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Evaluating of the association of ABO blood groups, age and sex with chronic hepatitis B virus in Iraqi patients

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Abstract

Chronic hepatitis B virus causes many deaths worldwide in statistics every year. There are few studies and publications that show the relationship between different blood groups with chronic hepatitis B and C disease. The aim of the study is to find out the relationship between different host factors for infection from the same virus, as 80 samples were collected from the Digestive Diseases Center in Baghdad for people infected with hepatitis virus and 96 samples from healthy people who do not suffer From any disease from the blood bank during the period between April and August of 2018, and sufficient data were taken from patients related to age and gender, the distribution of eighty Chronic Viral Hepatitis B) blood groups were as follows: Group A, 18 (22.5%), B, 57 (32.5). %), AB, 5 (6.25%), O, 31 (38.75%)). 73 (91.25%) were Rh positive and 7 (8.75%) were Rh negative. In healthy blood donors, 20 (21.8%) were in group A, 31 (32.3%) were in group B, 7 (7.3%) were in group AB, 37 (38.6%) were in group O.87 (90.4) The results showed that most of the patients were males (62.5%), while the percentage of females was 37.5%. During the study, no significant difference was recorded between blood groups with chronic viral hepatitis. The number of infections was clearly increasing with the increase. The association of chronic viral hepatitis infection with blood types needs more numerous studies to obtain more results.

Introduction

Blumberg and his colleagues first discovered the hepatitis B virus (HBV) in 1965, while in cases of blood transfusion the link between HBV and acute hepatitis was identified in 1968 [1]. Earlier diagnostic studies were based on immunological and serological methods; however, the development of molecular-based methods has advanced the field of diagnosis after discovery of HBV particle and cloning HBV genome [2]. It has been then found that HBV infection is a major global health issue with a particular concern in Asia and Africa, it is estimated that more than 350 million people worldwide have been diagnosed with chronic liver disease type B [3]. According to the Global Health Estimates Hepatitis is one of the leading diseases in humans and causes death [4].

In 2013, it was estimated that 1.45 million individuals died from viral hepatitis due to acute hepatitis and hepatitis-related liver cancer and cirrhosis. Most deaths from hepatitis are

caused by HBV and HCV, causing chronic, lifelong infection that leads to progressive hepatic damage leading to cirrhosis and hepatocellular carcinoma [5]. The progression of chronic viral hepatitis may be symptomatic or without symptoms, and various studies conducted on a group of people have shown that hepatitis cannot be detected during the initial period of infection, unlike other viral infections, and it was also noted that T cells of the hepatitis virus B Responses have been shown to be significantly reduced [6,7].

In addition, many factors that have an effective role in eliminating the virus have been monitored; Among these factors, the age of the host and the state of the immune system are weak or in good condition. Hepatitis B infection can be eliminated among adults, who are usually more mature It has been shown that acute infection with hepatitis B virus induces CD4 + and CD8 + T responses along with increased production of interferon-gamma (IFN-γ), which is one of the most important cytokines that have an effective role in clearing the body of the virus as well as controlling infection and transmission of the virus. Chronic liver type B. For example, interleukin-10 (IL-10) and transforming growth factor-beta (TGF-β) are associated with persistent HBV infection and inability to eliminate the virus due to T-cell down-regulation [8,9].

Materials and Methods

1.1Patients and control

Within the time period from (June) to (October) 2018, they collected 80 patients (fifty males, thirty females) with chronic hepatitis B infection inside the Specialized Center for Hepatology and Digestive Diseases located in Baghdad. Following the WHO and European Association for the Study of the Liver (EASL) guidelines within the hepatitis B virus test (6,7). Accordingly, the diagnoses of -HBc IgM, -HBc IgG and -HbsAg (chronic hepatitis B) antibodies were established.96 control samples from healthy donors (58 male and 38 female) where antibody-bound serum status was negative, and statistical work.

1.2 Laboratory methods

About 2 ml of blood sample were collected in EDTA tubes which were obtained by 10 ml sterile disposable syringe from each individual and left for assessment of ABO blood groups and Rh factor Put only a drop of Anti-A on the left side of the slide, and only a drop of Anti-B on the right side of the slide, and one drop of anti –Rh was placed in the center of slide (ABO blood groups and Rh, Bio test ,UK) .Three Blood drops were obtained and placed one drop on each side of slide and a drop on center. Quickly each three positions mixed with a fresh wooden applicator stick. The slide was rocked gently back and forth. After two minutes, all three blood drops were observed for evidence of clumping.

Results and Discussion

1.1 Age and Gender of (CVHB) infection Patients

Age

The age mean ± SD (standard deviation) of hepatitis B virus (HBV) infection patients was 41.2 ± 13.7 years, while control had a higher age mean (43.2 ± 11.9 years). However, there was no significant difference between the two means (p = 0.208) (Figure 1).

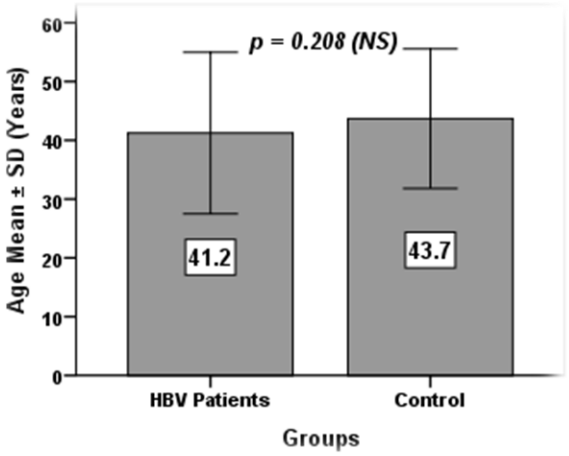

Figure 1: Mean age of CVHB infection patients and control.

Age groups

Distributing HBV patients into age group revealed that < 40-year age group had the highest frequency (40.0%), while the age group > 50 year recorded the lowest frequency (22.5%). Among control, aged 40-50 were the highest age group (46.9%), followed by the age group < 40 year (32.3%). The p-value of such differences was 0.432, which did not attend a significant level (Table 1).

Table 1: Age group frequency of CVHB infection patients and control.

Age Group (year)	HBV (N = 80)		Control (N = 96)	
	number	%	number	%
< 40	32	40.0	31	32.3
40 – 50	30	37.5	45	46.9
> 50	18	22.5	20	20.8
Statistical analysis	Pearson's χ^2 = 1.680; D.F. = 2; p = 0.432 (NS)			

D.F.: Degree of freedom

Gender

Most of HBV patients were males (62.5%), while female patients accounted for 37.5%. Almost approximated frequencies were reported in control (60.4 and 39.6%, respectively). There was no significant difference between patients and control regarding gender distribution (p = 0.777) (2).

Table 2: CVHB patients and control distributed according to gender.

Gender	HBV (N = 80)		Control (N = 96)	
	number	%	number	%
Male	50	62.5	58	60.4
Female	30	37.5	38	39.6
Statistical analysis	Pearson's χ^2 = 0.080; D.F. = 2; p = 0.777 (NS)			

NS: Not significant (p > 0.05).

Gender and Age

No significant difference between age means of HBV patients and control (p = 0.226) distributed according to gender. The age mean was 41.7 ± 14.6 year in male patients and 45.4 ±13.8 year in female control (2).

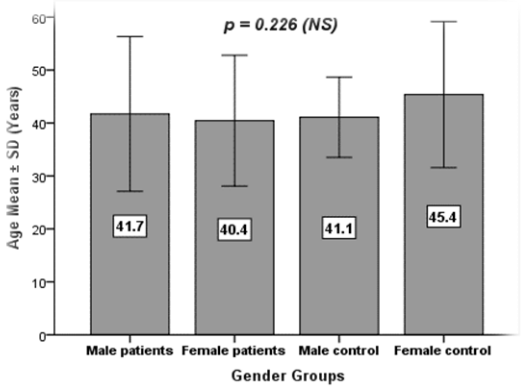

Figure 2: Hepatitis B virus infection patients and control distributed according to age and gender.

The results validated the matching between HBV patients and control in terms of age and gender. However, it was observed that individuals at the age range < 40 – 50 year were at a greater risk to be infected with HBV. In addition, males were also observed to have an increased risk to develop HBV infection. The male: female ratio was 1.7:1 among patients. Consistent with such observations, previous Iraqi studies also reported that most HBV patients was at the age less than 50 years, and male patients were more frequently observed than females (10-13]. In addition, Arabs, as well as other worldwide ethnicities, reported similar findings [14-17].

Accordingly, male gender and reproductive age might be considered as risk factors for HBV infection. In a recent study, the association between several sociodemographic and medical variables and HBV infection was examined in 80 HBV-infected patients and 96 healthy individuals. Among the sociodemographic parameters, higher age, being male, lower economic status, and Family history of hepatitis, dental treatment history, and hospitalization were further risk factors [18].

Table 3: Prevalence of CVHB in different age groups.

Blood group and Rh	HBV numbers	HBV percentage (%)	Blood donors numbers	Blood donors percentage (%)
A	18	22.5	21	21.8
B	26	32.5	31	32.3
AB	5	6.25	7	7.3
O	31	38.75	37	38.6
Rh positive	73	91.25	87	90.6
Rh negative	7	8.75	9	9.4
Total	80	100	96	100

Hepatitis B infection routes through exposure to blood or body fluids that contain blood. Less than 0.01 ml of these secretions can cause infection. ABO blood groups are one group of agglutinogens (antigens), which are carbohydrate-forming compounds that are determined by genes and present on the outer envelope of erythrocytes [19, 20]. It has long been noted that blood group antigens have a role in determining the relationship between disease and different groups [21,22], the type O blood group and its relationship with duodenitis, which

recorded double the infection number if compared with group A, B, while blood group A recorded the highest infection number within the tumors of the digestive system, on the other hand, compared with blood group O [23].

There are reports indicating Until thrombosis, high people with high cholesterol and heart disease are more common in people with blood type A than those with O [24]. In addition, there are other studies that indicated increased cholesterol and heart disease from infarction, hypertension and thrombosis are more common, assuring type A compared (24) Anti-A and B antibodies are not RBC antibodies but bacterial antibodies, they react with red blood cells. People without A or B antigens make either Anti-A or Anti-B at about three to six months when they make their own bacterial antibodies in utero. Numerous studies have been observed linking various infections with different blood groups. There are many reports linking different infections to a particular ABO blood group [25,26] Individuals with anti-A (group B and O) are more resistant to smallpox. Plasmodium vivax [27]. Therefore, the relationship between blood groups and various diseases is very wide. While other studies in patients with chronic hepatitis B have shown type B when comparing the relative frequency of ABO and Rh blood groups as well as healthy blood donors. There is no significant difference between blood groups, Rh and hepatitis. The study also showed the frequency of HBsAg in different ABO blood groups. It is higher within O in healthy subjects and in combination with this, blood group AB is significantly higher in the control group. Continuous testing must be done to help in the early detection of cases and vaccination for the ages most at risk, which in turn provides information and monitored data in order to be able to identify diseases and their spread.

Conclusion

The study reached the following conclusions: The chronic HBV infection tended to be more prevalent in males than in females. No significant differences were observed between blood groups with chronic viral hepatitis. In addition, it was noted that infection with the virus is more with increasing age.

References

1-Alodini, A. Q. (2012). Prevalence of Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) infections among blood donors at Al-Thawra Hospital Sana'a City-Yemen. Yemeni Journal for Medical Sciences, **6**:16-20.

2- Hu, J. (2016). Hepatitis B virus virology and replication Hepatitis B Virus, *in Human Diseases*: Springer International Publishing Switzerland, (1-34)

3- Zoulim, F, Testoni, B, & Lebossé, F. (2013). Kinetics of intrahepatic covalently closed circular DNA and serum hepatitis B surface antigen during antiviral therapy for chronic hepatitis B: lessons from experimental and clinical studies. *Clinical Gastroenterology and Hepatology,* **11**:1011-1013.

4- WHO, 2017a. Global hepatitis report

5- Petruzziello, A., 2018. Epidemiology of Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) Related Hepatocellular Carcinoma. Open *Virol. J.* **12**: 26–32.

6- Li, H.-J, Zhai, N.-C,Song, H.-X, Yang, Y, Cui, A., Li, T.-Y, Tu, Z.-K.(2015|) The Role of Immune Cells in Chronic HBV Infection,*J. Clin. Transl. Hepatol.* ,**3**:277–283.

7- Peeridogaheh, H, Meshkat, Z, Habibzadeh, S, Arzanlou, M., Shahi, J.M,Rostami, S,Gerayli, S, Teimourpour, R, (2018) Current concepts on immunopathogenesis of hepatitis B virus infection. Virus Res. 245, 29–43.']

8- Sandhu, P,Haque, M, Humphries-Bickley, T, Ravi, S,Song, J.(2017)Hepatitis B Virus Immunopathology, Model Systems, and Current Therapies. *Front. Immunol.* **8:** 436.

9- Maini, M.K., Pallett, L.J., 2018. Defective T-cell immunity in hepatitis B virus infection: why therapeutic vaccination needs a helping hand. *Lancet Gastroenterol. Hepatol.***3**:192–202.
10. Tarky, A.M., Akram, W., Al-Naaimi, A.S., Omer, A.R., 2013. Epidemiology of viral hepatitis B and C in Iraq: a national survey 2005-2006. Zanco *J Med Sci* **17**: 370–380.
11-Al-Rubaye, A , Tariq, Z, Alrubaiy, L(2016) Prevalence of hepatitis B seromarkers and hepatitis C antibodies in blood donors in Basra, Iraq. BMJ open Gastroenterol. 3:1-4**.**
12-Merza, M.A.(2017)Characteristics of Chronic Hepatitis B Virus Patients Related Liver Cirrhosis in a Tertiary Care Referral Hospital, Duhok, Iraqi Kurdistan. J. *Gastroenterol. Pancreatol. Liver Disord.*, **4:** 1–5.
13-Hussein, N.(2018)Risk factors of hepatitis B virus infection among blood donors in Duhok city, Kurdistan Region, Iraq. Casp. *J. Intern. Med.* ,**9**: 22–26.
14-Khan, F., Shams, S., Qureshi, I.D., Israr, M., Khan, H., Sarwar, M.T., Ilyas, M., (2011). Hepatitis B virus infection among different sex and age groups in Pakistani Punjab. *Virol. J.* **8:** 218-225**.**
15-Baha, W, Foullous, A, Dersi, N, They-They, T.P, Alaoui, K. El, Nourichafi, N, Oukkache, B., Lazar, F., Benjelloun, S, Ennaji, M.M, Elmalki, A, Mifdal, H,Bennani, A(2013) Prevalence and risk factors of hepatitis B and C virus infections among the general population and blood donors in Morocco. BMC Public Health, **13**: 1–8.
16-Al Romaihi, H.E, Ganesan, N, Farag, E.A, Smatti, M.K., Nasrallah, G.K., Himatt, S.M, Derbala, M.F, Alshamali, M., Mahadoon, L.K., Khogali, H.S, Sallam, M., Al Thani, A.A, Al Thani, M, Al Kaabi, S., Yassine, H.M(2019)Demographics and epidemiology of hepatitis B in the state of Qatar: A five-year surveillance-based incidence study. Pathogens **8**: 1–10.
17- Al-Sadeq, D.W, Taleb, S.A, Zaied, R.E, Fahad, S.M , Smatti, M.K, Rizeq, B.R, Al Thani, A.A, Yassine, H.M, Nasrallah, G.K(2019) Hepatitis B virus molecular epidemiology, host-virus interaction, coinfection, and laboratory diagnosis in the MENA region: An update. *Pathogens* , **8**(2):1-4
18-Ataei, B., Alavian, S.M, Shahriari-Fard, F, Rabiei, A.A., Safaei, A, Rabiei, A, Ataei, M(2019) A case-control study of risk factors for hepatitis B infection: A regional report among Isfahanian adults. J. Res. Med. Sci, **24**: 22
19- Pourhassan A. Association between ABO Blood/Rhesus Grouping and hepatitis B and C: a case-control study. Pak J Biol Sci. 2014;17(6):868- 71.
20- Jefferys SD, Kenneth CA.(2005) Transfusion Biology and therapy. In Gerad L. Mandell, Principles and practice of Infectious Diseases 6th Ed. Philadelphia: Churchill Livingston, 46:708.
21- Garratty G.(1991) Relationship of blood groups to disease: do blood groups antigens have a biological role? Rev Giblett ER. Blood groups and blood transfusion. In: Wilson JD, Braunwald E, Isselbacher KJ, Petersdorf RG, Martin JB, Fauci AS, et al. (Eds). Principles of Internal Medicine. 12th Ed. New York: McGraw-Hill, Inc.,1496.
22. Gibson JR, Harrison GA, Clarke VA, Hiorns RW.(1973) IQ and ABO blood groups. Nature. 246:498-500
23. Garratty G. (2000)Blood groups and disease: a historical perspective. Trans Med Rev. 14:291-301.
24. Garratty G.(1991) Do blood groups have a biological role? In: Garratty G (ed). Immunology of Transfusion Medicine. New York: Dekker. 201-255.
25. Moulds JM, Moulds JJ.(2000) Blood group associations with parasites, bacteria and viruses. Transfus Med Rev. 14:302-11.
26. Levinson W.(2004) Medical Microbiology & Immunology. 8th Ed. New York: McGraw-Hill, Inc. 350
27. Genc O. (2017) Hepatitis B virus infection and ABO/Rh blood groups. Int J Res Med Sci. 5:3782-5.

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تقيم ارتباط فصائل الدم، العمر، الجنس مع التهاب الكبد الفيروسي المزمن نوع بي في المرضى العراقيين

رنا طالب محسن، انمار كامل مبارك
قسم التقانة الاحيائية، كلية العلوم، جامعة الانبار، الانبار، لعراق

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الكلمات المفتاحية:

فصائل الدم ، التهاب الكبد Rh،B

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الخلاصة:

يعد التهاب الكبد الفيروسي نوع بي المسؤول في وفيات ملايين من الاشخاص سنويا في انحاء العالم كل عام. حيث اثبتت دراسات قليلة حول مدى الارتباط بين التهاب الكبد الفيروسي المزمن نوع بي مع فصائل الدم المتنوعة. ان الهدف من في ديسمبر 2018 ولغاية اغطس تم دراسة 80 حالة مزمنة بالتهاب الكبد نوع بي و96 حالة كعينات سيطرة لا شخاص اصحاء وتم استخدام مربع كأي وتم ربط العلاقة بين فصائل الدم والعمر الجنس ومدى علاقتها بالتهاب الكبد المزمن نوع بي وكانت النتائج كما يلي بين مرضى (CVHB 80 (100 ٪) توزيع فصائل الدم كان كالتالي: المجموعة A٪(22.5 ، B (32.5 ٪ 57 (، AB (6.25 ٪ 5 (، O 31 ، (38.75 ٪). 73 (91.25 ٪) كانت Rh موجبة و7 (8.75 ٪) Rh سالبة. في المتبرعين بالدم الأصحاء، كان 20 (21.8 ٪) في المجموعة أ، 31 (32.3 ٪) وفي المجموعة ب ، 7 (7.3 ٪) وفي مجموعة AB ، 37 (38.6 ٪) و المجموعة O 87.4) والاناث Rh موجب و 9 (9.4) ٪ Rh سالب. وأظهرت أن معظم المرضى قد حان وقتهم، 62.5 ٪. العنوان الرئيسي: لم يكن هناك فرق كبير بين فصائل الدم (P <0.5) و Rh (P <0.5) التهاب الكبد الفيروسي المزمن.