Distribution of Multidrug Resistant isolates of *Salmonella* 1,4,[5],12:i:- in Portugal, the new pandemic serovar

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In the mid-1990s it was reported in Europe the emergence of a pandemic monophasic variant of *Salmonella* Typhimurium, *S. enterica* subsp. *enterica* serovar 1,4,[5],12:i:-, presently considered one of the major serovars responsible for human salmonellosis worldwide. The incidence of antimicrobial resistant 1,4,[5],12:i:- strains has been escalating. The most frequent Multidrug Resistant (MDR) pattern, isolated from 30% of the human infection cases and from farming animals, is the ASSuT tetrarresistance pattern, showing co-resistance to ampicillin, streptomycin, sulphonamides and tetracyclines.

This study aimed to characterize the distribution of ASSuT MDR *Salmonella* 1,4,[5],12:i:- isolates in Portugal. The collection comprised 187 monophasic isolates obtained from 15 districts located in Portugal during a six years period (2006-2011) at the National Health Institute Doutor Ricardo Jorge. They were all previously serotyped and their identification was confirmed by multiplex PCR (mPCR) as recommended by the European Food Safety Authority¹. Each monophasic isolate confirmed by mPCR corresponds to a different clinical case, with the exception for three environmental isolates. They were evaluated for the presence of ASSuT profile using the disc diffusion method as recommended by the Clinical Laboratory Standards Institute guidelines, using the following antimicrobial compounds: ampicillin (AMP, 30 µg, Oxoid), streptomycin (S, 25µg, Oxoid), sulphamethoxazol (RL, 10 µg, Oxoid) and tetracyclin (TE, 30 µg, Oxoid).² The isolates’ MDR profile was confirmed by Minimal Inhibitory Concentration determination using E-test (BioMérieux) as recommended by WHO’s Global Salm-Surv.³

From the 187 serotyped isolates, 133 (71.1%) were confirmed by mPCR as monophasic strains. These isolates (n=133) revealed an ASSuT profile prevalence of 63.9% (n=85). MDR isolates distribution through Portugal, evaluated by district, showed that Porto has the higher percentage of cases (25%), followed by Setúbal (14%) and Aveiro (13%). It is important to refer that in the vast majority of the districts included in this study, more than half of the Salmonellosis cases evaluated were promoted by ASSuT isolates.

This study shows the high incidence of monophasic *S*. Typhimurium isolates in Portugal, which are widely distributed from north to south of the country. It is important to characterize the distribution of these highly pathogenic isolates to prevent their dissemination to non-problematic districts and adequate the regulatory measures to their true prevalence. Similar or higher percentages of ASSuT profile frequency have been detected in other European countries.⁴ The study also confirms the importance of combining traditional serotyping methods with PCR, since misidentifications could have significant public health consequences.

References

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