Outbreak of typhoid fever in a non-endemic area: comparison of three molecular typing methods

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Abstract

An outbreak of typhoid fever in Zurich, Switzerland, which involved seven customers and three employees of a city mall restaurant, was investigated by comparing three molecular typing methods: pulsed-field gel electrophoresis (PFGE), ribosomal RNA gene restriction patterns (ribotyping), and random amplified polymorphic DNA (RAPD). Both PFGE and ribotyping identified two molecular patterns among the outbreak-related isolates which differed in one band: these isolates were considered clonally related and differed clearly from other unrelated S. typhi strains. RAPD could not distinguish among outbreak isolates and control strains. © 1997 Elsevier Science B.V.

Keywords: Pulsed-field gel electrophoresis (PFGE); Random amplified polymorphic DNA (RAPD); Ribotyping; Salmonella typhi

1. Introduction

Typhoid fever still remains one of the primary health care problems in developing countries. Most cases observed in North America and Central Europe are associated with travel to places where Salmonella typhi is still endemic [1]. Outbreaks have become exceedingly rare in industrialized nations and often involve an asymptomatic carrier. Since the annual incidence of typhoid fever amounts to about 12.5 million cases worldwide (China excluded), the percentage of 1-4% becoming chronic enteric carriers – a considerably higher number than with other Salmonella serotypes – constitutes a consistent threat also for non-endemic regions, primarily by the increasing number of migrant workers [2]. However, we are not aware that in recent years there has been any infection with S. typhi in Switzerland in a patient without travel history, but we observed a small epidemic of typhoid fever in Zurich in April 1994. The epidemic was linked to a guest worker who had been employed for six months as a kitchen helper in a restaurant: the vehicle of the food-related outbreak had been most probably potato salad prepared by the carrier.

This small epidemic presented an ideal study object for the comparison of different typing meth-