

NOROVIRUS CHALLENGES ABOARD CRUISE SHIPS

EILIF DAHL ¹

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NOROVIRUS CHALLENGES

Being in a ship is like being in jail, with the chance of being drowned
(Dr. Samuel Johnson)

Gastroenteritis is a major health concern aboard cruise ships [1]. Poor sanitation systems and contaminated water and food used to get the blame. As the North American market covers 2/3 of the global cruise volume [2], the U.S. Centers for Disease Control and Prevention (CDC) were particularly interested in this subject and established already in the 1970's the Vessel Sanitation Program (VSP) in cooperation with the cruise industry [3]. The comprehensive program helped the ships to minimize the risk of

¹ Prof. Dr Eilif Dahl, MD, MHA, PhD
From the Surgical Department, Rikshospitalet – Radiumhospitalet Medical Center
Oslo, Norway
Corresponding address:
Eilif Dahl, MD, MHA, PhD, Surgical Department, Rikshospitalet-Radiumhospitalet
HF, 0027 Oslo, Norway.
Phone: (47) 22 56 23 24; fax: (47) 22 56 31 12; cell phone: (47) 959 21 759;
e-mail: eilifdahl@hotmail.com

gastrointestinal diseases. Being successful but expensive, CDC in 1986 terminated portions of the program. But pressure from the public and the cruise lines made CDC restart the VSP and now charges a user fee from the cruise lines, based on the vessel's size, for inspections [3]. All foreign vessels visiting US ports with 13 or more passengers are subject to a comprehensive reporting system prior to entering a US port, as well as twice-yearly inspections and, when necessary, re-inspection [4]. Each inspection results in a sanitation score, which is posted on the internet ('Green Sheets')[5]. High scores are used by the companies and travel agents for promotion, while scores below 85 (of a total of 100 possible) points can stop the ship from sailing.

Cruise lines with ships that are not able – or willing to try - to pass US inspections can only visit ports with less rigorous sanitation demands. However, they should not feel too confident: The 'European Centre for Disease Control and Prevention' (ECDC) has been established and presently coordinates European actions to 'prevent and control norovirus outbreaks on cruise ships, including development of practical and standardized guidelines based on best practices identified from previous experience' [6]. Certainly more countries will follow, and hopefully they will not all attempt to 're-invent the wheel'. For the cruise industry it is very important to get proactive and encourage true international cooperation in this field, to get the health authorities of all countries with ports to cooperate and agree on uniformity. Cruise ships move quickly between countries with different sanitation standards, and for them it is very time-consuming and frustrating to keep track of the various demands and in each port fill out new forms, with different requests and layouts. *To establish common global guidelines, including one internationally accepted standard reporting form that can be used all over the world, must therefore be prioritized.*

The VSP has proven an effectively tool to keep all involved in sanitation on their toes, but despite good performance on health inspections outbreaks of gastroenteritis per 1000 cruises increased almost tenfold from 2001 to 2004. The increase is likely attributable to noroviruses [7]. Gastroenteritis caused by norovirus is very contagious, and although outbreaks may begin as food borne or water borne disease, the virus is easily transmitted by person-to-person contact [8]. The outbreak increase highlights the inability of environmental programs to fully predict and prevent risk factors common to person-to-person and fomite spread of disease [7]. Several ships have had to stop operations and cancel cruises following such outbreaks to decontaminate the vessels [9].

Compulsory isolation of passengers and crew with gastroenteritis is a necessary measure to prevent and control norovirus outbreaks aboard. The 2005 version of CDC's *VSP Operations Manual* recommends isolation of food- and water-handling crew for 72 hours and of other crew and of passengers for 48 hours after their last symptom [4]. Although viruses are shed longer than that, the danger of contamination is significantly

reduced after the symptoms have subsided, especially if proper hand-washing procedures are followed. It is therefore a matter of discussion how long and how rigorously the patients really must be isolated.

Isolation is taxing, not only for the patient, but also for family and other travel and cabin mates, as well as for all the various ship employees that get involved. The doctors' unwanted role as warden puts a heavy strain on the doctor-patient relationship from the beginning. The medical staff members are regularly threatened, - with physical harm, poor service ratings or lawsuits, and all the extra work, especially during outbreaks, makes them less available for more serious emergencies [1]. Also, a study showed that the obligatory isolation policy had doubled the number of sick leave days for crew, and thereby impaired daily operations [10].

When discussing isolation, it should be taken into consideration that isolation itself is not without dangers. Here are some recent examples of isolation hazards from my own shipboard practice [11]:

- On one ship 3 out of 4 security guards shared a cabin. When one of them got ill, the other two had to be isolated with him, and the ship had only one guard left to take care of security for days.
- Isolation means jail, even in luxurious surroundings, and it caused various degrees of depression. A Panama cruise will be ruined if the day of trans-canal passage must be spent alone in a windowless cabin. Although possibly coincidental, following extended isolation one person jumped overboard and disappeared.
- The isolated persons were followed closely by the medical staff, but from a distance, as physical contact has to be kept to a minimum. Therefore, clinical examinations suffered. As the person in closest contact with the patients, the doctor is at high risk to get infected. If the only doctor gets ill and must be isolated, the situation aboard is likely to turn ugly real fast.
- Isolation had to be done in staterooms away from the medical center to protect other patients. As electrolytes couldn't be determined while the patients were isolated outside the medical center, laboratory diagnostic work-up suffered.
- Patients with diabetes were cut off from their regular routines, and their condition became more difficult to handle.
- Within one month two elderly men with peritonitis had to be evacuated; both waited until their appendices burst, and they were certain that their symptoms were too serious to be simple gastroenteritis and trigger mandatory isolation. Hence, simple fear of isolation may keep patients from seeking prompt medical attention, thus delaying diagnosis and treatment of life-threatening illnesses.

These examples illustrate that cruise lines - in cooperation with the health authorities - must continue *to search for ways to safely reduce the mandatory isolation length and rigidity and to agree on industry standards*. They must find ways to make isolation easier to handle for the medical staff by providing them with sufficient practical and secretarial assistance when the cases of gastroenteritis start to add up. They must establish guidelines and practical help to make isolation itself as low-stress as possible both for passengers and crew, by providing pleasant isolation quarters, preferably with balcony or outdoor access. Furthermore, systems should be established to allow still isolated, asymptomatic patients to exercise, to watch shows and to participate in activities aboard and ashore without risk of contaminating others.

Unfortunately, it is not possible at this point to quickly distinguish between norovirus and other causes of gastroenteritis. *A bed-side test that with certainty can rapidly confirm or rule out norovirus would be a huge step forward*. Until such a test is available, a relatively high number of patients without viral gastroenteritis will have to be unnecessarily confined for days after they feel well.

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