ABSTRACT BOOK

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PM298 Comprehensive assessment of the ability of non-typhoidal Salmonella and Enterococcus faecium to survive acidic environments

Andreia Rebelo[1;2], Joana Vanessa Cordeiro Melro Mourão[1], Ana Raquel Freitas[1], Joana Campos[1], Luisa Maria Vieira Peixe[1], Patricia Antunes[1;3], Carla Novais[1]

[1]UCIBIO/REQUIMTE, Department of Biological Sciences, Microbiology Laboratory, Faculty of Pharmacy, University of Porto, Portugal
[2]School of Health, Polytechnic of Porto, Portugal
[3]Faculty of Nutrition and Food Science, University of Porto, Porto, Portugal

Background: Acidic-pH resulting from acid-products use or naturally occurring in different environments (e.g.food-production-chain-feed/disinfectants/human/animal hosts) potentially selects multidrug-resistant (MDR)-bacterial strains. Remains unknown if particular MDR-strains of pathogenic bacteria are more prone to overcome acid-stress.

Objectives: To assess susceptibility to acidic pH of non-typhoidal *Salmonella* and *Enterococcus faecium* with diverse epidemiological and genetic backgrounds.

Methods: We included 45 *E.faecium* (clades:A1-n=12/A2-n=18/B-n=6/not-identified-n=9/82%-MDR) and 56 *Salmonella* (*S.*4,[5],12:i:-n=17; *S.*Typhimurium-n=6; *S.*Enteritidis-n=3; 10 other serotypes-n=30/79%-MDR) from humans (healthy/clinical-n=39) and animal-production-setting/foods (n=62) (1997-2018/6-countries). The minimum-growth-pH (growth-pH_{min}) was assessed by broth-microdilution using Mueller-Hinton-II adjusted with HCl (pH=2.0-6.5/16h-20h±2h/37ºC) and the minimum-survival-pH (survival-pH_{min}) by plating microdilution wells without visible growth in Mueller-Hinton-II-agar (24h-48h±2h/37ºC). An Acid-Tolerance-Response-assay (ATR; HCl-shock-treatment-pH=3.0/15´-*Salmonella*/60'-*E.faecium*; or HCl-pre-adaptation-pH=4.5/60'+shock-treatment-pH=3.0/15´-*Salmonella*/60'-*E.faecium*) was performed in 3 isolates/each-genera (different growth/survival-$pH_{min,}$) followed by growth-pH_{min} and survival-pH_{min} assays.

Results: The growth-pH_{min} for most *Salmonella* was 4.0 (98%-n=55/56) and the survival-pH_{min}=3.5 (52%-n=29/56) or 4.0 (48%-n=27/56). For *E.faecium* the growth-pH_{min} was 4.5 (51%-n=23/45) or 5.0 (49%-n=22/45) and the survival-pH_{min} was 3.0 (18%-n=8/45), 3.5 (40%-n=18/45) or 4.0 (42%-n=19/45). The ATR-assay with pre-adaptation+shock-treatment enhanced survival-pH_{min} from 3 to 2.5 in *E.faecium* (n=1) and from 4 to 3.5 in *S.*4,[5],12:i:- (n=1). At survival-pH_{min}=3.5-4.0 isolates from different origins, serotypes-*Salmonella* or clades-*E.faecium* were detected. At survival-pH_{min}=3.0 only *E.faecium* (n=8/all-MDR; including the one with improved survival in ATR-assay), from a poultry-processing-plant using peracetic-acid as disinfectant, survived. Our data suggest that MDR *Salmonella* and *E.faecium* with diverse epidemiological and genetic backgrounds can survive to low-pH values found in diverse environments/hosts, although differences among clades/serotypes were not detected. ATR-assays revealed strain-specific ability to adapt to middle HCl-pH=4.5.