

Rapid communications

IMPORTED FRESH SUGAR PEAS AS SUSPECTED SOURCE OF AN OUTBREAK OF *SHIGELLA SONNEI* IN DENMARK, APRIL – MAY 2009

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We report on an outbreak of *Shigella sonnei* infections involving ten cases notified through the laboratory surveillance system in Denmark in April and May. The likely source was consumption of fresh, raw sugar peas (sugar snaps) imported from Africa. This conclusion was based on interviews with cases and on the occurrence of a similar outbreak one month later in Norway. Fresh imported produce may occasionally be contaminated with pathogenic bacteria even when sold as ready-to-eat.

Introduction

On 27 May 2009 Norway sent an urgent inquiry through the European Food and Waterborne Diseases Network at the European Centre for Disease Prevention and Control (ECDC) reporting an increase in the number of *Shigella sonnei* cases. By 1 June Norway informed that they suspected the source to be sugar peas. As an increase in the number of *Shigella sonnei* cases was also observed in Denmark in April and May 2009, we initiated an outbreak investigation to find out if the Danish cases were related to the Norwegian outbreak.

Methods

All laboratory-confirmed *Shigella sonnei* cases since 1 April (Figure 1) were interviewed by telephone about date of onset,

symptoms, travel history, consumption of sugar peas and a small set of other exposure variables. Previous data on sugar peas consumption in the background population was reviewed. Isolates were subjected to typing by Pulsed Field Gel Electrophoresis (PFGE) using the enzyme XbaI. Sugar peas sold in three major groups of supermarket chains were traced back.

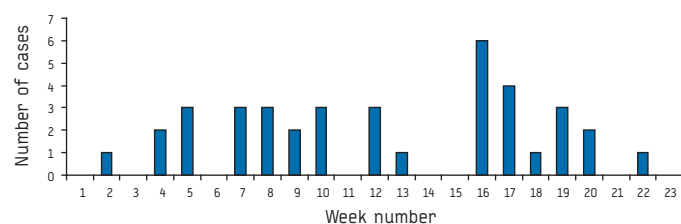
Results

In all, 17 cases of *Shigella sonnei* were reported from 1 April to 1 June 2009. Six cases were travel-related and one was linked to another known outbreak caused by fresh large shrimps from Bangladesh. Of the remaining ten cases, eight reported having eaten sugar peas prior to onset of symptoms. Of these eight cases all were female and their median age was 31 years (range 11-46 years). None had travelled abroad, except for short trips to Sweden before getting ill. The dates of onset of illness ranged from 7 April to 8 May. The two additional cases could be related to the outbreak as likely secondary cases as they were children of one of the cases who had eaten sugar peas. The two children fell ill three weeks after their mother.

A case-control study was not performed; instead, previous food-borne outbreak investigations were reviewed. Consumption of sugar

FIGURE 1

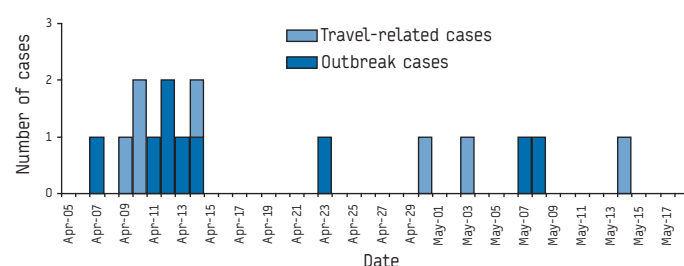
Number of laboratory-confirmed cases of *Shigella sonnei* in Denmark in 2009, by week of the sample arriving in the laboratory (n=38)



Note: The six cases in week 16 generated a signal (which appeared in week 19) in the automated outbreak algorithm which is run every week in Denmark.

FIGURE 2

Number of laboratory-confirmed cases of *Shigella sonnei* in Denmark, in April and May 2009, by date of disease onset (n=16*)



* One case (associated with the outbreak caused by consumption of sugar peas) could not state the date of onset of symptoms and is therefore not included

peas is among the questions included in several of the commonly used trawling questionnaires in Denmark. We looked into three different rounds of trawling questionnaire 'studies' performed among cases of a large outbreak of *Salmonella* Typhimurium U292 [1]. They were done in April, May and August 2008. In these studies 3/10, 2/17 and 0/15 cases reported consumption of sugar peas in a period of seven days prior to illness. This crude comparison indicated to us a significant association between *Shigella sonnei* infections and consumption of sugar peas (using the persons interviewed in April and May as community controls, comparing 8/8 exposed cases to 5/27 exposed controls, gives a Fisher p-value of < 0.0001).

Preliminary PFGE typing results of isolates from five of the 10 cases associated with sugar pea consumption suggest highly similar patterns. The PFGE patterns of the isolates from Danish patients resemble those obtained from the Norwegian patients but it is still too early to say if they are identical. Further typing results (which will include multilocus variable-number tandem-repeat analysis - MLVA typing) and comparisons between isolates from Denmark and Norway are pending.

The cases were generally able to recall in detail the type of product they had consumed and in which shop they had bought it. Six of the 10 cases associated with the outbreak reported buying sugar peas in supermarkets sharing in part the same distribution systems. Trace-back investigation of the sugar peas showed that they had been bought from a single whole-seller in the Netherlands and that they were of three different varieties which can be distinguished by their shapes, namely *sugar snaps*, *sugar peas (snow peas)* and *mange touts*. They originated predominantly from Kenya (from four different farms), but other batches sold in the same period came from Ethiopia and from Guatemala. The Dutch whole-seller was different from the one that supplied sugar peas to Norway. The two remaining cases may have bought their sugar peas in another group of supermarket chains which in part shares distribution systems with the supermarkets that sold the incriminated sugar peas in Norway. Further investigation into the origin of the sugar peas sold in this chain during April is still ongoing. There were no remains of the batch of sugar peas under suspicion and therefore microbiological analysis was not performed. Laboratory results from samples taken from later batches in two of the supermarket chains did not reveal contamination by either *Shigella* spp. or *Escherichia coli* (as indicator for faecal contamination).

Discussion

The investigation points at sugar peas as the source of this outbreak. The Danish and the Norwegian outbreaks do not appear to have been caused by the same type of peas, the batch of sugar snaps that was likely contaminated in Denmark was different from the one imported into Norway and also the Danish outbreak occurred one month earlier than the Norwegian outbreak. It is possible, though, that both outbreaks may have been a result of the same contamination event in Kenya; further investigations may cast light on this.

Outbreaks with a high ratio of females among cases may often point to fresh produce as the source. Only one previous outbreak in Denmark has been associated with sugar peas, an outbreak of *Shigella flexneri* in 2002 in which the epidemiological evidence pointed towards fresh imported sugar snaps of African origin (unpublished). Other fresh tropical vegetables which were eaten raw, have also caused outbreaks of shigellosis in Denmark, most

notable were two *Shigella sonnei* outbreaks in 2007 [2,3] and one in 1998 [4] both caused by baby corn imported from Thailand.

This outbreak underlines that some fresh vegetables imported into Europe from tropic destinations may pose a food safety hazard. In Denmark fresh imported sugar snaps are sold as a ready-to-eat product. Consumers should be aware that these types of products may pose a risk of microbiological contamination. The sugar snaps will remain crispy after being blanched or boiled shortly and it may be advisable for consumers to heat-treat fresh vegetables of this type before consumption.

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