Escherichia coli O145:NM ISOLATED FROM HEMOLYTIC UREMIC SYNDROME CASES. A DIFFUSE OUTBREAK

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INTRODUCTION: Most of the outbreaks and sporadic cases of HUS have been associated with STEC strains of serotype O157:H7/NM. However, other STEC serotypes, described as O26:H11, O103:H2, O111:NM, O113:H21 and O145:NM, were implicated as causing severe human disease (1, 2, 3), and were also detected in outbreaks.
Recently, diffuse outbreaks that involve communities, states and countries were observed. In Argentina, O145:NM is the second STEC serotype associated with severe disease after O157:H7.
In the last years, the Instituto Nacional de Epidemiología, a component of the Sentinel Unit of Mar del Plata city, has registered an increase of O145 STEC infections in the area.

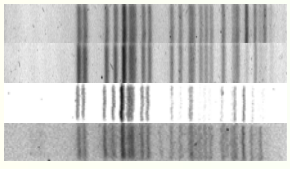
OBJETIVE:
The aim of this epidemiological study was to investigate HUS cases and contacts associated with STEC O145:NM infections.

MATERIALS AND METHODS:
Isolation: Fecal samples were plated on sorbitol MacConkey agar (Becton, Dickinson and Company, MD, USA) and incubated at 37 ºC for 18 h (4).
Screening: The confluent growth zone and presumptive colonies were screened by a multiplex PCR using specific oligonucleotides to *stx*1, *stx*2, and *rfb*O157 genes. (12)
Genotypic characterization: *eae* and *ehxA* genes were analyzed by PCR as described by Ganon et al. (5) and Schmidt et al. (6), respectively.
Subtyping: Pulsed-field gel electrophoresis (PFGE) using the *Xba*I enzyme with minor modifications, according to the protocol recommended by the Center for Disease Control and Prevention, Atlanta, GA, USA, for PulseNet and *stx* genotyping was performed (7).
Epidemiological investigation: Carried out according to methods of outbreak investigation (8).

RESULTS:
Epidemiologic investigation: Between January and February 2006, an *E. coli* O145:NM infection was identified in 3 HUS cases and one household contact, all of them residents of different neighbourhoods of Mar del Plata city. In the 3 cases, ages ranged from 7 months to 2 years, whereas the asymptomatic contact was 8 years old. The cases had an insidious beginning of the illness with bloody diarrhea, abdominal pain and vomiting. Fever was observed in two cases, without neurological condition. No deaths were registered.
The families had tap water inside the house, waste collection and disposal of liquid waste through sewer system.
The epidemiologic investigation revealed that the meal consumed by the affected families was prepared at home, and STEC exposure was likely due to lack of kitchen utensil hygiene after cutting raw meat. No other risk factors were identified.

STEC strains:
All STEC strains were characterized as *E. coli* O145:NM, *stx*2, *eae* and *ehx*A-positive, susceptible to the antimicrobials tested.
By PFGE, the strains yielded identical *Xba*I-PFGE (AREXSX01.0207) and *Bln*I-PFGE (AREXSA26.0018) patterns (Figure 1).

Figure 1. CLONAL RELATEDNESS OF STEC O145:NM STRAINS ISOLATED IN MAR DEL PLATA.
***Xba*I PFGE: ARENMX01.0061 (former AREXSX01.0207)**
***Bln*I PFGE: ARENMA26.0001 (former AREXSA26.0018)**
Cluster/Outbreak Code: 06MPENM.001c



Origin	Age	Gender	Date of reception at NRL
HUS	2- 5	MALE	2006-02-01
Contact	36	FEMALE	2006-02-01
HUS	0- 7	MALE	2006-03-31
HUS	1- 11	FEMALE	2006-03-31

CONCLUSIONS:
•STEC O145:NM strains belonging to the same cluster were associated to HUS cases in different areas of Mar del Plata city.
•No link among the cases was established. However they could be part of a diffuse outbreak.
•Home-made meals were probably involved. The main risk factor identified was the cross-contamination caused by inadequate hand and kitchen utensil hygiene after handling raw meat.
•This study highlights the importance of laboratory-based surveillance using a PFGE technique in real time as a warning mechanism that contributes to the early detection of clusters of sporadic HUS cases.

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