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HOTEL DISINFECTION USING AEROS® FOLLOWING NORWARK VIRUS INFECTION

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(In conjunction with Argyll & Clyde NHS Board)

Investigation into an Outbreak of Norovirus Infection at *****[1] Hotel, Gourock. August 2003

Summary

An outbreak of gastroenteritis, confirmed as norovirus, and affecting 41 people who were guests or staff at a hotel in Inverclyde. Control measures included movement and work restrictions, environmental cleaning and the use of a novel fogging agent. The last known case occurred 8 days after the onset date.

1.0 Introduction

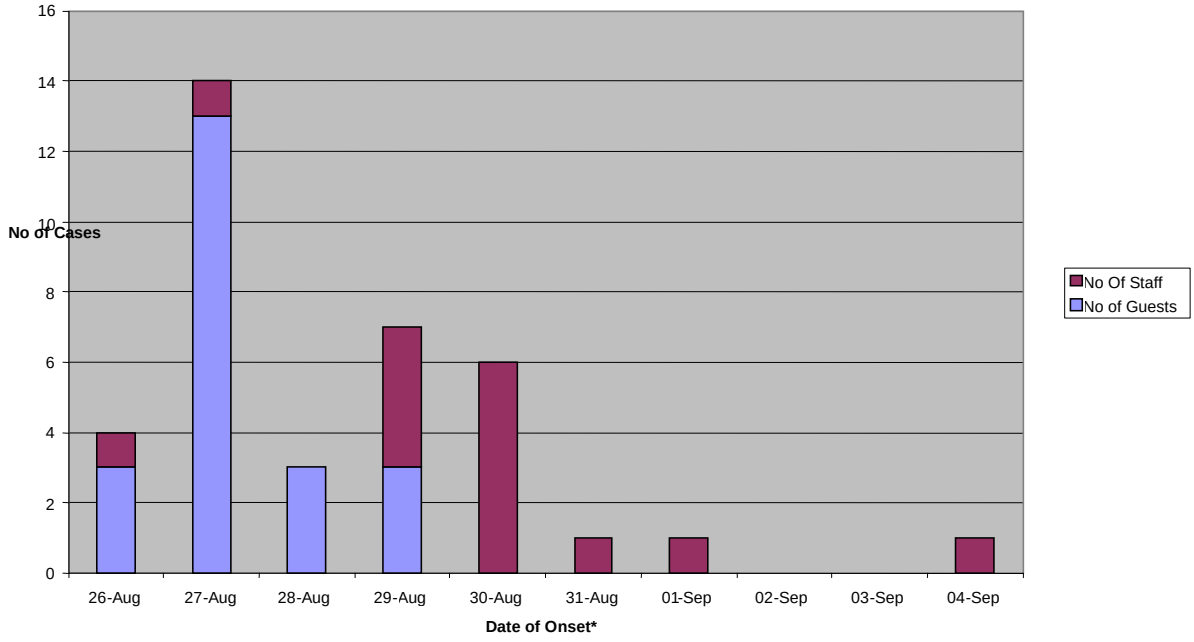
1.1 On Wednesday 27th August 2003 the manager of the *****[1] Hotel reported a possible outbreak of vomiting and diarrhoea to Inverclyde Council Environmental Services. At the time he knew of 10 residents who had reported vomiting and/or diarrhoea between 10.30 p.m. the previous evening and 5 a.m. that morning. The restaurant supervisor had also phoned in with symptoms. The restaurant supervisor's 3 children also had symptoms. Additionally one of the resident cases reported working in a nursing home where there had been an outbreak the previous week.

[1] Due to privacy reasons the name of the hotel has been removed, but is known to the manufacturer.

2.0 Investigation of the outbreak

2.1 After discussion with the NHS Board's Consultant in Public Health Medicine (CPHM) an Environmental Health Officer visited the hotel on the 27th August and spoke to the manager. An "illness log" was set up at the hotel for both staff and guests. The epidemic curve of reported cases is shown in Figure 1 (n=37).

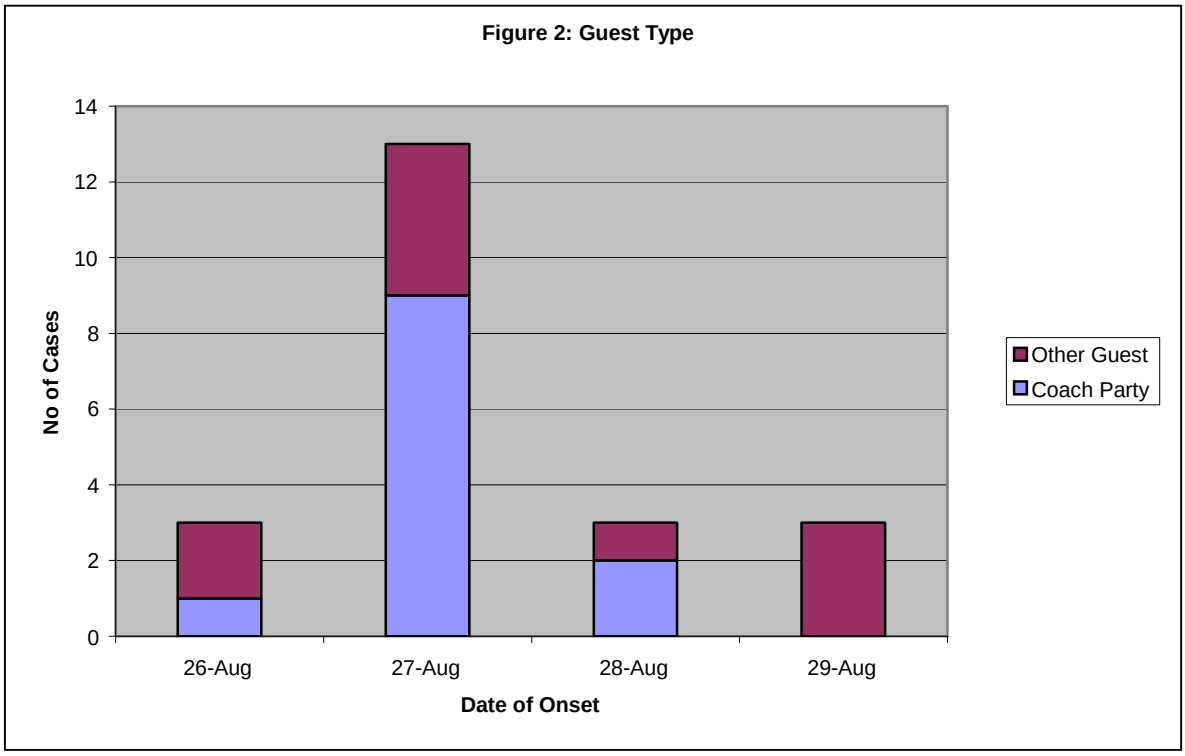
Figure1: Outbreak of Gastroenteritis at ***[1](August -September 2003)**



*A further 4 cases (2 guests and 2 staff) were identified but onset dates were not obtained. In the case of the 2 guests however the onset dates were prior to 30- Aug.

2.2 A G.P. had been called by the hotel and interviewed and distributed specimen kits to those affected. From interviews with the hotel management it was soon established that:

- Main symptoms were diarrhoea and/or vomiting with the majority of cases having both.
- Symptom duration was short; some of the first cases were already recovering.
- Although most cases had eaten in the restaurant this was not universal.
- Amongst those who had eaten in the hotel there was no common pattern in foods consumed.
- The majority of early cases were from members of a coach tour based in the hotel. (Breakdown at Figure 2.)
- No symptoms had been reported by catering staff.
- The hotel was on the main public water supply. Recent samples had been satisfactory.



2.3 The working hypothesis was that this was a viral infection of the Norovirus type although this was kept under review throughout. The case definition was a guest or member of staff at the hotel who developed diarrhoea or vomiting on or after 26th August.

2.4 The final tally of known cases totalled 41. Although other cases may have occurred the hotel distributed advice to all guests and staff, including incoming guests and those organising functions over the weekend of 29 – 31 August so it would be reasonable to assume that the vast majority of cases would have been reported.

2.5 Regular contact with the hotel management and between Environmental Health and duty CsPHM established that satisfactory control measures were implemented and adhered to. It was not therefore considered necessary to establish an Outbreak Control Team.

2.6 The SCIEH document "Norovirus Infection – Guide for NHS Boards and Local Authorities" was used as a guide. As well as being a useful information source it provided templates for information for guests and staff. The hotel manager also adapted the Outbreak Monitoring Form into an excel spreadsheet to track cases.

3.0 Microbiological Results

3.1 Of the dozen or so specimen kits distributed to early cases only 3 from guests were returned for analysis. This may have been connected to the short duration of the illness (most recovered within 48 hours of onset). No bacterial pathogens were isolated from those submitted for analysis. As the outbreak continued it was decided that there was little value in distributing further kits following discussion with the laboratory. Specimens were submitted by affected staff via their own G.P.s however. Six specimens returned positive results for Norovirus by polymerase chain reaction, one from a guest and five from staff.

4.0 Control Measures

4.1 Control measures included:

- Any staff reporting symptoms excluded for a minimum of 48 hours post symptoms.
- Guests reporting symptoms were advised to remain in their rooms until symptoms had passed.
- Enhanced cleaning regimes were introduced for all public areas.
- Arrangements were made for fogging all affected rooms on Friday 29th August.

4.2 The coach party were going on daily outings from the hotel up until Friday 29th August. In spite of affected guests remaining in their rooms this was obviously a group with potentially high exposure. This was highlighted by at least one member of the party falling ill on the coach on Thursday 28th.
In order to minimise the risk the coach was fogged on the evening of 28th August and advice was given on increasing the number of stops en route to the South East of England on the Friday. As a further precaution advice was given on fogging the coach again on its return to England and this was discussed with the relevant local authority. No data was obtained on any further cases in the coach party following its departure on the 29th.
Two members of the party remained at the hotel on 29th as they were considered unfit to travel.

4.3 All affected guests were advised against travelling on to other hotels. In spite of this a family of four, one of whom had had symptoms but recovered, travelled to another hotel in the group. The hotel was alerted and when the other three family members suffered symptoms they were advised to remain in their room. The local authority was informed. No further cases were reported.

4.4 A number of large groups were booked into the hotel on 29th and 30th August. All of these groups were given information about the outbreak. Two were relocated to other hotels in the chain, partially due to anticipated staffing problems in the hotel. Two large wedding receptions did go ahead however on 29th and 30th.

One of the groups relocated was a pipe band attending the Cowal Gathering. The possible implications of a large group of potentially infectious people attending the event were discussed with the CPHM and Argyll and Bute Council. Although it had been concluded that the public health implications were minimal, the hotel removed any risk by offering alternative accommodation.

4.5 A press release was prepared in case of press interest in the outbreak. This did not transpire but it is useful to have such a document prepared at an early stage.

4.6 Fogging was carried out in all of the rooms affected as well as all public areas except the reception on the morning of 29th August. Fogging was with silver catalysed hydrogen peroxide. This had not been previously used outside a laboratory environment where it had been shown to be effective against calcivirus. The potential advantages of this were the non-hazardous nature of the chemical and the very short contact time required in laboratory trials. In effect the only delay following fogging was to allow soft furnishings to completely dry.

Although there is no way of measuring the effectiveness of the procedure in a quantative manner, no cases occurred in guests in the hotel after 29th. This includes both those attending the weddings and guests occupying rooms which had required fogging, in spite of all incoming guests being informed of the problem. Of the 22 rooms fogged 2 were re-let the same day and 1 the day after. The rest of the rooms were re-let over the subsequent week. Again although this is not conclusive it would appear to provide circumstantial evidence of the efficacy of the technique given the absence of further reported cases in guests.

5.0 Conclusion

5.1 Epidemiological and clinical evidence pointed to this being an outbreak of Norovirus, this was confirmed by virology. The specimens submitted for microbiological analysis were negative for bacterial pathogens and six specimens were positive for Norovirus. The outbreak subsided in 8 days.

6.0 Recommendations and Lessons Learned

6.1 Prompt action by the hotel management was essential in this instance in controlling the outbreak. Had there been any hesitation on the part of the hotel in reporting their suspicions of an outbreak, delays in instituting control measures could have lead to a far greater problem. Recommendations on control measures were also implemented quickly and effectively and incoming guests were given full information.
Transparency in dealings between enforcement authorities and businesses, and between businesses and their customers, are key to fostering such an approach.

7.0 Wider Recommendations

7.1 The use of silver catalysed hydrogen peroxide as a fogging agent would appear on face value to be an effective technique for environmental decontamination. Further field trials would be helpful in confirming this.
In order to generate statistically useful results it would probably be best if such a project could be taken on either by SCIEH or at Health Board level.

Martin McNab
Senior Environmental Health Officer
22 September 2003

The contents and conclusions of this report have been discussed and agreed by
Dr Marianne Vinson, CPHM Argyll & Clyde NHS Board.

HOTEL DISINFECTION FOLLOWING NORWARK VIRUS INFECTION

BACKGROUND:

The ****[2] Hotel received a number of guests from a cruise ship on the Wednesday evening who had picked up the Norwalk virus and were all suffering. Spraying AEROS® on the Friday morning allowed 2 weddings to take place in the hotel - no further cases reported after spraying

Bob Wilson

2. REPORT ON THE DISINFECTION:

DB ECOsystems Visit Report to ****[2] Hotel at Gourock Sept 01, 2003

The ****[2] Hotel at Gourock had an out break of the Norwalk virus. From Wednesday 27, August to Friday 29 August 40 cases of this virus. Most if not all of the affected had been on a cruise on the River Clyde. They were also members of a coach party.

Inverclyde EHO department were also involved. The EHO is Martin McNab (01475 712629).

Rod Smith of ****[2] Hotel asked if DB ECOsystems could attend and fog disinfect about 20 rooms, corridors, public toilets, bar areas as well as the restaurant and the wedding suite. This was done on Friday August 29. Since the fog disinfection on Friday 29 August until 07.30 on Monday September 1 there were no new reported cases from the Guests.

An AEROS® solution was used. This was Fogged into the air using an Allman "Little Atom" Fogger which has a container which holds 5 litres of Liquid.

The application was carried out by DB ECOsystems personnel wearing disposable over shoes, disposable boiler suit, safety goggles, face mask and disposable rubber gloves.
NOTE: The personal protection equipment was to protect the wearer from the Norovirus in the hotel and NOT from the chemical being sprayed!

Each room that was disinfected had windows and curtains shut. All electrical equipment was disconnected. Cupboards and drawers were opened. Each room was entered and fogging started making sure that the curtains were thoroughly fogged as well as the inside of the cupboards. The procedure was to walk backwards fogging into the corners and up to the ceiling ensuring that there was a good fog in the room. For the ensuite bathrooms all taps, sink and toilet seats were directly fogged. It was essential to ensured that there was a good fog in the air. This took about 90 seconds per room. The room was then shut for one hour before cleaning staff were allowed in to air the room and make beds etc. It was noted that there were no odours in the room when the staff went in. After one more hour the rooms would be ready for re occupation. There was no noticeable dampness in the rooms.

The corridors on all 3 floors were done in a similar way. The public toilets were done in the same way as the ensuite bathrooms.

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For the function suite a light fog was achieved as the tables were set up for a wedding reception which took place about 2 hours after the fog. A very large room was fogged for 5 minutes.

For the restaurant and the bar area, 5 litres of 3% solution was used turning the fogger every 5 minutes. After 15-20 minutes a good fog was achieved. When finished in this room, the tables were slightly damp to touch and there were no noticeable marking on the tables.

Once fogging was completed all disposable items of clothing were put in a black bag and disposed safely by the hotel along with their own materials for disposal.

For the whole operation nine one litre bottles of AEROS® were used. The total time taken to disinfect the hotel was about 2.5 hours. There was no disruption to the operation of the hotel.

Figuur 1 Fogging of Hotel corridor using Allman “Little Atom” Fogger

3. COMMENTS FROM THE HOTEL

We had about 40 cases reported since Wednesday morning and since the spraying (as at 07:30 Monday am) we had NO new cases from guests and about 3 staff which is far better then we could have dreamed of or even anticipated. I appreciate that we can not categorically state that it was the misting but it must have been - to suddenly stop. We expected the staff to roll on a bit longer anyway but not to have any further guests was excellent. I think the EHO was impressed and I am sure he will be when he returns from holiday next week - they look after the cruise line terminal so you may get some work from them.
You will have to set up a 'infection response team'
Another market is coaches - the coach company called out Rentokil to clean the coach - they used a small hand spray with 'VIRKON' in it but it didn’t seem very professional as the spray couldn’t have reached all parts.

Will speak soon
MANY THANKS
Rod