Isolation of a Multi-drug resistant (Manual ESBL and Modified Hodge Test Negative) and KpC positive Salmonella Group E from a 5-year old male with Severe Combined Immunodeficiency (SCID) in a Private Tertiary Hospital in Davao City, Philippines.

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History: A 5-year old male was admitted last February 2013 for multiple infections secondary to Severe Combined Immunodeficiency. He was treated with different antibiotics for Mycobacterial, Fungal and Multiple opportunistic Bacterial Infections. Patient complained of gastrointestinal pain and mild diarrhea. The first request for stool culture was made on May 6, 2013 and the Microbiology Laboratory identified the organism by VITEK 2 compact (Biomeriux) as Salmonella Group. Polyvalent slide latex agglutination (Stift Germany) was used and typed it as Group E Salmonella. Sensitivity results were resistant to all Cephalosporins, Fluoroquinolones, and Aminopenicillins and Penicillins with beta lactamase inhibitor. Carbapenems were all sensitive and attending physician started Imipenem. After 15 days, the second culture was repeated. Salmonella group E was isolated with the same sensitivity pattern but this time gave an intermediate result on Ertapenem. The third stool culture was done after five days. Salmonella group E was isolated with same sensitivity pattern but carbapenems were all reported resistant. Manual ESBL and Modified Hodge tests were performed according to the CLSI and ESCMID guidelines. Both yielded negative. Sample was sent to Milan, Italy for Molecular Typing. Results showed that the organism was positive for the Carbapenemase class KpC. Patient was treated successfully with Colistin.

Conclusion: The investigators were able to isolate the first Salmonella non-typhi (Group E) that is highly resistant to Carbapenems, Cephalosporins & other anti-Salmonella drugs. Salmonella spp. is generally sensitive to a wide variety of antibiotics. ESCMID and CLSI recommend only a few antibiotics to be tested against Salmonella typhi and Salmonella non-typhi. Ampicillin, Co-trimoxazole, a fluorquinolone and a 3rd generation Cephalosporin antibiotics in cases of extra intestinal Salmonellosis must be reported in the sensitivity panel. This case reports the 1st strain of Salmonella non-typhi that is highly resistant to these anti-microbials and responded only to Colistin.

Keywords: Carbapenemase, ESBL and Modified Hodge Test

Isolation of clinical strains of Staphylococcus epidermidis from a Portuguese hospital and assessment of their relationship between biofilm formation capacity and antimicrobial resistance

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Staphylococcus epidermidis has been documented as an emergent pathogen responsible for many healthcare-associated infections (HAIs). These infections are an increasing cause of major concern not only due to the high distribution of methicillin resistance, but also due to their ability to form biofilm, which increases their persistence, impairs patient’s quality of life and leads to failed treatment and extra costs. Portugal has one of highest incidence rates of HAIs in Europe. However, bacteriological information that may shed light on the clinical significance of S. epidermidis Portuguese isolates and provide data for control as well as epidemiological measures is missing. In order to fill this gap, the aim of this study was to isolate and determine the antibiotic resistance profile of clinical strains of S. epidermidis and ensure its association with phenotypic and genotypic biofilm-associated determinants.

Of the 89 studied patients, 52 (58.4%) were men and the mean age was 45 years old. Bloodstream infections (69.7%) were the most frequently reported infections during the study period and almost a third of all infections were catheter-related. The majority (85.4%) of the clinical isolates were mecA-positive and among those, 92.1% were also resistant to 3 or more of the antimicrobial agent groups tested and hence considered multidrug-resistant (MDR). Resistance also reaches higher levels among β-lactam antibiotics (96.4%) and erythromycin (79.8%). Notwithstanding, positive associations were found between MDR and MRSE strains, between MDR strains and prescription of at least one antimicrobial agent and between patients under antibiotic therapeutic and MRSE strains. Regarding the phenotypic and molecular features, the majority (64%) of the clinical isolates were considered biofilm producers and all strong producers were carriers of the icaA gene, although equally distributed among MRSE and MSSE strains. The genetic combination most frequently observed was icaA-aap+bhp (41.6%) followed by icaA+aap+bhp (21.3%). Additionally, strains with the genetic combination icaA+aap+bhp were positively associated with both MRSE and MDR phenotype.

Our results confirmed the impact of S. epidermidis on hospital-acquired infections and highlight the burden of antimicrobial resistance, mainly multidrug resistance that reached alarming levels in this tertiary-care hospital. Moreover, this data raised concerns regarding antimicrobial strategies previously adopted. In addition, an association between the carriage of some virulent-associated genes and biofilm phenotype was clear, mainly regarding the carriage of icaA gene that demonstrated to be essential in the biofilm process of S. epidermidis clinical strains.

Keywords: Staphylococcus epidermidis; antibiotic resistance; phenotypic and clinical features.

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