

Anti-HCV antibodies detection frequency in groups of patients hospitalized on chosen clinical wards

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Abstract

After the outbreak of an enemy of hepatitis C, a number of epidemiological analyses have proven that the HCV infection poses a particular threat to patients and medical personnel. According to the latest statistic data, over 1.5% of Polish population are carriers of the pathogen. The route of HCV infection, which in 90% of cases transits from an acute to a chronic form, results in a major risk of late complications occurrence, including developing of hepatocarcinoma. Lack of effective specific treatment, places prophylaxis as the only way of preventing the disease.

The following study was based on comparison between files from database from 1998 and experimental data from 2004. The experiment proved a substantial decrease in the number of positive results within the space of 6 years. Therefore the efficacy of unspecific prevention has been confirmed.

Key words: HCV, haematogenous infection, hepatocarcinoma, unspecific prophylaxis.

Introduction

Hepatitis C virus is a ssRNA+ hepatotropic virus that belongs to the Flaviviridae family [1, 2]. Although 11 genotypes and 70 subtypes of the virus are known [3], the majority of infections in adult Polish populations is caused by 1b genotype. However, as proven in different studies the most prevalent in patients on oncohaematological wards is 1a (94.25% of all infections) [4]. Identification of the pathogen took place in 1989; previously HCV was described as non-A non-B (NANB) [5]. Virion is stable in pH between 8 and 8.7 and cannot be inactivated by organic solvents [6].

Frequency of incidents of hepatitis C in European and North American populations varies from 1 to 1.5% while in countries of the Third World the percentage is over 6%. The total number of HCV infections in a global scale is estimated for more than 170 million of infected people. Japan has the highest number of stated hepatitis C per year, while in European countries the carriers state prevalence varies considerably. As recent studies indicate this factor increases from the north to the south of the continent [7-9].

Among the number of routes of infection parenteral (45%) sexual and perinatal are the most frequently mentioned, although the latter is reported to be much rarer than in the case of HBV transmission [10]. In 45% of cases a source of infection usually cannot be recognized. Drug addicts, patients requiring blood transfusions and haematogenous preparation, undergoing

bone marrow transplantations, staff at risk of occupational exposure but also sexual partners of HCV carriers, those groups of high infection risk are said to be especially exposed to virus transmission [8].

The incubation period accounts for an average 3 to 4 weeks (according to different sources 15 to 180 days) [9]. HCV infection proceeds as a viral hepatitis of acute or chronic character [1, 11]. Cirrhosis rates among most frequent complications of past hepatitis C, as it appears in 30-50% of cases [12]. Hepatocarcinoma occurrence is estimated to be on the average 5% in different populations while its developmental period lasts 30 years [1, 13].

Genetic predisposition has been affirmed in recent researches considering the development of hepatocarcinoma in Asian and Eskimo populations the highest risk of acquiring this type of cancer occurs when the infection takes place in the perinatal period [12].

Among different complications, the extrahepatic ones include: membrane glomerulonephritis, Sjögren syndrome, cryoglobulinaemia, aplastic anaemia [1].

The standard diagnostic procedures detecting HCV infection in the peripheral blood are based on molecular biology techniques (RT-PCR; real time-polymerase chain reaction), Western-blott and serological methods (EIA- Enzyme Immunoassay) [7].

Currently no effective specific treatment of hepatitis C is known. However, a number of attempts of combined treatment with ribavirin (Rebetol) and interferon α (Rebetron) have been performed.

It has been proven in laboratory tests that an association of the two medications cause a transient decrease in hepatic enzymes; however, their activity reincreases after the therapy is discontinued [14, 15].

So far there have been no effective methods of specific prevention, which is associated with genetic lability of the virus. Therefore non-specific prophylaxis is in a majority based on reinforcing supervision over blood donation, organ transplants, improving aseptic and health awareness [1].

Aim of the paper

The aim of this study was to evaluate the efficacy of unspecific prophylaxis methods used against the spread of HCV infections. The research was

performed on randomly chosen groups of patients treated in the Clinical Children Hospital (CCH) in Lublin. The data used in this study were based on researches conducted in 1998 and 2004.

Material and methods

The experimental investigation was conducted by means of ELISA (Enzyme-Linked Immunosorbent Assay) diagnostic test-INNOTEST HCV AbIV by Innogenetics. The assay was to mark the anti-HCV antibodies presence. Researches were carried out on random chosen groups of serum samples acquired from patients hospitalized in (CCH) clinics. Results from 2004 were compared with files from 1998 stored in the virology department. The experimental material on individual wards is as follows: oncohematology (23 tested serum samples), gastroenterology (21) and neurology (12). The average age of the above mentioned groups is 10.6; the age distribution is 3.5 months to 19 years.

The number of tested serum samples in 1998 is as follows: oncohematology – 592, gastroenterology – 32, neurology – 1. The average age of this group is 9.4, age distribution is from 6 months to 18 years.

Results

Table I presents the comparison of anti-HCV antibodies detecting frequency in 1998 and 2004. The tests were conducted on the material obtained from chosen wards of the Clinical Children Hospital in Lublin. The distribution of seropositive results is as follows: in 2004 – oncohematology 4.35%, in 1998 – 11.65%; gastroenterology in 2004 out of 21 tested serum samples none was positive, in 1998 – 18.75%; neurology – 5.88%. Considering the fact that data from 1998 were insufficient, evaluation of the epidemiological situation in the clinic of neurology is difficult to state.

Discussion and conclusion

In the conducted researches, a substantial decrease in the number of positive results was observed. The target of the studies was an estimation of anti-HCV antibodies present in tested groups of patients hospitalized in clinical wards in

Table I. Comparison of anti-HCV antibodies detection frequency in groups of patients from the Children Clinical Hospital

Clinics of the Children Clinical Hospital in Lublin	1998			2004		
	Number of samples tested	Anti-HCV antibodies		Number of samples tested	Anti-HCV antibodies	
		Present	Percentage		Present	Percentage
Oncohaematology	592	69	11.65	23	1	4.35
Gastroenterology	32	6	18.75	21	0	0
Neurology	1	0	0	17	1	5.88

2004. The test results were compared with files from 1998. In the light of the above-mentioned experimental outcome indicating a decrease in HCV infections prevalence, the effectiveness of non-specific prevention has been proved [16]. That is the argument supporting the idea of continuing it as well as the serological methods confirming existence of HCV infection. The latter should be performed especially in groups of frequently hospitalized children owing to a higher risk of transferring infection within these groups [7, 10].

At the same time, a significantly higher rate of infected patients from oncohematological wards was observed in comparison to other wards. According to different authors this percentage ranges from 42.4% to 52.7% [4, 16]. This fact is explained by a special characteristic of diagnostic procedures and treatment of oncohaematological patients. Frequent hospitalisations pose a special threat to patients as it results in hypimmunity which is caused by intensive immunosuppression treatment. Another problem is that they often undergo transfusions and other interventions disrupting tissue continuity. All of these procedures create a particularly high risk of infection for patients in children oncohaematological wards as the virus penetrates into the blood more easily [4, 10].

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