Methods

We searched through Pubmed and Scopus scientific databases, using the following search terms: “norovirus infections” and “norovirus disease outbreaks” combined with “cruise” and “cruise ship”. We included eligible studies published from January 1990 to March 2013, fulfilling the following criteria: papers written in English and Italian languages, describing infectious episodes involving at least two passengers and/or crew members on commercial cruise ships. Data on geographic location of the cruise, number of people affected and diagnostic methods were collected for each selected article.

Results

As results, 12 studies and 10 reviews met the inclusion criteria, for a total of 116 outbreaks described. The majority of the cases (84%) were reported in Europe and USA, affecting from 2.5 to 41.0% of the embarked people. Regarding the diagnostic methods, in all the studies, except for one (in which the food was tested), stool samples and/or serum specimen from ill passengers were collected by medical personnel aboard cruise and then tested for laboratory-confirmation. In addition, more than 50% of studies reported that an ad-hoc questionnaire was administered in order to collect epidemiological and clinical data.

Conclusions

Given the recent emergence of new strains of norovirus in Europe and worldwide, our findings suggest the strong need for monitoring and implementing preventive measures in semi-closed communities, such as cruise ships. It would be advisable to strengthen initiatives, such as the SHIPSAN project by the European Centre for Disease Prevention and Control, in order to improve detection response and control of norovirus outbreaks on cruise ships.

Key messages

- Results of our review confirm norovirus outbreaks on cruise ships are a serious public health concern, needed to be strongly monitored.
- Continuous monitoring of outbreaks of norovirus diseases on cruise ships could be useful to limit the consequences for passengers and crew members.

Norovirus outbreaks on commercial cruise ships: a systematic review and new targets for the public health agenda

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Background

Norovirus is a leading cause of foodborne-disease outbreaks in the Western countries. As reported by the US Centers for Disease Control and Prevention, over 90% of diarrheal disease outbreaks on cruise ships are caused by norovirus. Given the potential harmful consequences for passengers and crew members and the high costs for cruise companies, disease outbreaks on cruise ships represent a serious public health issue. The aim of our study was to systematically review published studies related to Norovirus outbreaks occurring on commercial cruise ships.