

TITLE: MECHANISM OF RESISTANCE OF A *STAPHYLOCOCCUS CAPITIS* HIGHLY RESISTANT TO LINEZOLID.

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ABSTRACT:

Coagulase negative staphylococci (CoNS) are one the most prevalent microorganisms causing nosocomial blood stream infections. Linezolid (LZD) is the first member of an entirely new class of antibiotics and is highly effective for treatment of antibiotics resistant gram-positive bacteria, and is active in vitro against the majority of CoNS isolates but resistance to this drug has been described. Mutation in the rRNA or near at the drug binding site confers various level of resistance depending on the type and of the mutation, and the number of mutated *rrm* alleles. This study aims is to evaluate the mechanisms of resistance of a highly linezolid-resistant *Staphylococcus capitis* isolated from a bloodstream infection episode. The CoNS was recovered from a BACTEC[®] bottle in July 2014 from a patient hospitalized in the city of São Paulo, Brazil. Identification and susceptibility testings were performed by the VITEK 2 automated system and E-test[®] (AB BIODISK, ESTOCOLMO, SUÉCIA). Identification was confirmed by matrix-assisted laser desorption ionization time-of-flight (MALDI-ToF) mass spectroscopy (Bruker Daltonics, Germany), using the Biotyper 3.0 software (Bruker Daltonics, Germany). The mechanism of resistance to linezolid was searched by screening the *cfp* gene and mutations in 23S rRNA, ribosomal proteins L3, L4 and L22 by DNA sequencing (ABI sequencer, Applied Biosystems, USA). The CoNS isolate was identified as *Staphylococcus capitis*, the MIC by the VITEK 2 was ≥ 8 $\mu\text{g/mL}$ and by E-test was >256 $\mu\text{g/mL}$. The isolate was resistant to oxacillin and susceptible to vancomycin and teicoplanin. The gene *cfp* was not detected. The mutations G2576T, T2319C and T2119A were detected in the 23s rRNA. The mutations in ribosomal proteins L3, L4 and L22 were also detected. Multiple mechanisms appeared to be responsible for this highly linezolid resistance in CoNS isolate not possessing the *cfp* gene. These mutations could favor a selection of highly resistant mutant. To our knowledge is the first description of the mutation T2119A in the 23s rRNA.

Key-word: *S. capitis*, ribosomal mutations, resistance, linezolid.