

Economic and social factors fighting against hepatitis B and C contagion

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Abstract: Socioeconomic factors may influence the epidemiology of viral hepatitis. We present the results of an ongoing prospective study which included a number of 56 patients. Sixty-two percent of them came from urban areas and 50% came from medium income families. Ninety percent of the children were in school and most parents were educated up to secondary school. A significant percentage of families did not have appropriate indoor toilet and plumbing facilities. Systematic prevention methods should be available and the awareness level needs to be raised in order to fight contagion and lower the incidence of chronic viral hepatitis in Romania.

Keywords: chronic viral hepatitis, children, socioeconomic, contagion

JEL Classification: I15, I18

Introduction

Chronic viral hepatitis is defined by clinical signs, biochemical markers and histological findings suggesting hepatocellular inflammation, persistent over a period of at least 6 months. The main etiologies of chronic hepatitis are viral B and C infections. Chronic viral hepatitis is one of the most common infectious diseases worldwide, causing disability and mortality, being considered an important public health issue. This infection in children results in a significant burden on the economy and health system of the affected countries.

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Nowadays, the incidence and prevalence of chronic hepatitis B and C are higher in developing countries than in the developed ones. The lower quality of life and level of wellbeing can be held responsible for this.

Considering the extent of the issue worldwide, effective management of the disease is needed in order to reduce the spread and consequently the burden of the disease. This goal can be achieved by applying the known preventive strategies, and also by correctly treating infected patients in order to lower the transmission (avoid the negative externalities generated by the infected individual). Thus, the prophylaxis of the viral hepatitis is important not only from a medical point of view, but also from an economical and social one.

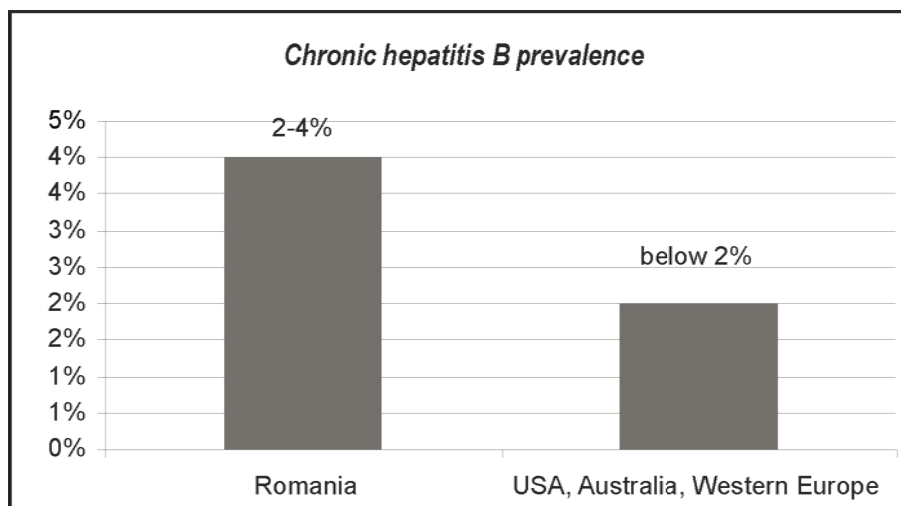
The present paper focuses on specific aspects regarding the epidemiology, prophylaxis and treatment of chronic hepatitis B and C: prevention methods applied, incidence and prevalence of the disease in Romania as compared to other countries.

We present the results of an ongoing prospective study which aimed to evaluate the socio-economic characteristics of Romanian pediatric patients with chronic hepatitis B and C. Socio-economic factors may have an important contribution to contagion, considering that incidence and prevalence are higher in our country as compared to developed and emergent economies.

Literature data

Approximately 45% of the world's population lives in highly endemic areas for hepatitis B. This state of fact results in a 60% risk of infection throughout life. Only 12% live in low prevalence areas (below 1% – The United States of America, Australia and Western Europe), where the risk of infection throughout life is less than 20%. In Romania, The Centers of Disease Control and Prevention report a prevalence of 2-4% and the World Health Organization of 1-7%, which puts the population at a risk of infection varying from 20 to 60% (Hwang E., 2011; Lemoine M., 2014). Worldwide, 2 billion people (1/3 of the Earth population) have contacted the hepatitis B virus, out of which 360 million are chronically infected and are at risk of developing liver pathology associated to chronic hepatitis B infection (Hwang E., 2011). Fifteen million of them are also infected with the hepatitis D virus (Lemoine M., 2014). According to the Centers of Disease Control and Prevention, in 2012 antigen HBs (hepatitis B infection marker) prevalence was high (above 8%) in Western Africa and intermediate-high (5-7%) in many African and Asian countries. At the same time, Romania was known to have an intermediate-low Ag HBs prevalence (2-4%).

Figure 1: Hepatitis B prevalence (estimated data)



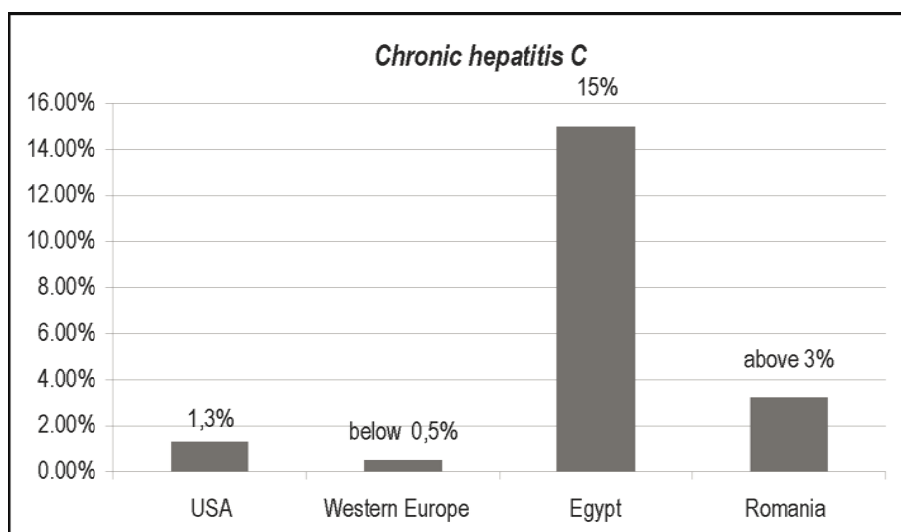
Source: Own research results based on primary data of Centers of Disease Control and Prevention and World Health Organization.

Chronic hepatitis C generates high morbidity and mortality as well. Worldwide, 130-170 million people are infected with the hepatitis C virus. Estimated global prevalence is 2-3% (Ansaldi F., 2014). The World Health Organization estimates that 3-4 million people are infected with hepatitis C virus each year (Shepard C., 2005). Fifty to eighty-five percent of the people infected develop chronic disease (El-Shabrawi M.H., 2013). Approximately 40000 – 60000 children are born to hepatitis C virus infected mothers annually (El-Shabrawi M.H., 2013; Cottrell E.B., 2013).

Chronic hepatitis C is highly endemic in African as well as in Asian countries and has a low prevalence in North America, Western Europe and Australia. Egypt has the highest reported prevalence of virus C infection (15%). In the pediatric population the lowest rate of the disease (0.05-0.36%) is found in the United States and in Western and Northern Europe, while in the developing countries the reported prevalence ranges from 1.8 to 5.8%. The highest prevalence is in Egypt, Sub-Saharan Africa and Mongolia (Kretzer I.F., 2014; El-Shabrawi M.H., 2013). Epidemiological data is less known in developing countries, but chronic hepatitis C infection rates are estimated to be high and the surveillance possibilities are limited. Eastern European countries (including Romania) are considered to have a high intermediary prevalence of the infection, above 3%

(Ansaldi F., 2014; Kretzer I.F., 2014; Shepard C., 2005). Romania has the highest prevalence of chronic hepatitis C in Europe (3.23%), and only 1% of the infected people receive adequate treatment (IFPMA, 2014).

Figure 2: Chronic Hepatitis C incidence worldwide (estimated data)



Source: Own research results based on primary data from Kretzer IF, do Livramento A, da Cunha J, Gonçalves S, Tosin I, Spada C, Treitinger A (2014): **Hepatitis C** worldwide and in Brazil: silent epidemic—data on disease including incidence, transmission, prevention, and treatment., *ScientificWorldJournal*. 2014; 2014:827849.

Global estimates show that 57% of the cases of cirrhosis and 78% of the cases of hepatocellular carcinoma are due to hepatitis B and C viruses. Cirrhosis and hepatocellular carcinoma are responsible for 2.5% of deaths worldwide (Perz J., 2006).

Literature review – points of interest

In 2012 the World Health Organization presented its global action framework, regarding the prevention and control for viral hepatitis infection. Three main goals were established: to reduce transmission of the agents that cause viral hepatitis, to reduce morbidity and mortality due to viral hepatitis and improve the care of

patients with viral hepatitis, and to reduce the socio-economic impact of the disease (WHO, 2012). In order to achieve these goals, the WHO recommended four axes for the management of chronic viral hepatitis (IFPMA, 2014) (Figure 1).

Figure 3: The four axes of the WHO global framework on viral hepatitis



Source: International Federation of Pharmaceutical Manufacturers & Associations, 2014.

The lack of knowledge and awareness both in the general population and the population at risk and among the healthcare providers is impeding the efforts of preventing and controlling hepatitis B and C spread. This is why educational programs should be promoted in order to insure better understanding of infections, transmission, prevention and treatment (Mitchell A., 2010).

One of the indicators of sustainable development targets physical access to primary health care services, including preventative, curative and palliative care for communicable diseases and routine immunizations. These, among others, are important elements in ensuring health and wellbeing (WHO, 2009). A good surveillance system is also needed in order to produce evidence-based and cost-effective policies and plans. Guidelines and standards for surveillance need to be finalized in order to prioritize resources and different interventions – immunization, antiviral therapy, screening the blood supply, ensuring safe healthcare environments and practices (WHO, 2012).

The high prevalence of the hepatitis C virus in underdeveloped and developing countries points towards the lack of economic resources needed to implement

prevention policies, thus generating a rising incidence for chronic viral hepatitis. Management of long-term consequences is also impaired by the lack of economic support. Access to medical care should be improved, not only physical but also economic, social and cultural access has to be provided (U.N., 2007).

The immunization program is considered to be an important part of the prevention plan. The impossibility of developing a vaccine (because of its great variability and its multiple strains) is the main impediment in eradicating hepatitis C (El-Shabrawi M.H., 2013). The lack of an efficient vaccine against the hepatitis C virus enforces the role of preventive measures in order to reduce the prevalence of infection with this virus. Primary prevention measures can reduce or eliminate the potential risk of HCV transmission while secondary ones can reduce the risk of chronic disease by identifying HCV-infected individuals and providing appropriate medical management and antiviral therapy (Iancu L.S., 2001). Patients with chronic hepatitis C must be counseled regarding transmission routes in order to reduce the spread of the infection. They should also be informed regarding the appropriate measures for reducing the risk of developing long-term complications of the disease. They have to seek medical care for evaluation and specific treatment (El-Shabrawi M.H., 2013). Perinatal transmission is the leading cause of the hepatitis C virus infection in the pediatric population. No known measures have proven effective in reducing mother to infant rate of transmission (Cottrell E.B., 2013).

For the hepatitis B virus the main preventive strategies include vaccination along with prenatal screening and postpartum prophylaxis in selected cases. The World Health Organization does not recommend prenatal screening in all regions because it is considered not to be feasible in resource-poor countries. In intermediary or high prevalence areas, a good immunization coverage not associated with prenatal screening still offers good cost-effectiveness ratios, even though the protection rate of perinatal mother-to-infant transmission after all 3 doses of vaccine is 70-80%. The protection rate rises to 95% when the infant receives specific Immunoglobulin in the first 24 hours of life (Komatsu H, 2014; WHO, 2009). An important goal of sustainable development regards the percentage of children receiving full immunization – including the Hepatitis B vaccine (WHO, 2009). An efficient management of the national program for immunization may have an important impact on reducing morbidity and mortality secondary to childhood infectious diseases. In 2012 immunization coverage for hepatitis B virus was 79% (Komatsu H, 2014). The European Centre of Disease Prevention and Control reported in 2010 an immunization coverage of 98% among newborns and 97% among adolescents (ECDPC, 2010). Modern

therapeutic guidelines must be implemented and efficient antiviral medication and sensitive diagnosis methods need to be used for hepatitis B (Holban T., 2008).

In 2014 Stahmeyer pointed that the high costs of chronic hepatitis C management in Germany are secondary to long-term antiviral treatment. This is why eradication of the infection or early diagnosis and treatment could save important resources (Stahmeyer JT, 2014). It is estimated that in 10 years 26 million dollars will be spent on screening, 117-206 million dollars on monitoring and 56-104 million dollars for treatment and the total cost would be 199-366 million dollars (El-Shabrawi M.H., 2013).

Socioeconomic characteristics of children with chronic viral hepatitis from South-Eastern Romania

The study aimed to evaluate the socioeconomic characteristics of patients with chronic hepatitis B and C evaluated in the Paediatrics Department of "Grigore Alexandrescu" Emergency Children's Hospital in Bucharest, Romania. The idea of the study originated in the fact that social and economic factors may play an important role in hepatitis B and C contagion pattern.

From July 2014 to February 2015 a number of 56 patients were included in the study. Out of them, 45 were diagnosed with chronic hepatitis B, out of which 3 also had hepatitis D virus infection, and 11 with chronic hepatitis C. Questionnaires were applied to the patients' families in order to establish their socio-economic status. We analyzed demographic data, income, parents' education, access to primary medical care and household facilities in order to establish the patients' living standard.

The results showed that the median age in the study group was 10.26 years. The sex ratio was female/male = 1.07/1. Sixty two percent of the patients came from urban areas, the urban to rural ratio being 1.66/1.

According to the World Bank, Romania is considered an upper medium income country with an average medium wage of 1552 RON (equivalent of 350 Euro/month). Fifty percent of the patients came from families with an income ranging from 1000 to 2000 RON/month (the equivalent of 220 to 440 Euro).

Regarding the level of education, 90% of the children included were in school. Five percent of the others were below school age, and 5% were above school age but were not in school. The children's parents received a mean of 10.6 years of education.

A significant percentage of families (32%) did not have appropriate indoor toilet and plumbing facilities. On average 4.6 persons inhabited the house and the mean number of people/houseroom was 2.

Conclusions

Theoretical and Methodological approaches

According to the results of our research, there seems to be a direct connection between the incidence of chronic hepatitis B and C and the level of education, income and the living conditions of the population.

Considering the high incidence of chronic hepatitis B and C in Romania, it appears that raising educational attainment in both children and parents may improve the situation. Early education is an effective tool in both preventing and fighting hepatitis B and C contagion, which can result in increased wellbeing and a better quality of life. Economic and financial resources of patients and families appear to be important factors as well – the higher the education level and income, the lower the incidence of the disease.

Prevention methods are available, both basic and more complex ones. Primary prevention measures against hepatitis B and C (which aim to reduce the incidence of the disease) are highly available and cheaper in comparison to treatment options and tertiary prevention methods (which focus on reducing or minimizing the consequences of the disease once it develops). Access to knowledge is an important factor in fighting contagion and is mainly influenced by the level of education and economic resources. School and media channels could be used in order to inform population and provide access to knowledge for the general population.

Practical remarks

Access to medical care has to be improved. Primary care physicians should be involved in educating the population. Vaccines for hepatitis B are available through the Romanian immunization programme and are distributed through primary medical care facilities. Prenatal screening for hepatitis B infection must be performed and vaccination along with postpartum prophylaxis should be applied for selected cases. Basic prevention methods have to be promoted in order to limit the spread of the infection, both for hepatitis B and C. Families of the affected individuals need to be screened for the infection, as well as other people who inhabit the household.

Diagnosis of already infected individuals has to be rapidly established (secondary prevention) and effective treatment must be initiated as soon as possible (tertiary prevention) in order to reduce negative externalities – limit the spread of the disease (contagion), avoid additional costs for treatment and medication and maintain healthy labour force and high labour productivity. Epidemiological surveillance of the infection is also needed.

There still is need for research in developing new strategies meant to overcome the anti-vaccine movement, resulting in major disruptions in immunization programs, causing morbidity and mortality, promoting contagion and hampering hepatitis B eradication. Important fundamental breakthrough is required for hepatitis C vaccine development in order to achieve eradication of the disease.

An interesting new direction of research must focus on realizing a comparative costs/benefits estimation of both prevention and treatment of chronic hepatitis B and C. However, some empirical and not very rigorous calculations suggest that prevention costs are at least a few times lower than treatment costs. In order to obtain more relevant results regarding costs and benefits of prevention, respectively treatment, further efforts are needed for all stakeholders or involved players.

Although eradication is desirable, the more realistic target is reduction of disease proportions to the lowest or at least "optimal levels", which depend on the specifics concerning the area and level of economic and social development.

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