

CASE REPORT

Salmonella enterica outbreak in healthcare professionals linked to a new year's party held in the Intensive Care Unit

Surto de salmonelose por *Salmonella enterica* em profissionais de saúde, causado por alimentos consumidos em uma festa de ano-novo realizada dentro da Unidade de Terapia Intensiva*

Viviane Cristina Caetano¹, Denise Alves Saltini², Jacyr Pasternak³

ABSTRACT

To describe a food-borne *Salmonella enterica* outbreak occurring in healthcare professionals after a potluck party that took place in the Intensive Care Unit of Hospital da Beneficência Portuguesa de São Paulo. Epidemiological inquiry of food consumption by the healthcare professionals involved anal swabs cultured in MacConkey agar, lactose negative colonies isolated and identified using the Microscan system, and the final identification performed in the Public Health Laboratory of São Paulo - Instituto Adolfo Lutz, by serology. No food that is not safely prepared by the hospital kitchen should be allowed inside the hospital.

Keywords: *Salmonella enterica*; Cross infection; Health personnel; Occupational risk; Disease outbreaks; Intensive care unit; Case report

RESUMO

Descrever um surto de infecção gastrointestinal por *Salmonella enterica*, que ocorreu no dia seguinte após uma festa de ano-novo, realizada dentro da Terapia Intensiva, onde cada um colaborou com um prato. Inquérito epidemiológico nesta festa, cultura de swab anal de oito funcionários que aceitaram fazer os exames em ágar MacConkey, isolamento das colônias lactose negativa e especificação no sistema Microscan, e definição sorológica das cepas isoladas no Laboratório de Saúde Pública de São Paulo, Instituto Adolfo Lutz. O surto é descrito e conclui-se que nenhuma comida que não seja preparada dentro do hospital por pessoal qualificado e em condições de segurança deve ser admitida para consumo dentro do mesmo, inclusive os alimentos consumidos pelos funcionários.

Descritores: *Salmonella enterica*; Infecção hospitalar; Pessoal de saúde; Riscos ocupacionais; Surtos de doenças; Unidade de terapia intensiva; Relato de caso

INTRODUCTION

Salmonellae are Enterobacteriaceae and live in the gastrointestinal tract of domestic and feral animals; the only exception is *Salmonella typhi*, which is an exclusive human pathogen. *Salmonella enterica* is one of the most common species with at least 2324 recognized serotypes⁽¹⁾. Humans acquire *Salmonella enterica* infection by eating contaminated animal products. The foods usually associated with *Salmonella enterica* outbreaks are eggs and poultry. Eggs can be contaminated in chicken cloaca or by transovarian infection. The risk is not associated with dirty eggs: apparently clean eggs can transmit *Salmonella* infection if eaten raw or undercooked. *Salmonella enterica* is also associated with poultry, especially when the meat is cooked and cooled down and eaten cold, or after reheating. In this setting low bacterial counts can increase exponentially in little time.

Signs and symptoms of *Salmonella enterica* infection appear 12 to 36 hours after ingestion of the contaminated food product. The most common symptom is diarrhea; some people may present nausea, vomiting, abdominal pain or headache, either each individually or all possible combinations. Sometimes the infection is perceived retrospectively, when patients with few or almost no symptoms develop arthritis two weeks later. The disease is almost always self-limited and no antibiotic therapy should be used in individuals with normal immune system⁽²⁾. Antibiotics do not shorten the bacterial excretion period. However *Salmonella enterica* infection can lead to serious

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¹ Registered nurse, Hospital Infection Control Committee, Hospital da Real Sociedade Portuguesa de Beneficência de São Paulo (SP).

² Registered nurse, Hospital Infection Control Committee, Hospital da Real Sociedade Portuguesa de Beneficência de São Paulo (SP).

³ Physician, Hospital Infection Control Committee, Hospital da Real Sociedade Portuguesa de Beneficência de São Paulo (SP).

Corresponding author: Jacyr Pasternak - R. Áustria, 141 - CEP 01447-010 - São Paulo (SP), Brazil. Fax: 37472-420 - e-mail jpaster@einstein.br

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complications and even death in frail nursing home residents; mortality associated with diarrhea is at least double in the elderly over 74 years as compared to younger patients⁽³⁾. A clinical study of non-typhoid *Salmonella* bacteremia carried out in Thailand showed that patients with a defect of the cellular immune function are at risk of developing the disease and have a rather high mortality rate: their overall mortality was 36.3%, rising to 60% in AIDS patients⁽⁴⁾.

Changes in food consumption and handling are reflected in the reported outbreaks of *Salmonella enterica* infections. The pattern of small outbreaks classically associated with food handled at home and eaten in small parties is being replaced by countrywide outbreaks associated with commercial food production and preparation. Some examples are the outbreak associated with ice cream consumption all over the US⁽⁵⁾, an outbreak linked to lettuce⁽⁶⁾ and another caused by chlorine-pretreated clover sprout seeds⁽⁷⁾. Investigations of multistate or even multicountry outbreaks are needed to define the offending foodstuff causing them⁽⁸⁻⁹⁾. This change has not yet been reflected in Brazil, where the old stereotype of *Salmonella* outbreak after the over 60's luncheon Christmas celebration still holds⁽¹⁰⁾. Hospital kitchens are managed by professionals and precautions are taken to prevent food-borne infections; however, there is no control at all regarding food brought into the hospital.

OBJECTIVE

To describe an unusual food-borne outbreak that affected exclusively healthcare professionals of the Hospital da Real Sociedade Portuguesa de Beneficência de São Paulo after a potluck party held in the Intensive Care Unit.

METHODS

Food enquiries were conducted by Hospital Infection Control nurses on all healthcare professionals present at the party. Fecal swabs were obtained from eight of them and cultured on MacConkey agar: lactose negative cultures were picked, re-isolated and finally identified using the Microscan system. All *Salmonella* ssp isolated were sent to the Public Health Laboratory of São Paulo - Instituto Adolfo Lutz, and serologically typed. All isolates were *Salmonella enterica* subspecies enterica 8,20:Z4Z23. No molecular studies were performed.

The Hospital Infection Control Committee checked all stool cultures of the patients for a month after the outbreak and reviewed all the charts of patients with diarrhea in the hospital for the same period of time.

OUTBREAK DESCRIPTION

The traditional New Year's lunch was held inside the Intensive Care Unit on January 4, 2004. The lunch table was set in an empty room of the Intensive Care Unit. The ICU is often full but, at this time of the year, there are less surgeries and admissions and this room was available. The other four rooms were active, with at least 13 patients being cared for. It was a potluck party and each employee brought some food. Very few forks were available, however, and fork use was communal. On the next day, January 5, the Hospital Infection Control Committee was notified of healthcare professionals that participated at this party and presented diarrhea. There were 21 healthcare professionals at the party including nurses, LPNs and two clerks, and 16 of them developed diarrhea. The attack rate was 76%.

RESULTS

Food consumption enquires showed that 15 individuals who fell ill ate rice, 10 broiled chicken, 8 mayonnaise, 7 pasta and 5 pancakes. The five participants who had no symptoms had not eaten chicken or mayonnaise. Two individuals who developed symptoms denied having eating chicken or mayonnaise but remembered using the communal forks; there were five forks for 21 party-goers and the forks were not cleaned between use.

No remaining foodstuffs were available for culture. Fecal swabs were obtained from 8 individuals and all were positive for *Salmonella enterica*, subspecies enterica 8,20:Z4Z23. The other healthcare professionals declined to have their swabs done.

Infection control measures: hand washing was emphasized and alcohol gel use after hand washing was mandatory in all healthcare professionals who fell ill when back to work. Surveillance of diarrheal diseases in the hospital was actively performed for a month, but no cases were reported in patients, or in other healthcare professionals outside the group of party-goers.

DISCUSSION

The probable foods associated with this outbreak are homemade mayonnaise using raw eggs and broiled chicken. The chicken was broiled at home, brought to the party and re-heated in an electric oven used to toast bread and left there a few minutes. Two individuals did not eat these foods but developed the disease (in one of them the anal swab culture confirmed infection by *Salmonella enterica*) and remembered using communal forks. In their cases either the fork

contaminated other foodstuffs or the inoculum was so high that bacteria present in food remained in the fork and led to disease. We were lucky to have no case of *Salmonella enterica* infection in inpatients at the hospital. Nosocomial outbreaks of *Salmonella* infections can be insidious⁽¹¹⁾ with long duration, low attack rates and might be missed in routine surveillance programs. Direct costs associated with nosocomial outbreaks of *Salmonella* infection can be high⁽¹²⁾; mortality, as previously mentioned, is high in immunocompromised patients. We have a duty to prevent *Salmonella* infections getting into the hospital and food that is not prepared in the hospital kitchen, with proper care and supervision, should not be allowed into the hospital. Christmas or New Year parties are good for morale, but should not be held in patient areas, particularly in the Intensive Care Unit. This recommendation was put forward by the Hospital Infection Control Committee to the hospital management.

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