Bulletin of the *Transilvania* University of Braşov – Special Issue
Series VII: Social Sciences • Law • Vol. 12 (61) – 2019
https://doi.org/10.31926/but.ssl.2019.12.61.3.2

ETHICS AND BENEFITS OF VACCINATION BETWEEN THEORY AND PRACTICE

M.-E. COCUZ[1] I.-G. COCUZ[2]

Abstract: *In this short paper we intend to examine Hepatitis B, infection of the liver produced by the hepatic B virus (HBV), which is nowadays a major public health problem on earth, because of the high number of infected people, which are sources of infection for those around them and because of the multiple transmission possibilities of the virus. The objective of this study is to dynamic analyze some of the epidemiological aspects of acute viral hepatitis B, admitted in the Clinical Infectious Diseases Hospital of Brasov in accordance to the recommendations of vaccination against hepatitis B in the Annual Vaccination Schedule since 1990 and numerous campaigns of pro-vaccination made by health professionals for promoting the fact that the specific vaccination is the only method of preventing the infections and the campaigns against vaccination made by people outside the medical field about concerns or refuses of vaccination because of association with other morbid states.*

Key words: *vaccination, Hepatitis B, preventing the infections, treatment.*

1. Introduction

Hepatitis B, infection of the liver produced by the hepatic B virus (HBV), is nowadays a major public health problem on earth, because of the high number of infected people, which are sources of infection for those around them and because of the multiple transmission possibilities of the virus. (https://www.who.int/immunization/diseases/hepatitisB/en/https://www.ncbi.nlm.nih.gov/pubmed/7795104)

World epidemiological surveillance data shows that an estimated number of 780000 persons die due the complications of the chronic infection with hepatic B virus (HBV) like liver cirrhosis and hepatic cancer. (https://www.who.int/immunization/diseases/hepatitisB/en/).

[1] *Transilvania* University of Braşov, maria.cocuz@unitbv.ro
[2] Faculty of Medicine, University of Medicine, Pharmacy, Sciences and Technology of Targu Mures, iuliuco@gmail.com

The infection with hepatic B virus (HBV) is spread all over the world; based on the evaluation of surface antigen HBs in general population, it is estimated that in 1995 over 2 billion people on earth were or the have been infected with virus B. (World Health Organization. Hepatitis B vaccines: WHO position paper, July 2017; Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection World Health Organization, Geneva, 2015; Kane M. (1995, p. 47-9).

In 2015, global prevalence of the infection with hepatic B virus (HBV) was evaluated at 3.5%, approximately 257 million people having chronic infection (Global Hepatitis Report, World Health Organization, Geneva, 2017) and the deaths number of global infections with hepatic B virus (HBV) was evaluated at 887000 from which 337000 were hepatic cancer, 462000 were liver cirrhosis and 87000 were acute hepatitis. (http://www.who.int/entity/healthinfo/global_burden_disease/GHE2015_Deaths_Global_2000_2015.xls?ua=1).

People with chronic infection with hepatic B virus (HBV) are at risk for severe liver disease and death, and also, they are sources of infection and can transmit the infection to other receptive people around them (Jones, E., Edmunds, J., 2016). The transmission of the hepatic B virus (HBV) can be made in multiple ways, manly by mucosal contact or percutaneous, by contaminated blood or other body fluids (saliva, genital secretions), medical contaminated instruments (needles, syringes, etc.) or non-medical (needles used to inject different drugs, needles for tattoos, scissors or razors). Another way for infection transmission is the vertical transmission path, from the pregnant women to the newborn during pregnancy or birth (Wong V.C., Reesink HW, Lelie, P.N., Reerink-Brongers, E.E., Yeung CY, Ma HK, 1984 Apr 28;1(8383):921-6). After the infection, evolution is towards acute hepatitis (which sometimes can evolve with sever forms of the disease, in 0.5-1% could go even to death) or, chronic infection (chronic hepatitis, liver cirrhosis or hepatic cancer with hepatic B virus (HBV). The acute infection is found in 1% of perinatal infections, in 10% of 1-5 years old children infections, and up to 30% of children over 5 years old (World Health Organization. Hepatitis B vaccines, 2017). The data from the literature says that 80-90% of the infected infants in the first year of life and 30-50% of children which acquire the infection before the age of 6 will have chronic hepatitis; 5% of the adults infected with hepatic B virus (HBV) will develop chronic infections, and from those 20-30% will have liver cirrhosis and hepatic cancer (Shimakawa Y. et al., 2015, p. 2318–2326; Ropero Álvarez A.M. et al., 2017, p.325). Patients infected with a form of hepatic B virus (HBV) can become infected up to 5% (simultaneous or after) with hepatic virus D, situation which aggravates the evolution of both infections (Kane, M., 1995).

In terms of treatment, there is no specific treatment for acute infection, but only the chronic infection with hepatic B virus. The treatment is not curative, does not cure the infection, it just maintains the viral suppression and it is necessary to be made for the rest of your life (https://www.who.int/immunization/diseases/hepatitisB/en/; World Health Organization. Hepatitis B vaccines: WHO position paper, July 2017 - Recommendations. Vaccine. 2019 Jan 7).

The prevention of infection with hepatic B virus (HBV) and her serious consequences on personal health can be made most efficient with specific vaccination (https://www.who.int/immunization/diseases/hepatitisB/en/, Ropero Álvarez, A.M., Pérez-Vilar, S., Pacis-Tirso, C. et al., 2017).

Vaccination is a rational method of prevention of some infectious disease, with favorable consequences and human lives saved (https://www.medichub.ro/reviste/pediatru-ro/vaccinurile-si-vaccinarea-certitudini-si-provocari-id-545-cmsid-64). Also, vaccination and immunization of a big part of population can decrease the risk of infection on receptive persons around infected ones by a lower number of infection sources (https://www.medichub.ro/reviste/pediatru-ro/vaccinurile-si-vaccinarea-certitudini-si-provocari-id-545-cmsid-64).

Extensive vaccination has led to the fact that in 2015 the vaccination with 3 doses of Hepatitis B vaccine in the childhood reached 84% and the proportion of infected children under 5 years old to decrease from 4.7% to 1.3% between the moment of introducing the vaccination (1980-2000) and 2015 (World Health Organization. Hepatitis B vaccines: WHO position paper, July 2017 - Recommendations. Vaccine. 2019 Jan 7;37(2):223-225; http://apps.who.int/iris/bitstream/10665/255016/1/9789241565455-eng.pdf?ua=1).

Nowadays, there can be found vaccination doses for children (recommended at birth) and also for adults and there are established clearly immunizations schemes. In Romania, children immunization for Hepatitis B is made according to the Annual Schedule of Vaccination (https://cnscbt.ro/index.php/calendarul-national-de-vaccinare). The vaccine for Hepatitis B is a save and efficient vaccine, recommended for newborns, children and adults. There was no evidence for a causality effect between vaccination for Hepatitis B and develop of some diseases like autism, multiple sclerosis or other neurological diseases (www.hepb.org/prevention-and-diagnosis/vaccination/). The vaccine for hepatitis B is considered in present the first vaccine for against cancer because it indirectly prevents hepatic cancer, consequence of the chronic infection with hepatic B virus (HBV) (www.hepb.org/prevention-and-diagnosis/vaccination/). In terms of ethics aspects about vaccination against Hepatitis B, there are opinions which say that if a disease with sever evolution potential can be prevented, then people with a potential risk of infection should be protected (Dawson AJ., 2005). Also, from the perspective of the best interest for children, the risk of transmission of the infection from the infected mother to the newborn or in the childhood justifies the application of child protection measures like vaccination (Isaacs, D., Kilham, H.A., 2011). On the other hand, the decisions of vaccination should consider the ethic aspects, informed, correct and transparent dialogue with education propose, especially nowadays when the parent's resistance to the idea of children vaccination is increasing, the vaccination being essential for the success of prevention actions of getting infected with hepatic B virus (HBV) (Schwartz, J.L, Caplan, AL., 2011 oct and dec).

2. Objectives

The objective of this study is to dynamic analyze some of the epidemiological aspects of acute viral hepatitis B, admitted in the Clinical Infectious Diseases Hospital of Brasov in accordance to the recommendations of vaccination against hepatitis B in the Annual Vaccination Schedule since 1990 and numerous campaigns of pro-vaccination made by health professionals for promoting the fact that the specific vaccination is the only method of preventing the infections and the campaigns against vaccination made by people outside the medical field about concerns or refuses of vaccination because of association with other morbid states.

3. Material and methods

We realised an observational, retrospective study, conducted over a period of 11 years (2008-2018) on the casuistry of the Clinical Hospital of Infectious Diseases from Brasov –adult and children patients admitted with Acute Viral Hepatitis with Hepatic B virus (HBV). We analyzed: the dynamic of admissions and the admissions frequency comparatively in adults and children and on age groups in adults. The study was conducted on the basis of written consent of patients to participate in didactic and research activities.

4. Results and discussions

In 2008-2018 there were admitted 99 patients with Acute Viral Hepatitis with Hepatic B virus (HBV), from which 92 were adults and only 7 where children. (Figures 1 and 2)

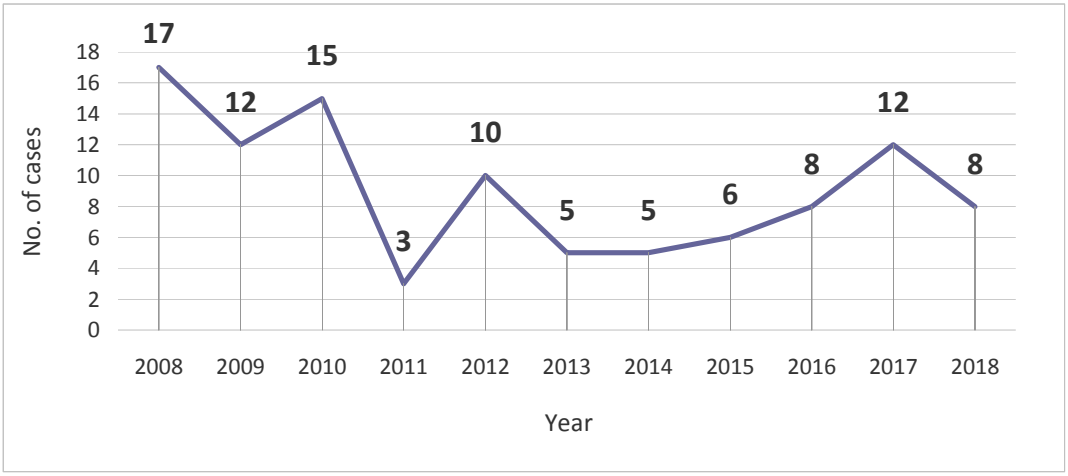

Fig. 1. *The dynamics of admissions for acute hepatitis B*
(Clinical Infectious Diseases Hospital of Brasov, 2008-2018)

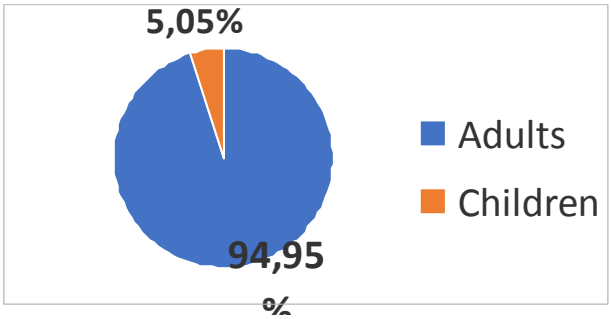

Fig. 2. *Frequency of admissions for acute hepatitis B adults/children*
(Clinical Infectious Diseases Hospital of Brasov, 2008-2018)

We can see that admissions for Acute Viral Hepatitis with Hepatic B virus (HBV) were not numerous but they were present in every year of the study and presents a slight downward trend, from 17 cases in 2008 to 8 cases in 2018.

We can also observe a significant difference between the admissions of adults, which are predominant – 94.05% from the total admissions and the children – only 5.05% of cases. This finding is due to the fact that at leas for children, the specific vaccination against hepatitis B was correctly and constantly applied.

We have analyzed the dynamics of admissions for Acute Viral Hepatitis with Hepatic B virus (HBV) compared between adults and children (Figure 3):

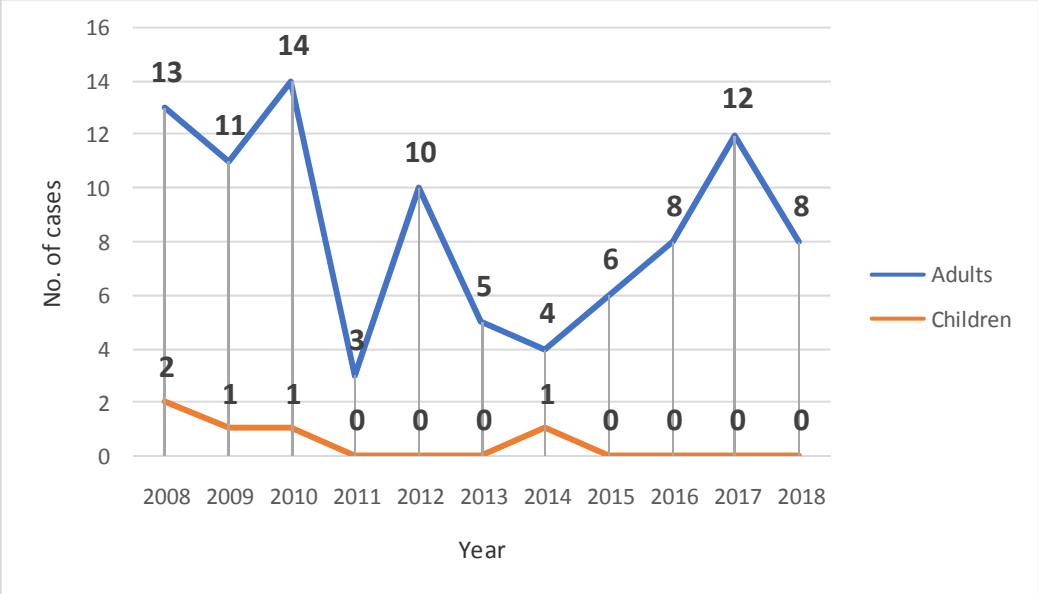

Fig. 3. *The dynamics of admissions for acute hepatitis B – adults/children* (Clinical Infectious Diseases Hospital of Brasov, 2008-2018)

The number of admitted children was very small over the all period of the study. We notice that admissions for children were only in 4 year – 2 cases in 2018 and on case in 2009, 2010 and 2014.

From 2015, there were no records for cases in children. Instead, the adult's admissions maintain.

The dynamics of admissions on age groups in adults is presented in Table 1 and Figure 4.

We notice admissions for Acute Viral Hepatitis with Hepatic B virus (HBV) at all age groups in adults. The littlest frequencies were observed in patients between 18-24 years old – 15.22% cases and over 55 years old – 14.13%. Also, in the last 7 years of the study period, there were no records of admissions for these age group. Teenagers and young adults are already part of the vaccinated at birth batch in the National Vaccination Program. The most affected age groups were the 35-44 years old – 28.26%, 25-34 years old – 21.74% cases and 45-54 years ol – 20.65% of cases, patients which probably have not benefited from the National Vaccination Program and neither other way of

prevention (http://www.cnscbt.ro/index.php/rapoarte-anuale/1003-analiza-evolutiei-bolilor-transmisibile-aflate-in-supraveghere-raport-pentru-anul-2017/file).

Table 1

Admissions for acute hepatitis B in adults by age groups (Clinical Infectious Diseases Hospital of Brasov, 2008-2018)

Year/Age groups	18-24	25-34	35-44	45-54	55-64	>=65
2008 (13)	5	4	1	1	2	-
2009 (11)	4	4	2	1	-	-
2010 (14)	3	3	5	3	-	-
2011 (3)	1	-	2	-	-	-
2012 (9)	-	3	3	1	-	1
2013 (5)	-	2	1	1	-	1
2014 (4)	-	1	2	-	-	1
2015 (5)	-	-	1	2	2	-
2016 (8)	-	1	5	1	1	-
2017 (12)	-	1	2	5	4	-
2018 (8)	-	1	2	4	1	-
Total (92)	14	20	26	19	10	3

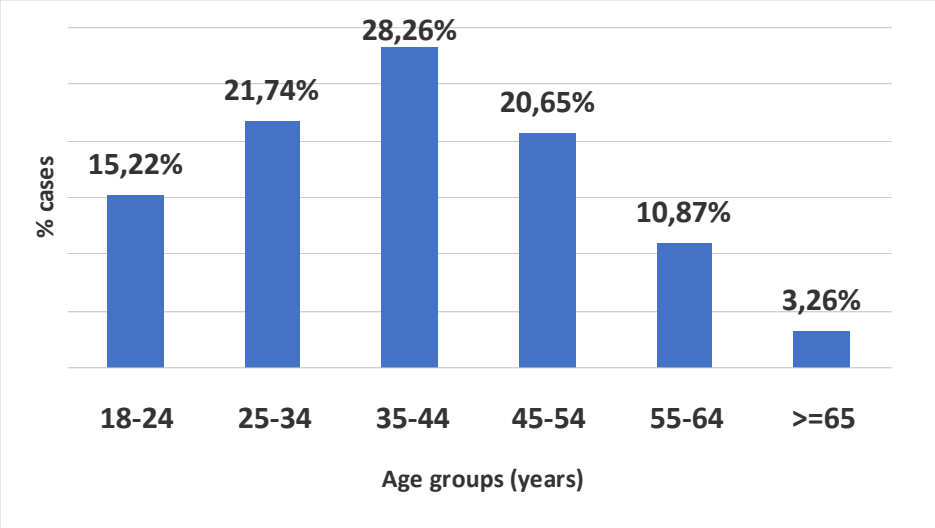

Fig. 4. *Frequency of admissions for acute hepatitis B in adults by age groups*

On national level, based on the 2017 report of the National Center of supervision and Transmissible Diseases Control, in 2017 a number of 133 cases of Acute Viral Hepatitis with Hepatic B virus (HBV) were registered, decreasing compared to last years. The most cases were reported to the 35-44 years old age group (38%), followed by the 45-54 years old age group, aspect observed also in our study. In the same period, there were registered 6 cases in children under 5 years old, non-vaccinated or incomplete vaccinated. It is also mentioned the constant decrease of the reported incidence of Viral Hepatitis B in 2006-2017, from 5.95%000 in 2006 to 0.69%000 in 2017, a constant

tendency also in our study (ecdc.europa.eu/en/publications-data/hepatitis-b-annual-epidemiological-report-2017.).

In Europe, ECDC shows in the 2017 report the fact that 30 countries from UE have reported 26907 cases of infection with Hepatic B Virus (HBV), from which 9% were acute infections and 58% chronic ones. The biggest frequency of acute infections was observed also in the 35-44 years old age group. A mention about the decrease of cases of acute infection is also mentioned in the ECDC report, situation which is considered in concordance with the global tendency and which is a marker of the efficiency of vaccination programs.

5. **Conclusions**

1. The annual count of admissions for Acute Viral Hepatitis with Hepatic B virus (HBV) in 2008-2018 was reduced and in a decreasing trend in the last years.
2. Admissions for Acute Viral Hepatitis with Hepatic B virus (HBV) have prevailed in adults, most of them over 34 years old, not vaccinated at birth or after.
3. The small number of admissions in children with a decreasing trend in hospitalization periods overall shows the major role of specific vaccination in preventing the Acute Viral Hepatitis with Hepatic B virus (HBV) disease.
4. Given the existence at present of an anti-vaccination attitudes in Romania we consider necessary actions for adequate and acurate information of the population in vaccination issues, in accordance with the principles of professional ethics, in order to ensure the health of the population.

References

Analiza evoluției bolilor transmisibile aflate în supraveghere. Raport pentru anul 2017 [Analysis of the evolution of communicable diseases under surveillance. Report for the year 2017]. Available at http://www.cnscbt.ro/index.php/rapoarte-anuale/1003-analiza-evolutiei-bolilor-transmisibile-aflate-in-supraveghere-raport-pentru-anul-2017/file.

Azoicai, D. (2015). *Vaccinurile şi vaccinarea. Certitudini şi provocări* [Vaccines and vaccination. Certifications and challenges]. Available at https://www.medichub.ro/reviste/pediatru-ro/vaccinurile-si-vaccinarea-certitudini-si-provocari-id-545-cmsid-64.

Calendarul National de Vaccinare [National Vaccination Calendar]. Available on https://cnscbt.ro/index.php/calendarul-national-de-vaccinare

Dawson, A.J. (2005). An ethical argument in favour of routine hepatitis B vaccination in very low-incidence countries. Lancet Infect Dis. Feb;5(2):120-5. Available at www.ncbi.nlm.nih.gov/pubmed/15680782.

Global Hepatitis Report, World Health Organization, Geneva, 2017. Available at http://apps.who.int/iris/bitstream/10665/255016/1/9789241565455-eng.pdf?ua=1

Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection World Health Organization, Geneva, 2015. Available at http://apps.who.int/iris/bitstream/10665/154590/1/9789241549059_eng.pdf

Hepatitis B - Annual Epidemiological Report for 2017. Available at ecdc.europa.eu/en/publications-data/hepatitis-b-annual-epidemiological-report-2017.

Hepatitis B Vaccination. Available at www.hepb.org/prevention-and-diagnosis/vaccination/

Hepatitis B. Available at https://www.who.int/immunization/diseases/hepatitisB/en/

Hepatitis B. Available at www.who.int/en/news-room/fact-sheets/detail/hepatitis-b

Hyams KC. Risks of chronicity following acute hepatitis B virus infection: a review. Clinical Infectious Diseases. 1995;20:992–1000. Available at https://www.ncbi.nlm.nih.gov/pubmed/7795104

Isaacs, D., Kilham, H.A., Alexander S, Wood N, Buckmaster A, Royle J. (2011) Ethical issues in preventing mother-to-child transmission of hepatitis B by immunisation. *Vaccine*. Aug 26;29(37):6159-62.

Jones, E., Edmunds, J. (2016). *Estimating the impact of HBV vaccination policies*, SAGE meeting October 2016, vaccination policies. Available at http://www.who.int/immunization/sage/meetings/2016/october/Session9-Estimating-the-impact-of-HBVvaccination-policies.pdf?ua=1

Kane, M. (1995). Global programme for control of hepatitis B infection. *Vaccine*. 13 Suppl 1:S47-9.

Ropero Álvarez, A.M., Pérez-Vilar, S., Pacis-Tirso, C. et al. (2017). Progress in vaccination towards hepatitis B control and elimination in the Region of the Americas. *BMC Public Health*. 17: 325.

Schwartz J.L., Caplan A.L. (2011). Ethics of vaccination programs. *Curr Opin Virol*. Oct;1(4):263-7. doi: 10.1016/j.coviro.,05.009

Schwartz, J.L, Caplan, A.L. (2011). Vaccination refusal: ethics, individual rights, and the common good. *Prim Care*. Dec;38(4):717-28, ix.

Shimakawa, Y. et al. (2015). Birth order and risk of hepatocellular carcinoma in chronic carriers of hepatitis B virus: a case-control study in The Gambia. *Liver Int.*, 35(10):2318–2326. Available at https://www.ncbi.nlm.nih.gov/pubmed/ 25728498.

WHO global health estimated for 2015 published in 2016 (Global Health Estimates 2015: deaths by cause, age, sex, by country and region, 2000–2015. Available at http://www.who.int/entity/healthinfo/global_burden_disease/GHE2015_Deaths_Global_2000_2015.xls?ua=1

Wong, V.C., Ip, H.M., Reesink, H.W., Lelie, P.N., Reerink-Brongers, E.E., Yeung, C.Y., Ma, H.K. (1984). Prevention of the HBsAg carrier state in newborn infants of mothers who are chronic carriers of HBsAg and HBeAg by administration of hepatitis-B vaccine and hepatitis-B immunoglobulin. Double-blind randomised placebo-controlled study. *Lancet*., Apr 28;1(8383):921-6.

World Health Organization. Hepatitis B vaccines: WHO position paper, July 2017 - Recommendations. Vaccine. 2019 Jan 7;37(2):223-225.