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Prevalence of HCV Virus among Thalassemia Patients in Albania

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Abstract: ***Background: The hepatitis C virus is a bloodborne virus that causes acute and chronic hepatitis infection. It is a major global healthcare problem, causing an increase level of liver- related morbidity and mortality. Up to 3% of the world's population has been infected with the virus, equating to more than 170 million carriers of HCV worldwide. 80% of the HCV virus infected persons become persistently infected and 30% of these develop progressive liver disease such as cirrhosis and hepatocellular carcinoma (HCC), that's why HCV infection is now the leading reason for liver transplantation. In most European countries, patients with transfusion-dependent thalassaemia and other haemoglobinopathies represent a population of patients that was infected with HCV and other infection diseases, during the years preceding the development and implementation of sensitive and specific mandatory blood screening for HCV. Methods: For this study we enrolled 103 multitransfused patients with thalassaemia disease at the University Hospital "Mother Theresa" of Tirana, Albania. The collected blood were tested for HCV, HBV and HDV virus. Results: The prevalence of HCV virus among the thalassaemia patients was 28% (29/103). According to the age groups, we noticed that prevalence of HCV virus was higher among the patients between 10-20 years old. Meanwhile 12.6% (13/103) of the patients resulted positive for HBsAg and among them 15% (2/13) resulted positive even for HDV virus. Conclusions: Prevalence of viral hepatitis as HCV, HBV is high among the multi-transfused thalassaemia patients and is influenced by the amount of blood transfusions and the screening process of the blood donors.***

Keywords: Hepatitis C Virus, Hepatitis B Virus, Hepatitis D Virus, Coinfection, Thalassaemia, Albania

1. Introduction

Hepatitis C virus (HCV) is considered the principal etiologic agent of post-transfusion hepatitis and is the main cause of chronic liver disease in multi-transfused subjects. It is a major global healthcare problem, causing an increased level of liver- related morbidity and mortality. Up to 3% of the world's population has been infected with the virus, equating to more than 170 million carriers of HCV worldwide [1, 2, 3].

Patients with thalassaemia are at high risk of acquiring a number of viral infections during multiple blood transfusions. To prevent these infections is mandatory the screening process for antibodies anti-HCV and other viruses to the blood donors. However, it remains a challenge for our health care systems as a country that still have a high annual mortality rate, according to the data of Health Grove. Even though the annual mortality rate per 100.000 people from thalassaemias in Albania has decreased by 48.4% since 1990, it continues to be among the countries with high annual mortality rate (range 0,4-2,7) [4].

In most European countries, patients with transfusion-dependent thalassaemia and other haemoglobinopathies, represent a population of patients that was infected with HCV during the years preceding the development and implementation of sensitive and specific mandatory blood screening for HCV, HBV and HDV, while post-transfusion hepatitis is still occurring in many countries of the developing world [5].

Even though the screening process of blood donors for HCV, the thalassaemia patients can acquire hepatitis C through the administration of HCV infected blood collected during the donor window period. For this reason the prevalence of HCV virus among thalassaemia patients is underestimated.

HCV infection, which is mainly of transfusional origin, remains a major concern in the field of thalassaemia. On average 12% – 85% of thalassaemia patients around the world including Europe are positive for anti-HCV antibodies [6,7].

Unfortunately, there are limited data about the prevalence of HCV virus among thalasemia patients in Albania, so this study is undertaken with the aim to represent an epidemiologic view about this infection in our country.

2. Methods

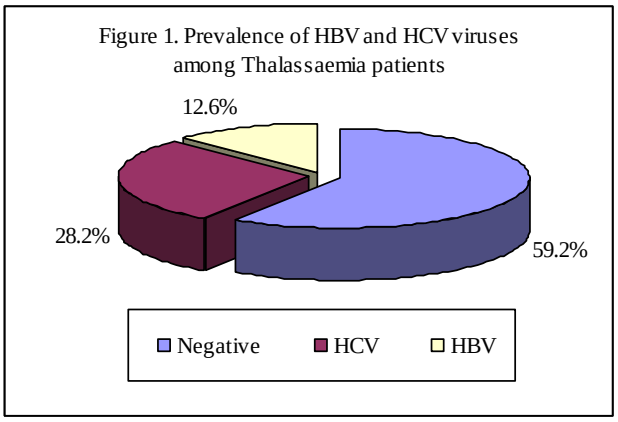
In this study, we enrolled 103 multi-transfused patients with thalassaemia disease at the University Hospital "Mother Theresa" of Tirana - Albania during 2010-2011 time frame. The collected blood samples were centrifuged and tested for antibodies anti-HCV, HBsAg and antibodies anti-HDV.

The tests were performed in the Laboratory of Blood Control for Infection Agents, at the National Blood Transfusion Centre (Tirana) using ELISA method, third generation (ABBOTT), the same method used for blood screening. Statistical analyses were done with Chi-square test. The result value of $p< 0.001$ were considered statistically significant for the test.

3. Results

Among 103 multitransfused thalassaemia patients, 28% (29/103) of them resulted positive for antibodies anti-HCV (Figure 1). Meanwhile, 12,6% (13/103) of the patients

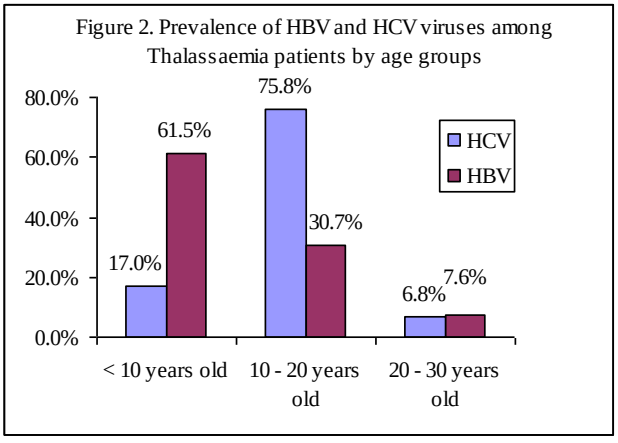
resulted positive for HBsAg and from them, 15% (2/13) resulted co-infected with HDV virus.



Among the patients that resulted positive for antibodies anti-HCV, the co-infection with HBV virus was present in two cases with 6,8% (2/29). Only two patients resulted positive for HCV, HBV and HDV virus.

Prevalence of HCV virus among thalassaemia patients was 17% (5/29) at the age group <10 years old, 6.8% (2/29) at the age group of 20-30 years old and was higher for the patients belonging to the age group of 10-20 years old with 75.8% (22/29) (Figure 2). The result value of $p< 0.001$ were considered statistically significant for the test.

Meanwhile, the prevalence of HBV virus was 7.6% (1/13) at the age group of 20-30 years old, 30.7% (4/13) at the age group of 10-20 years old and was higher for the patients belonging to the age group <10 years old with 61,5% (8/13) (Figure 2). The result value of $p< 0.279$ were considered statistically not significant for the test.



Since the sample size of patients who resulted positive for HDV virus is small, their distribution by age groups doesn't have any statistical significance.

4. Discussion

Patients with thalassaemia are at high risk of acquiring a number of viral infections because of multiple blood transfusions and the need to be hospitalized more frequently. Among these infections, hepatitis B, C and human immunodeficiency virus infections are extremely important. Preventing these infections is mandatory for improving survival and quality of life of thalassaemic patients. With this study we noticed that especially the prevalence of viral HCV markers among patients with thalassaemia is higher if compared to the general population [8].

As some researches have demonstrated, due to differences in viral morphology, the viral infectivity of HCV outside an infected person endures much longer than HIV's viral infectivity. HCV can survive outside the body, under certain conditions, increasing the risk for acquiring HCV virus [9,10,11].

It's important to highlight the necessity of the screening process for infection diseases among the blood donors. In Albania, the law on "Blood transfusion service, control of blood and blood components" has been in force since 1995 being improved with several guidelines and regulations. In 1999 the screening tests for infection diseases have been started and in 2000 started the process of donors selection, collection, storage and transportation. In 2010, the testing for infection diseases which can be transmitted by blood transfusions, were centralised at the National Blood Transfusional Center in Tirana [12].

Because of the "window period", even though the presence of infection is high, there's the risk that the antibodies cannot be yet detected [13,14]. This explains in part the high prevalence of viral hepatitis among the multi-transfused patients.

Recently, HCV viremia has been routinely detected by Polymerase Chain Reaction (PCR) and it permits the detection of HCV and HBV viruses during the "window period" [15,16,17]

Due to limited financial resources available in our medical health system, the tests performed in routine for the screening process of the blood donors are only HBsAg and anti HCV serological testing.

5. Conclusions

Prevalence of viral hepatitis as HCV, HBV is higher among the multi-transfused thalassaemia patients. It depends on the number of transfusions and the screening process of the blood donors. As actually, HBsAg and anti HCV serological testing are the only routine tests used for screening the blood donors, the high risk of prevalence of viral hepatitis will be present.

6. Future Scope

Vaccination against HBV and the process of screening for the blood donors, especially with more accurate laboratory testing prior to transfusion, are of great importance for prevention of these infections among multi-transfused thalassaemia patients.

References

[1] Poynard T, Bedossa P, Opolon P et al. Natural history of liver fibrosis progression in patients with chronic hepatitis C. Lancet 1997; 349: 825–832.
[2] Tong MJ, el-Farra NS, Reikes AR et al. Clinical outcomes after transfusion-associated hepatitis C. N Engl J Med 1995; 332: 1463–1466.
[3] Detre KM, Belle SH, Lombardo M. Liver transplantation for chronic viral hepatitis. Viral Hep Rev 1997; 2: 219–228
[4] Global Disease Burden
[5] Din G, Maliks S, Ali I, Ahmed S, Dasti JI.Prevalence of hepatitis C virus infection among thalassemia patients: a perspective from a multi-ethnic population of Pakistan. Asian Pac J Trop Med. 2014 Sep;7S1:S127-33
[6] WHO: Hepatitis C. Fact sheet No.164 (April 2014)
[7] NIH. NIH Consensus State Sci Statements. 2002;19:1-46. 3. Mühlberger N, et al. BMC Public Health. 2009;9:3
[8] Hepatitis C. Global status-2017 edition.
[9] Lavanchy D. The global burden of hepatitis C. Liver Int. 2009; 29: 74–81pp.
[10] Mathers B, Degenhardt L, Phillips B, Wiessing L, Hickman M, Strathdee S, et al. Global epidemiology of injecting drug use and HIV among people who inject drugs: Lancet. 2008; 372: 1733–1745pp.
[11] Mei-Hsuan Lee, Hwai-I Yang, Yong Yuan, Gilbert L'Italien, Chien-Jen Chen. Epidemiology and natural history of hepatitis C virus infection. World J Gastroenterol 2014; July 28: 20(28): 9270- 9280pp.
[12] Durro V, Koraqi A, Saliasi S. Trends in the prevalence of transfusion-transmissible infections among blood donors In Albania. Journal Of Clinical Laboratory. 2010, vol 56(No.11+12); pg. 591-595.(PMID:21141446).
[13] Williams AE, Thomson RA, Schreiber GB, Watanabe K, Bethel J, Lo A, Kleinman SH, Hollingsworth CG, Nemo GJ. Estimates of infectious disease risk factors in US blood donors. Retrovirus Epidemiology Donor Study. JAMA. 1997 Mar 26;277(12):967-72.
[14] J Barbara, Flanagan P. (1998). Blood transfusion risk: protecting against the unknown. BMJ 316 (7133), 717-718.
[15] Bukh J1, Wantzin P, Krogsgaard K, Knudsen F, Purcell RH, Miller RH. High prevalence of hepatitis C virus (HCV) RNA in dialysis patients: failure of commercially available antibody tests to identify a significant number of patients with HCV infection. Copenhagen Dialysis HCV Study Group. J Infect Dis. 1993 Dec;168(6):1343-8
[16] Schneeberger PM, Keur I, van der Vliet W, van Hoek K, Boswijk H, van Loon AM, van Dijk WC, Kauffmann RH, Quint W, van Doorn LJ. Hepatitis C virus infections in dialysis centers in The Netherlands: a national survey by serological and molecular methods. J Clin Microbiol. 1998 Jun;36(6):1711-5.
[17] Izopet J, Rostaing L, Sandres K, Cisterne JM, Pasquier C, Rumeau JL, Duffaut M, Durand D, Puel J. Longitudinal analysis of hepatitis C virus replication and liver fibrosis progression in renal transplant recipients. J Infect Dis. 2000 Mar;181(3):852-8.
[18] Miller CL1, Johnston C, Spittal PM, Li K, Laliberté N, Montaner JS, Schechter MT. Opportunities for prevention: hepatitis C prevalence and incidence in a cohort of young injection drug users. Hepatology. 2002 Sep;36(3):737-42.

Author Profile

Dr. Pranvera Doçi, graduated in 2010 in the Faculty of Medicine and Surgery at the Catholic University "Our Lady of Good Counsel", by presenting a thesis on "The Prevalence and Characteristics of Metabolic Syndrome among Apparently Healthy Adults in Albania". In 2011 she started her specialization at the University Hospital Centre "Mother Teresa", in Albania and became an Internal Medicine specialist in 2015. She began her PhD project on 2013, researching in "Epidemiology and molecular characteristics of the Hepatitis C virus (HCV) in Albania". In 2016 she carried out an internship at the Laboratory of Infectious Diseases, "Luigi Sacco" Hospital, Italy. From November 2015, she started working at the Department of Biomedical Sciences, Catholic University "Our Lady of Good Counsel" and teaches Physiology, Internal Medicine and Geriatrics. She also coordinates the Course of Medicine and Surgery at the homonym University