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Public Health

journal homepage: www.elsevier.com/puhe

Original Research

Assessment of timeliness, representativeness and quality of data reported to Italy's national integrated surveillance system for acute viral hepatitis (SEIEVA)

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ARTICLE INFO

Article history:
Received 15 July 2014
Received in revised form
30 January 2015
Accepted 6 February 2015
Available online xxx

Keywords:
Acute viral hepatitis
Surveillance
Evaluation
Representativeness
Quality
Timeliness
Hepatitis A
Hepatitis B
Hepatitis C

ABSTRACT

Objectives: Periodic assessment of surveillance systems is recommended to verify whether they are appropriately monitoring the public health problem under surveillance. The aim of this study was to evaluate timeliness, data quality and representativeness of data reported to the Italian Integrated Epidemiological System for Acute Viral Hepatitis (SEIEVA).
Study design: Cross-sectional analysis of surveillance data.
Methods: Quantitative indicators were used to evaluate representativeness of reported cases, data quality, and timeliness between surveillance steps, for reports of acute viral hepatitis cases with date of onset of symptoms from 2009 to 2012 (N = 4516).
Results: Representativeness was 75%. Over 95% of records reported information on age, sex, city of residence, risk factors for hepatitis A and vaccination status. Information on risk factors for hepatitis B and C were reported less consistently (83%), as was information on early outcome (60%). Wide delays were found between surveillance steps.
Conclusions: The system collects high quality data on acute viral hepatitis cases in Italy. Timeliness was found to be the main limit and needs to be improved by optimizing web-based reporting procedures, increasing communication with participating centres, improving feedback and increasing dissemination of surveillance results. The study highlights the importance of reporting timeliness to detect outbreaks of acute viral hepatitis.

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http://dx.doi.org/10.1016/j.puhe.2015.02.015
0033-3506/

Introduction

Viral hepatitis is a major public health problem worldwide because of its burden of illness and death and its potential for outbreaks and epidemic spread. It is most frequently caused by infection with one of five different viruses: hepatitis A virus (HAV), hepatitis B virus (HBV) hepatitis C virus (HCV), the HBV-associated delta agent or hepatitis D virus (HDV) and hepatitis E virus (HEV). HAV and HEV are transmitted almost exclusively by the faecal-oral route and generally cause self-limiting infections, while HBV, HCV and HDV are transmitted via the parenteral route (exposure to blood and body fluids) and have the potential to cause chronic liver disease (chronic hepatitis, cirrhosis, hepatocellular carcinoma).[1,2] The various types of viral hepatitis cannot be differentiated clinically, but can be distinguished by specific serologic testing.

Thanks to improvements in socio-economic status and hygienic conditions, increased use of disposable materials in medical settings, improved safety of blood supplies, and introduction of a compulsory vaccination programme for HBV, in the past two decades there has been a progressive decrease in the incidence of acute viral hepatitis in most economically developed countries. However, the global burden of disease due to viral hepatitis continues to be high.[3] Globally, every year there are an estimated 1.4 million new HAV infections and three million acute cases of HEV. Hepatitis B and C disease burden includes not only acute disease but also chronic infections. It is estimated that about two billion people have been infected with HBV worldwide; of these, 240 million are chronically infected. About 150 million people are chronically infected with HCV. Approximately one million people die each year (~2.7% of all deaths) from causes related to viral hepatitis, most commonly liver disease, including liver cancer.[3] Hepatitis A and B can be prevented through safe and effective vaccines while no vaccines are currently available to protect against the other hepatitis types.

In Italy, rates of HBV and HCV infections have declined respectively from four cases/100,000 population in 1992 to 0.9/100,000 in 2012 and from 2/100,000 in 1992 to 0.3/100,000 in 2012.[4] The introduction, in 1991, of a compulsory vaccination programme has contributed to the drop in incidence of HBV infection.[5,6] Despite a decreased incidence, 2000–2500 acute hepatitis infections, about 50% of which attributable to HAV, 35% to HBV, and 10% to HCV, are notified each year. Occasional HAV outbreaks continue to occur.

In Italy, viral hepatitis is included in the national notifiable infectious diseases surveillance system.[7] In this mandatory system, implemented in 1975, physicians are required to report any clinically suspected case of acute viral hepatitis to the local health unit (LHU) within 48 h of diagnosis. They are also required to specify the hepatitis type diagnosed (HAV, HBV or nonA-nonB infections), based on serological tests performed (including detection of specific antigens or antibody responses to HAV or HBV). LHUs report individual cases to the Ministry of Health. Collection of information for each case is restricted to age, sex, profession, place of residence, date of onset of symptoms, hospitalization and vaccination status.

In addition to the mandatory notification system, a voluntary surveillance system was implemented in 1984 to improve epidemiological investigation of cases and collection of risk factor information. This system, named 'SEIEVA', an acronym for 'Integrated Epidemiological System for Acute Viral Hepatitis', consists of a network of LHUs located throughout Italy and is coordinated by the National Centre for Epidemiology, Surveillance and Health Promotion of the National Institute of Health (Istituto Superiore di Sanità – ISS).[8] In participating LHUs, cases of acute viral hepatitis reported by physicians through the mandatory reporting system are interviewed by a staff health care worker (either face-to-face or by telephone), by using a structured questionnaire to collect information on sociodemographic characteristics, parenteral risk factors in the six months prior to disease onset, faecal-oral risk factors in the previous six weeks, and disease outcome (occurrence of encephalopathy, fulminant disease, need for liver transplant and death). The questionnaire form used is identical regardless of hepatitis type. However, since risk factors and time period for potential exposures vary by type of hepatitis, risk factor information for the different hepatitis types is collected in different sections.

Completed questionnaires are sent to the coordinating centre at the ISS through a dedicated website (85% of participating LHUs) or, alternatively, by post or fax. Surveillance steps are shown in Fig. 1. The case definition used is based on clinical and serological criteria, as described in the Methods section.

Incidence rates and percentage of cases reporting specific risk factors are calculated and published yearly in a dedicated web-site. Surveillance data is also disseminated through publication of articles in the international literature.[5,6,9,10]

Besides monitoring burden of disease and trends in incidence of each hepatitis type, SEIEVA's main objectives are to detect outbreaks, identify at-risk groups, generate hypotheses on sources of infection and modes of transmission, identify research needs and disseminate information to health professionals.

The availability of risk factor information has allowed SEIEVA to highlight the role of specific risk factors in viral hepatitis transmission. Examples include the risk of acquiring parenteral hepatitis after a surgical procedure or after exposure to certain beauty salon treatments.[9,10] Also, since its introduction, SEIEVA has shown to be a flexible system; for example, it introduced collection of laboratory testing results for antiHCV in a timely manner, soon after testing became available in clinical practice, thus allowing for the differentiation between HCV and nonA-nonB hepatitis cases. However, a recent large outbreak of hepatitis A cases involving various Italian regions was not promptly detected by the surveillance system.[11] Several international alerts were released in April 2013 because of an observed increase in the number of HAV cases reported in several European countries,[12–14] following which local SEIEVA contacts were asked to promptly report any new HAV cases to the system. This allowed for rapid collection of data regarding cases, including risk factor information. Despite initial delays, the system therefore proved to be a very useful tool for assessing the outbreak at the national level, including sources of infection.[11]

Please cite this article in press as: Tosti ME, et al., Assessment of timeliness, representativeness and quality of data reported to Italy's national integrated surveillance system for acute viral hepatitis (SEIEVA), Public Health (2015), http://dx.doi.org/10.1016/j.puhe.2015.02.015