

## Frozen raspberries and hepatitis A

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### SUMMARY

An outbreak of 24 cases of hepatitis A in Aberdeen was traced to a large hotel in the city by epidemiological investigation. Food-specific questioning of those affected, their fellow diners and hotel staff, coupled with serological studies, implicated raspberry mousse prepared from frozen raspberries as the source of the infection. The raspberries were probably contaminated at the time of picking.

### INTRODUCTION

The development of hepatitis A is known to be positively associated with the consumption of certain foods, particularly shellfish, by susceptible individuals (Ohara *et al.* 1983; O'Mahony *et al.* 1983). The epidemiological investigation of several outbreaks has suggested that frozen raspberries may similarly act as a vehicle for the transmission of hepatitis A (Noah, 1981). The following report describes an outbreak of hepatitis A which occurred in Aberdeen associated with the consumption of raspberry mousse.

### OUTBREAK

On the evening of 15 November 1983 a banquet was held for ten people at a large hotel in Aberdeen. There was a fixed menu which included raspberry mousse as dessert. Of those present eight consumed the mousse. Two bowls of mousse (approx. 20–30 individual portions) were made especially for the banquet. The ingredients were two 3 lb tubs of frozen raspberries, gelatine, sugar and pasteurized cream. Only half a bowl was consumed at the banquet and the remainder went to the staff canteen or was offered on the 'Chef's Special' lunch menu in the Coffee Shop the next day. Any mousse still remaining was piped into individual dishes which were then placed on the sweet trolley for the dining room that evening (16 November).

Six of the eight people who consumed the mousse at the banquet developed jaundice 24–38 days later (Fig. 1) and on testing were found to have deranged liver function tests and IgM anti-hepatitis A virus (HAV) antibody in their serum. The remaining two (both doctors) were asymptomatic, had normal liver function tests and were found to have IgG anti-hepatitis A virus antibodies indicating that they were immune.

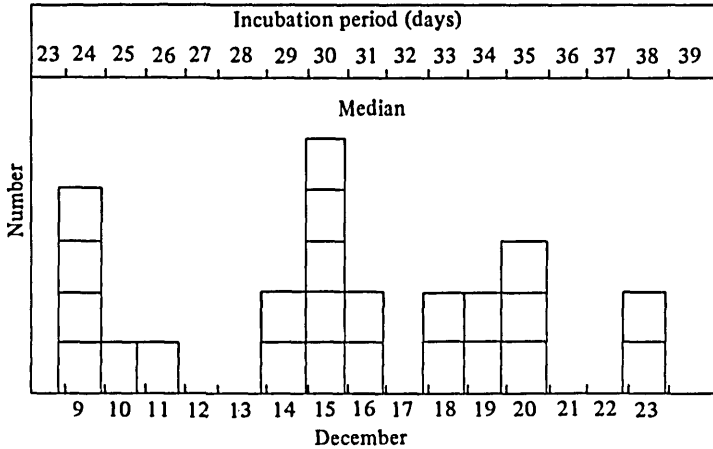


Fig. 1. Date of onset.

Fifteen members of the hotel staff became jaundiced, of whom only two denied having eaten mousse despite the fact that one of them was well known as a 'sampler' of foods. Those affected included the night manager who supervised the evening banquet and only tasted the mousse prior to serving. Five of the staff required hospitalization. The presenting symptoms were fever (70% of those ill), malaise (91%), nausea (96%), anorexia (87%), 'flu-like' symptoms (75%), diarrhoea (38%) and abdominal pains (15%). Three hotel guests became ill and on subsequent enquiry confirmed they had had the mousse. All the above group had abnormal LFT's and IgM anti-HAV antibodies. Ninety percent of those who were ill became jaundiced. Three food handlers on the hotel staff claimed to have eaten the mousse with no ill effects. They all had IgG anti-HAV antibodies. Blood samples were also obtained from all food handlers and servers (65) in the hotel. With the exception of those who were ill and gave a history of eating the raspberry mousse none of this group had IgM anti-HAV indicating that the source of the outbreak was unlikely to be a member of staff. The illness records for the hotel staff during the previous 2 months were scrutinized and the blood of any member of staff who had been off work during the period was checked for IgM anti-HAV. No positives were found.

Nine secondary cases were identified including four members of the public who dined at the hotel on 15 or 21 December when the outbreak was at its height, one member of staff – a waitress in the restaurant and four close family contacts of primary cases.

The supplier of the raspberries was identified by reference to the hotel's stock-control records. They were purchased frozen from a wholesaler who was in turn supplied by a distributor who blast-froze raspberries gathered from a number of farms, smallholdings and large private gardens. Three of these producers had been indirectly implicated in a previous outbreak (Noah, 1981).

The 4–5 cwt of raspberries collected each day were placed in (3 lb) white plastic tubs with close-fitting lids, taken to the cold room without delay, frozen, placed in numbered cartons and kept till required. The fruit was not handled after it left

the producer apart from random checks for quality. Orders were delivered in a refrigerated vehicle.

Raspberries from the same batch as supplied to the hotel were no longer available for testing by the time investigation of the outbreak occurred. A sample from the same supplier was tested and gave the following result – total plate count per gram at 37 °C: 220; all types of *Escherichia coli* per gram at 37 °C: nil; faecal coli per gram at 44 °C: nil.

It is presumed that contamination occurred either at the time of picking and/or packing the raspberries, probably by a virus excretor amongst the pickers. Cases of hepatitis A infection were being reported from the area at the time the fruit was being picked (Dr Ramsay Small, personal communication).

In preparing the mousse the chef used the entire contents of one tub and part of the second. The remaining defrosted raspberries were consumed by another chef who did not become ill and when tested was found to lack both IgM and IgG antibodies to hepatitis A virus suggesting that only one of the two tubs supplied to the hotel was contaminated.

The outbreak was controlled by a policy of exclusion of affected staff from work and counselling all members of staff, particularly food handlers, on the importance of scrupulous hand washing. Immunoglobulin prophylaxis was not advocated.

#### DISCUSSION

This outbreak illustrates the potential of raspberries as a vehicle for transmission of hepatitis A. Contamination of the berries probably occurred at the picking stage or when the plastic tubs were being filled and their weight adjusted prior to freezing. Once contaminated, raspberries are particularly liable to transmit hepatitis A virus because in contrast to strawberries they are not as a rule washed prior to serving. The virus is not affected by the freezing process and can emerge months or even years later to infect a susceptible host.

Berry-picking is a seasonal occupation which attracts large numbers of itinerant workers and their families. Caravan sites become crowded at peak times and cases of hepatitis A often occur in such communities as occurred during the summer of this outbreak. To prevent further outbreaks there is a need to ensure that sufficient 'official' camping sites with adequate toilet facilities are provided in the areas concerned and most importantly on the fruit farms themselves. Pickers should be warned of the possible implications of deficiencies in personal hygiene and supervised as far as possible to ensure that no gross misconduct occurs.

When an outbreak is reported and a large establishment such as an hotel is implicated the full co-operation of the management and staff is essential if the source of the infection is to be traced and the number of secondary cases kept to a minimum. In this outbreak the investigation was greatly facilitated by the co-operation received from all members of the hotel staff and from the information gleaned from computerized records. The rapid identification of food handlers and the testing of their serum samples for IgM and IgG antibodies to hepatitis A virus enabled us to identify those who had had a recent hepatitis A infection. By relating this information to food-specific questioning we were able to implicate the raspberry mousse and to exclude the possibility that a staff carrier was responsible.

Raspberries like shellfish should be included in the food specific questioning of any sporadic cases of hepatitis A.

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