by E-test.

Results: In total, 1442 faecal samples were collected during the whole study period from 278 ICU patients of the participating 5 hospitals. 118 strains isolated from 72 subjects were identified as ESBL-PS including 95 (80.5%) E. coli, 16 (13.6%) Klebsiella pneumoniae and 7 (5.6%) Enterobacter cloacae. The general characteristics of patients are represented in the table 1. Forty one new patients, for whom a conversion from negative carriage to positive carriage after admission was noted, in addition to 18 patients who were previously colonized (at admission) then recolonized at least 48 hours of ESBL producing strain eradication, were considered as acquisition cases (59 patients and 86 isolates). A higher rate of multiple carriages was detected among these acquisition cases (21 double carriages and 3 triple carriages of ESBL-PS).