Rev. Inst. Med. trop. São Paulo
36 (1): 7-9, janeiro-fevereiro, 1994

SALMONELLA SEROVARS IN FOOD POISONING EPISODES RECORDED IN BRAZIL FROM 1982 TO 1991

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SUMMARY

The *Salmonella* serovars involved in 25 food poisoning episodes which occurred in the Southeast and South of Brazil from 1982 to 1991 were identified. The most frequently detected serotype was *S. Typhimurium* (13/25, 52%), and the food most frequently involved in the transmission of *Salmonella* was homemade mayonnaise.

The need to set up a permanent program of epidemiologic alert for food poisoning is emphasized.

KEYWORDS: *Salmonella*; Serovars; Food poisoning.

INTRODUCTION

Salmonellosis is a zoonosis representing a highly problematic threat to public health all over the world due to its high endemic prevalence and morbidity and especially to the difficulty in its control. Control of the disease is a challenge posed by the extraordinarily large number sources of infection, practically involving the entire phylogenetic tree of vertebrates [2, 15, 16].

Whereas in developed countries the incidence of human salmonellosis can be accurately determined, with the possibility of estimating the damage caused by the disease [7]. In Brazil even the bibliography available about the damage that *Salmonella* can cause to public health is still very scarce, with no possibility of any economic analysis. Perhaps this problem is mainly due to the fact that human infection with *Salmonella* occurs more commonly in a sporadic form rather than as an epidemic outbreak [1, 8, 10, 13]. This statement is based on the bibliography available in Brazil, which rarely mentions the processes resulting from the transmission of *Salmonella* through food, identified as food poisoning [12, 14, 15].

The objective of the present study is to report on the participation of *Salmonella* serovars in episodes characterized as food poisoning which occurred in some regions of Brazil from 1982 to 1991. Serologic typing was carried out on *Salmonella* strains isolated simultaneously from subjects with enteric signs and symptoms and from the food ingested by them.

BACTERIOLOGICAL ANALYSIS

Cultures were sent to the National Reference Center of Typhoid Fever, Department of Bacteriology, Oswaldo Cruz Institute (FIOCRUZ), by Central Public Health Laboratories of different states. It should be pointed out that the strains were only accompanied by data related to the suspected food and to the suspected presence of *Salmonella*, and had been isolated from one or more affected individuals with no data about the number of subjects exposed, their sex, age, predominant symptoms, mode of spread, and local circumstances.

The cultures sent by the laboratories (in nutrient agar or in another basic medium) were analyzed for purity by reisolation in plating medium (EMB-Difco),

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Table 1

Origin and source of *Salmonella* serovars in 25 episodes of food poisoning recorded from 1982 to 1991.

Year	Origin	Source	Serovar
1982	Rio de Janeiro/RJ	Roast beef	*Salmonella* sp. (9,12:-:-)*
1983	Curitiba/PR	Boiled fish	*S. Newport*
1984	Rio Grande/RS	Unknown **	*S. Emek*
1984	Curitiba/PR	Egg yolk/Mayonnaise	*S. Typhimurium*
1985	Macaé/RJ	Mayonnaise	*S. Emek*
1986	Mostardas/RS	Roast beef/roasted mutton	*S. Typhimurium*
1986	Santa Catarina	Meat for barbecue	*S. Enteritidis*
1986	Irati/PR	Mayonnaise	*S. Typhimurium*
1986	Rio de Janeiro/RJ	Mayonnaise	*S. Mbandaka*
1986	R. G. do Sul	Beef stew	*S. Anatum*
1988	Santa Catarina	Pork blood pudding	*S. Dublin*
1989	R. G. do Sul	Home-made sausage	*S. Agona*
1989	R. G. do Sul	Mayonnaise	*S. Typhimurium*
1989	R. G. do Sul	Mayonnaise	*S. Enteritidis*
1989	R. G. do Sul	Mayonnaise	*S. Typhimurim*
1989	Blumenau/SC	Mayonnaise	*S. Enteritidis*
1989	R. G. do Sul	Boiled chicken/Mayonnaise	*S. Typhimurium*
1989	Santa Catarina	Chick pea salad/Mayonnaise	*S. Typhimurium*
1989	Caxias/RS	Boiled rice/pasta	*S. Typhimurim*
1990	Tapes/RS	Duck egg	*S. Typhimurium*
1990	R. G. do Sul	Mayonnaise	*S. Infantis*
1990	R. G. do Sul	Barbecue meat	*S. Typhimurium*
1991	R. G. do Sul	Mayonnaise	*S. Typhimurium*
1991	Passo Fundo/RS	Roast meat	*S. Typhimurium*
1991	Petrolandia/SC	Mayonnaise	*S. Typhimurium*

* *Salmonella enterica* supsp. *enterica*: the biochemical profile was not compatible for the serovars *Typhi, Gallinarum/Pullorum.*

** Outbreak among the crew of a Navy warship during high sea training.

followed by determination of biochemical reactions and by specific agglutination with somatic and flagellar polyvalent and monovalent antisera [3]. Serovar representation was done according to the criteria of Le MINOR & POPOFF [11].

DISCUSSION

A number of factors may be considered in suggesting the mechanism of *Salmonella* transmission in the present study:

1 - The source was in the basic ingredients, e. g. the eggs.
2 - The food preparation was in advance of consumption and storage was at an inadequate temperature.
3 - Cooking was insufficient.
4 - Contamination was from the kitchen environment or utensils.
5 - The source of *Salmonella* was from the person(s) handling the food.

The first two suggestions are certainly applicable to home-made mayonnaise, which is a highly favourable medium for *Salmonella* growth [5]. Mayonnaise was in fact involved in 13 of the 25 cases studied in the present paper (52.0%). Contamination from the kitchen environment or from the person(s) handling the food are, however, recognized as the most likely modes of transmission in this country, although Brazilian literature on this subject is not abundant. In this respect it is notable that poultry carcasses are common sources of *Salmonella*: these are frequently prepared in the kitchen where they, or other contaminated material may serve as a source of infection for a variety of foods [4]. A survey to detect *Salmonella* carriers among food handlers in Belo Horizonte, Brazil, recorded 19.8% of them be excreting this organism, in particular the Typhimurium serovar [6].

As to the serovars involved, there was an effective participation of those classified as the most prevalent in the enteric processes caused by *Salmonella* in Brazil [1, 8, 10, 13, 15]. The Typhimurium serovar predominated in 13 cases (52.0%) and had been transmitted through mayonnaise in 8 of them. However, serotypes characterized as rare [9] may occur, such as *S. Emek*, which was conspicuously involved in large outbreaks detected among the crew of warship and in the city of Macaé, Rio de Janeiro state.

It should be pointed out that the confirmation of the link between the *Salmonella* isolated from the individual involved and the suspected food was always obtained in terms of a profile of *in vitro* susceptibility to antimicrobial agents in addition to the determination of the characteristics of the antigenic structures.

In summary, the problem is quite serious here in Brazil, especially considering the precarious quality of basic sanitarion faced by large part of the population and the lack of primary notions about personal and food handling hygiene. Despite this situation, food poisoning is seldom studied in our midst. Thus, we suggest that this process be analyzed routinely and on a permanent basis after the creation of a program of sanitary and epidemiologic alert at the national level.

RESUMO

Sorovares de *Salmonella* em episódios de toxinfecção alimentar occorridos no período de 1982 - 1991, no Brasil.

Em 25 episódios caracterizados como toxinfecção alimentar, ocorridos no período de 1982 a 1991 nas regiões sudeste e sul do país, foram identificados os sorovares de *Salmonella* envolvidos no processo. O sorotipo mais incidente foi *S. Typhimurium* presente em 13 oportunidades (52%), assim como dentre os alimentos responsabilizados na veiculação de *Salmonella*, a maionese caseira ocupou posição destacada.

Ressalta-se a necessidade de instituir a nível nacional um programa permanente de vigilância epidemiológica sobre o problema da toxinfecção alimentar.

ACKNOWLEDGMENTS

We are indebted to the Central Public Health Laboratories of the States of Rio de Janeiro, Paraná, Santa Catarina, and Rio Grande do Sul (Institute for Biological Research) for providing the strains and to Deise Paranhos, Junair Ribeiro, Sergio Alves de Azevedo and Evaldo Soares da Silva for technical help in laboratory and Vicente de Paulo Mello e Oliveira for secretarial assistance.

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Recebido para publicação em 14/06/1993.
Aceito para publicação em 23/11/1993.