Serotype distribution and antimicrobial resistance of clinical Salmonella enterica isolated in Portugal between 2014 and 2017

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INTRODUCTION

Food-borne salmonellosis is an important public health concern worldwide.

The objective of this study was to characterize the epidemiological patterns and antimicrobial resistance profile of clinical Salmonella enterica isolates sent to the National Reference Laboratory for Gastrointestinal Infections of the National Institute of Health (INSa), between January 2014 and December 2017.

MATERIAL and METHODS

Serotyping

• 1142 clinical isolates
• Kauffmann-White-Le Minor scheme

Antimicrobial susceptibility

• 969 clinical isolates (2015-2017)
• Disk diffusion according to EUCAST guidelines

RESULTS

✓ 13.6% of the strains were received in 2014, 22.8% in 2015, 29.5% in 2016, and 34.1% in 2017.
✓ 75.4% were isolated in faeces, 10.1% in blood, 1.1% in faeces and blood, and 3.6% in other biological products; 9.8% isolates had no information.
✓ 16.3% (166/1014) of the Salmonella isolates were associated with invasive infections.
✓ Salmonellosis was more frequent in the 0-5 years age group (37.5%), and males (54.8%).

Salmonella serotype diversity

• Overall, 68 different serotypes were identified between 2014 and 2017.
• The most frequent serotypes were S.4,5:-i, -Enteritidis, S.Typhimurium, S.Rissen, S.Typhi, and S.Stanley (Fig. 1) and accounted for 87.2% of the isolates received.
• 12.8% cases (n=144) were associated to infection by uncommon serotypes (Fig. 1).
• There was a significantly increase of S. Enteritidis from 2014 to 2017 (15.7% in 2014 to 37.6% in 2017) and a reduction of S.4,5:-i (38.6% in 2014 to 26.6% in 2017) (Fig. 2).
• 88.6% (147/166) invasive infections were associated to non-typhoidal serotypes.
• All the 25 cases of S.Typhi were acquired in endemic zones.
• MLVA and NGS allowed the identification of several outbreaks of S. Enteritidis, particularly during 2016 and 2017.

CONCLUSIONS

• Although overall incidence rates of Salmonellosis did not change over time, trends and epidemiological factors differed remarkably by serotype. Indeed, there was a significantly increase of S. Enteritidis from 2014 to 2017 related to multi-country European outbreaks.
• Continued surveillance of antimicrobial susceptibility is important due to the risk of resistance, particularly to fluoroquinolones and third-generation cephalosporins, and the high-level of multiple antimicrobial resistance.
• A better understanding of Salmonella epidemiology will assist in responding to this disease and in planning and implementing prevention activities.