

Original paper

Searching for the optimal population for hepatitis C virus screening in Poland

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Abstract

Aim of the study: The purpose of the study was to select the optimal target population for a possible national hepatitis C virus (HCV) screening program in Poland, based on the most recent available data.

Material and methods: The analysis included 723,654 participants from different populations screened for anti-HCV. Testing was performed in the whole blood using rapid anti-HCV kits. Presence of HCV RNA was additionally demonstrated in some anti-HCV positive patients with the real-time polymerase chain reaction method.

Results: Altogether 3,548 anti-HCV positive individuals were identified, so the prevalence rate in the whole studied population was 0.5%. The highest percentage (1.2%) was shown by diagnostic laboratories, which offered rapid testing for patients visiting their offices during the HCV awareness campaign. Relatively high anti-HCV prevalence of 0.6-0.7% was noted in hospitals and in private medical centers, as well as during music concerts. Surprisingly, the lowest prevalence (0.2%) was observed in general practitioners' offices. Among 502 anti-HCV positive individuals tested additionally for HCV RNA, viremic presence was demonstrated in 40%.

Conclusions: Anti-HCV testing in Poland should be carried out using rapid anti-HCV kits at the patients' admission to the hospitals and should also be offered to patients during their visits for any purpose in diagnostic laboratories or private medical centers.

Key words: HCV, screening, hepatitis.

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Introduction

According to the most recent estimations, 71 million people are living with hepatitis C virus (HCV) infection worldwide [1]. The goal of the World Health Organization (WHO) strategy is elimination of viral

hepatitis as a major public health threat. Since the global eradication of any infectious disease is possible only by a successful mass vaccination program, such a scenario is not attainable for HCV, because no vaccine against this virus is available. Introduction of highly effective and safe direct acting antivirals (DAA)

Table 1. Screening for anti-HCV initiatives/actions carried out in 2018 and 2019 in Poland (alphabetical order)

Initiative/action	Description
Diagnostic laboratory	Rapid testing in diagnostic laboratory network during HCV risk factors awareness campaign
Foundations, points of testing	Testing during HCV awareness events organized by patient advocacy groups and foundations and testing at HIV consultation – diagnostic anonymous points where anonymously and without referral the patient can get HIV and HCV tests
General practitioners	Cooperation with family doctors' offices, i.e. with GPs and nurses who performed testing of patients in area of their activity
HCV awareness weeks	Testing during HCV awareness weeks in 10 biggest seaside healthy resorts
"Healthy Liver" program	Anti-HCV testing was carried out in regional hepatologic clinical centers
Hospitals	Rapid HCV testing with education at admission to the large hospitals providing access to HCV therapeutic programs As a result identified patients received fast linkage to care
Local activities for seniors	Universal, countrywide screening provided during events in nursing homes, diabetic clubs, senior clubs, registry office staff, social welfare homes, etc.
Music concerts	The biggest music festivals in Poland targeted for population including tattooed people and people who inject drugs
Private medical centers	HCV testing in private medical center facilities (provided by entities other than government); selected age group 50+
Sanatoriums	Testing was carried out in sanatoriums with predominant population of elderly
Summer outdoor events	Addressed to participants of local events such as harvest festivals, sporting events (marathons, runs), other festivals
Production companies	Testing carried out in different production companies

has changed the landscape and perspectives of HCV treatment [2, 3]. Unfortunately, a large proportion of HCV-infected patients are still undiagnosed and at the risk of development of cirrhosis and/or hepatocellular carcinoma [4]. The major problem in European countries is lack of national screening programs, which is usually due to the lack of political will to spend additional money on searching for potential candidates for therapy. It is also related to difficulties in selection of so-called high risk groups among populations with relatively low HCV prevalence [5].

The purpose of the study was to analyze screening programs for anti-HCV carried out recently in Poland, to identify populations which demonstrate the highest antibody prevalence rate and therefore should be considered as an optimal target for a possible national screening program for HCV infection in Poland.

Material and methods

We collected data from a number of initiatives/actions of screening for anti-HCV antibodies, carried out in Poland in 2018 and 2019. The analysis included 723,654 participants from different populations and was performed by different organizations/institutions during different screening initiatives/actions. Data were collected by authors who were involved in particular activities as representatives of the Polish Expert Group for HCV. A description of each tested group is included in Table 1. Testing was performed in the whole blood using rapid anti-HCV kits, detecting antibodies generated against the proteins encoded by all HCV gen-

otypes' most conserved parts of Core, NS3, NS4, and NS5 regions in the HCV genome, which demonstrate sensitivity of 100% and specificity of 100% according to manufacturer (Türklab, Izmir, Turkey). During the initiative carried out by the diagnostic laboratories, presence of HCV RNA was additionally tested with the real-time polymerase chain reaction (RT PCR) method in 502 among 753 anti-HCV positive patients.

Results

Altogether, 3,548 anti-HCV positive individuals were identified, so the prevalence rate in the whole studied population was 0.5%. The highest percentage (1.2%) was shown by diagnostic laboratories, which offered rapid testing to patients visiting their offices during the HCV awareness campaign. As demonstrated in Table 2 relatively high anti-HCV prevalence of 0.6-0.7% was noted in hospitals and in private medical centers, as well as during music concerts and in testing by foundations. Surprisingly, the lowest prevalence (0.2%) was observed in offices of general practitioners and in sanatoriums (Table 2). Among 753 anti-HCV positive individuals identified during the testing initiative in diagnostic laboratories, 502 were additionally tested for HCV RNA and 203 were viremic (40%).

Discussion

Hepatitis C virus surveillance in Poland has been measured with a number of epidemiologic studies carried out in the current century. Studies before 2010

Table 2. Prevalence of anti-HCV antibodies among those tested during different initiatives/actions carried out in 2018 and 2019 in Poland

Initiative	Number of people tested	Number of anti-HCV(+)	Prevalence
Diagnostic laboratory	62,305	753	1.2%
Foundations, points of testing	37,220	268	0.7%
Hospitals	80,082	586	0.7%
Music concerts	7,937	46	0.6%
Private medical centers	57,163	318	0.6%
"Healthy Liver" program	8,876	35	0.4%
HCV awareness weeks	55,209	196	0.4%
Local activities for seniors	43,074	142	0.3%
Summer outdoor events	17,944	46	0.3%
Production companies	40,825	106	0.3%
Sanatoriums	30,335	59	0.2%
General practitioners	91,763	139	0.2%
Other	187,927	554	0.3%
All	720,660	3,248	0.5%

were usually conducted in small, unrepresentative populations and demonstrated anti-HCV prevalence of 1-2%. Based on further studies we know that only 26-66% of individuals positive for anti-HCV are viremic, depending on the studied population [6]. In the current study we observed a 40% rate of viremic cases among anti-HCV positive individuals. However the first large epidemiologic study estimating the prevalence of HCV RNA positivity in Poland was conducted in the years 2009-2010 and included 26,057 individuals. This study demonstrated 0.6% incidence of viremic infections, which corresponded to 230 thousand Polish inhabitants, mostly unaware of the disease [6]. Another study, completed in 2016 within a Swiss Contribution program, confirmed 0.47% prevalence of HCV RNA among 21,875 individuals [7]. Despite HCV prevalence overestimation using anti-HCV testing compared to viremic testing, serial measurement of the anti-HCV positivity rate can be considered as a useful measure of changes in the HCV epidemiologic situation. The only such large study carried out in Poland was performed within 11 years in 61 805 persons and revealed a downward trend in anti-HCV antibody incidence from 3.2% in 2004 to 1.1% in 2014 [8]. However, the largest database of anti-HCV testing is presented in the current study, which included 720,660 people tested in 2018-2019. The average anti-HCV positivity rate of 0.5% confirms tendency demonstrat-

ed in the previously cited study. However, the most important message from our study is the indication where screening testing for HCV with rapid diagnostic kits should be carried out for better performance and further identification of candidates for highly effective treatment. It is clear from our study that testing for anti-HCV should be performed first of all in hospitals at the moment of patients' admission, and in diagnostic laboratories, which can offer anti-HCV testing for patients referred due to any other laboratory analysis. Another good option seems to be anti-HCV testing in private medical centers. Based on the presented data we no longer recommend anti-HCV testing in the general practitioners'/family doctors' offices, in sanatoriums or during local recreational events. On the other hand, there is a need to test populations which were not included in this study, such as drug users, inhabitants of small towns and villages with poor access to specialist health care, and finally prisoners.

In conclusion, anti-HCV testing in Poland should be carried out using rapid anti-HCV kits at the patients' admission to the hospitals and should also be offered to patients during their visits for any purpose in diagnostic laboratories or private medical centers.

Disclosure

The authors report no conflict of interest.

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