IJBPAS, February, 2019, 8(2): 186-204

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

PREVALENCE OF HEPATITIS B AND C VIRUS INFECTION AMONG PATIENTS WITH VON- WILL BRAND DISEASE AT MEDICAL CITY / BAGHDAD 2018

HUDA ADNAN HABIB[1*], MYSAA BASIM ABBOD[2], MURTADHA HUSSEIN ALI [3], ALI ISMAIL KHALIL[4]

1: MBChB, FICMS/F.M/ Professor at Community and Family Medicine Department, Al Kindy College of Medicine /University of Baghdad

2: MBchB, FICMS/F.M/ Family Medicine Specialist/ Ministry of Health

3: MBChB, C.A.B.P/ Bghdad Teaching Hospital /Medical City/ MOH

4: MBChB, C.A.B.P/ MOH

***Corresponding Author: E Mail huda_adnan70@yahoo.com; Mobile no.: +9647832028790**

Received 15th Aug. 2018; Revised 12th Sept. 2018; Accepted 14th Oct. 2018; Available online 1st Feb. 2019

https://doi.org/10.31032/IJBPAS/2019/8.2.4615

ABSTRACT

Background: Viral hepatitis places a heavy burden on the health care. Large number of patient with bleeding disorders has chronic hepatitis C infection, while few are chronic carriers of hepatitis B virus.

Aims of study: evaluate the prevalence of HBV, HCV infection among patient with Von Willebrand disease and to find factors that associated with the chance of getting the infection.

Materials and methods: A cross sectional study was conducted on 145 patients with von Willebrand disease who registered in Hereditary Bleeding Disorders Unit at Medical City, Baghdad, during period between first of December 2017 to the 31st of July 2018. SPSS version 24 was used in statistical analysis. Descriptive statistics were presented as frequency and percentages. Chi-square test for association. $P \leq 0.05$ considered as a significant association.

Results: Out of total 145 patients, 16 patients were HCV antibody positive with a prevalence of 11% , None of the patients had HBV. There is a significant statistical association between the patient age and hepatitis C viral infection, (20%) of patients ages between 20-29 years were

seropositive to HCV. the majority of patient 33.3% showed Significant association between duration of disease and hepatitis C infection sero-positive (P< 0.05).

Conclusion: The prevalence of hepatitis C was high. The prevalence of hepatitis C is statistically significantly related to increase age, duration of disease and number of cryoprecipitate transfusion.

Keywords: prevalence, hepatitis infection, risk factors, von Willebrand's disease, patients, Baghdad

INTRODUCTION

Hereditary bleeding disorders include a group of diseases with abnormalities of coagulation. The most frequently encountered hereditary bleeding disorders include von Willebrand's disease and hemophilia A and B [1].

VWD is caused by a decrease in or dysfunction of the protein called Von Willebrand Factor (VWF) and affects both genders, the diversity of mutations results in various clinical manifestations, e.g., platelet dysfunction associated with decreased serum factor VIII levels [2].

Treatment of coagulopathies involves the replacement of deficient clotting factors, which is administered as processed concentrates from blood donors and/or synthesized by the pharmaceutical industry; clotting factor replacement increases the survival of coagulopathy patients. However, these patients are at an increased risk of infection with HBV and HCV because of multiple blood transfusions and frequent parenteral exposure [3].

Management of viral hepatitis is a major aspect of hereditary bleeding disorders nursing, large number of individual with bleeding disorders have chronic hepatitis C infection, while few are chronic carriers of hepatitis B virus, some of whom are co-infected with hepatitis D [4].

An understanding of viral hepatitis is essential to provide appropriate patient education and support in order to prevent or moderate the effects of chronic infection .

We must distinguish among these various viral infections and explain them to patients, interpret hepatitis tests and markers, explain how to prevent transmission to others and encourage behaviors that protect the liver from further harm; caring for those with chronic hepatitis and protecting those without hepatitis are integral to the practice of hereditary bleeding disorders nursing [4].

- 325 million people live with viral hepatitis (approximately 4.4% of the world's population) [5].

Viral hepatitis caused 1.34 million deaths in 2015, a number comparable to deaths caused by tuberculosis and higher than those caused by HIV; However, the number of deaths due to viral hepatitis is increasing over time, while mortality caused by tuberculosis and HIV is declining [5].

An estimated 57% of cases of liver cirrhosis and 78% of cases of primary liver cancer result from HBV or HCV infection.

Most viral hepatitis deaths in 2015 were due to chronic liver disease (720 000 deaths due to cirrhosis) and primary liver cancer (470 000 deaths due to hepatocellular carcinoma), These long-term complications are life-threatening and accounted for 96% of the deaths due to viral hepatitis, mortality from viral hepatitis has increased by 22% since 2000, Unless people with HBV and HCV infection are diagnosed and treated, the number of deaths due to viral hepatitis will continue to increase [5] .

New hepatitis B and C infections are seen more often in recipients of organs, blood, and tissue, along with persons working or receiving care in health settings, and in vulnerable groups [6].

Millions of people are living with viral hepatitis and million more are at risk, most people who were infected long ago with HBV or HCV are unaware of their chronic infection, they are at high risk of developing sever chronic liver disease and can unknowingly transmit the infection to other people [6].

Viral hepatitis places a heavy burden on the health care system because of the coasts of treatment of liver failure and chronic liver disease, in many countries viral hepatitis is the leading cause of liver transplants, such end stage treatments are expensive, easily reaching up to hundreds of thousands of dollars per person [4]. Chronic viral hepatitis also results in loss of productivity [7].

Populations at increased risk of HCV infection include: people who inject drugs, people who use intranasal drugs, children born to mothers infected with HCV, HBV, people with sexual partners who are infected with hepatitis B and C virus, prisoners or previously incarcerated persons, people who have had tattoos or piercings, and recipients of infected blood products or invasive procedures in health-care facilities with inadequate infection control practices [5].

The most vulnerable populations for acquisition of HBV and HCV infections are patients infected with human

immunodeficiency virus (HIV), patients with chronic renal failure (CRF) that are on hemodialysis and patients with coagulation disorders compared to the general population [3].

Patient with inherited bleeding disorder frequently receive blood and blood product so have high risk hepatitis infection , in a study done in Bosnia, HCV infection was positive in 38.7% of cases of hemophilia and infected hemophiliacs with HCV and HBV was found in 4% [8] .

In Brazil, the prevalence of HBV infection in patient with coagulopathy ranged from 0.7% to 2.3%, while HCV infection ranged from 2.5% to 34.9% in this population [10, 11].

In Scotland, the total number of patients with bleeding disorders, infected with HCV, is estimated at 455; of these, 255 had a documented positive anti-HCV test, while 200 were assessed as probably infected [12] .

Another study done in Iran shows that the prevalence rates of hepatitis B and C were 0.5% and 11.5%, respectively, among 619 patients with heredity bleeding disorders [13]. Studies from some neighboring Arabic countries reported an HCV infection rate of 29.4% to 79% among multi- transfused patients [14, 15].

A study done in Egypt showed that HCV prevalence among multi-transfused patients ranged between 10-55% [16].

In Iraq one study shows that prevalence of hepatitis B and C is 0. 259 %, 13.2% respectively in total coagulopathy population, and in those with VWD the prevalence of hepatitis C positive was 5.9 % [17].

Aim of the study

This study aimed to evaluate the prevalence of HBV, HCV infection among patient with Von Willebrand disease and to find factors that associated with the chance of getting the infection.

MATERIALS AND METHODS

Study design: A cross sectional study.

Study setting:

This study was conducted on von Willebrand disease patients registered in Hereditary Bleeding Disorders Unit in Medical City, Baghdad, during period between first of December 2017 to the 31st of July 2018.

The Hereditary Bleeding Disorders Unit is a referral clinic, inpatient ward and research heath care unit, it has complete team of doctors, paramedics, laboratory and pharmacist, established in 1997, instituted in Medical City, this hospital is one of governmental hospitals, in public area called Bab Al- Muadham in AL-Resafa Quarter of Baghdad.

This Unit dealing with patient with hereditary bleeding disease who are seeking medical care for purpose of treatment, receiving medication and follow up, in case of severe complications the patients was referred to special care unit like medical or surgical ward in Medical City. Drainage of cases mainly from Baghdad, and there were cases registered in the unit from other governorates in the country.

The sample:

All registered patients with Von Willebrand disease in the Hereditary Bleeding Disorders Unit in Medical City/ Baghdad till 31/7/2018, from multiple governorates of Iraq.

Selection criteria:

The inclusion criteria in this study were:

1- All registered VWD patients in the HBDs Unit in Medical City/ Baghdad.
2- All age groups
3- Both sexes

While the exclusion criteria were:

Patients with other type of hereditary bleeding disorders attending the Unit.

Method and data collection:

A convenience method of sampling was used in this study. The total number of sample was medical records of 145 patients. The researcher had made regular visits to HBDs unit for data collection in a system of 4-5 hours a day, 2-3 days per week, and for 8 months. According to the criteria listed above about 10 patients medical records were surveyed each time.

The diagnosis of VWD is done by a consultant doctor, based on history of bleeding, clinical examination and blood investigation (complete blood picture, blood group & Rh, BT, PTT, APTT, VWF-Ag, RCoF & factor ШV level)

We saw the viral screen of all patients for the presence of hepatitis B surface antigen (HBsAg), antibody of HCV (anti-HCV). Patients were considered HBV positive if they had (HBsAg- positive) in their serum, and were considered to be HCV positive if they had a positive test result for the presence of antibody to HCV by serological test.

Tools of data collection:

A questionnaire form paper had been developed and tailored by the supervisor for the process of data collection. The questionnaire form paper was piloted on a sample of ten patients selected randomly to know the time needed to fill the questionnaire, and to figure out any difficulty in collecting the information, the questionnaire was appropriate and so did not change it, and Patient's medical records that used in the pilot project were included in the sample of the study.

The questionnaire contained:

The questionnaire forms cover many aspects including the following information's:

a- Demographical data: (sex, age, residency, marital state, educational level).

b-Clinical profile of the patient: include blood group, level of (VWF-Ag & factor IIIV) at time of diagnosis, presenting complaint, age at presentation ,age at diagnosis, type of treatment , number of cryoprecipitate and other blood product transfusion .

c- Results of serological viral markers (Anti-HCV, HBsAg).

d- Family History: parental consanguinity (relative or not), history of VWD in the family.

Data management and statistical analysis:

Data of all cases were checked for any error or inconsistency then transferred into a computerized database program; Microsoft excel software was used. All variables were coded with a specific code for each variable and prepared for statistical analysis.

SPSS (statistical package for social sciences) software for windows version 24 was used in statistical analysis.

Descriptive statistics were presented as frequency (number of cases) with proportions (percentages) for categorical variables, and as mean ± standard deviation and range for discrete variables.

Chi-square test for independence used as appropriate to test the significance of association between discrete variables.

P value is asymptomatic and two sided, level of significance (P. value) was set at $P \leq 0.05$ considered as significant difference or association. Finally, results were presented in tables and figures.

Administrative Design:

A- Communication:

Communication was carried out with Medical City Health Directorate and HBDs Unit to get their permission for carrying out the study (appendix A).

B- Ethical consideration: the following ethical considerations were insured

1- Approval of Arab board of Family Medicine – ethical committee was obtained.
2- Permission was taken from Medical City Health Directorate (appendix A).
3- Data were collected anonymously and confidentiality of data throughout the study was assured.

RESULTS

The 145 patients with Von Willebrand disease who were admitted to the Hereditary Bleeding Disorder Unit in Medical City in Baghdad were enrolled in the current study,

the majority of them 33.8% were of age 10-19 years age, 54.5% were males, 70.3% of them were single, 61.4% were from Baghdad center, the highest blood group type 33.7% was type O, followed 30.3% by type B. This study demonstrates that majority of VWD patients 60.7% had positive family history of the disease and 77.9% of them had positive consanguinity. as shown in table (1).

On studying the clinical presentation of the sample, table (2) shows that the most common and first clinical presentation that made the patient seek consultation was epistaxis in 54 patients (37.2%), followed by muco-cautaneous bleeding, upper GIT bleeding, menorrhagia with (13.8, 11 and 9) % respectively.

The current study revealed that most of the patients 40% were diagnosed when their ages were between 1-4 years old, 20% of them diagnosed when they were below one year old, 13.8% of them when they were between 5-9 years old and 15.9 of them diagnosed when they were =>20 years old. As shown in table 3.

Regarding type of treatment, the present study revealed that majority of patients 95.9% received cyklokapron (tranexamic acid), followed by (86.9, 53.8 and 13.1)% of patients received cryoprecipitate , VWF concentrate and blood respectively, as shown in figure (1).

Out of total 145 patients, 16 patients were HCV antibody positive with a prevalence of 11%, None of the patients had HBV, as shown in table (4).

There is a significant statistical association between the patient age and hepatitis C viral infection, that the frequency of infection is increase with increasing age ($p< 0.05$), where there are 49 patients ages between 10- 19 years, 6.1 % of them (3 patients) were seropositive to HCV; while 30 patients ages between 20-29 years, 20% of them (6 patients) were seropositive to HCV, as shown in table (5).

As shown in table (6), there is no significant statistical association between the gender and risk of hepatitis C infection, there are 79 male patients , 12.7% of theme (10 male patients) were seropositive to HCV, and 66 female patients, 9.1% of them (6 female patients) were seropositive to HCV, ($P> 0.05$).

On studying the association of the study sample according to their blood group and the status of hepatitis C virus infection , the current study shows there is no significant association between blood group and hepatitis C infection ($P> 0.05$), as shown in table (7).

Regarding the duration of the disease, there is significant association between duration of disease (from time of diagnosis till the time of the study) and hepatitis C infection, table (8) shows that the frequency of infection is increase with increase the duration of disease. the majority of patient with more than 20 years duration 33.3% were sero - positive (P< 0.05), when the duration of disease from 1-4 years; only one patient (2.6%) from total 39 patients were seropositive to HCV.

There is significant association between the number of cryoprecipitate units received by patients and to increase risk of hepatitis C infection. The frequency of infection is increase with increase the number of units were received (P< 0.05), where 37 patients with VWD were received more than 100 units of cryoprecipitate, 29.7% of them (11 patients) were seropositive to HCV; while 27 patients were received between 10 -19 units of cryoprecipitate no one of them had seropositive to HCV, as shown in (Table 9).

Table 1: The distribution of the sample according to some socio-demographic characteristics

		No.	%
Age (years)	**0---9**	**34**	**23.4**
	10---19	**49**	**33.8**
	20---29	**30**	**20.7**
	30---39	**19**	**13.1**
	40---49	**9**	**6.2**
	=>50	**4**	**2.8**
	Mean ±SD(Range)	**19.9±13.1 (9M -59Y)**	
Gender	**Male**	**79**	**54.5**
	Female	**66**	**45.5**
Residence	**Baghdad center**	**89**	**61.4**
	Baghdad periphery	**21**	**14.5**
	Outside Baghdad	**35**	**24.1**
Marital status	**Single**	**102**	**70.3**
	Married	**43**	**29.7**
Blood group	**A**	**43**	**29.7**
	B	**44**	**30.3**
	AB	**9**	**6.3**
	O	**49**	**33.7**
Family history	**Positive**	**88**	**60.7**
	Negative	**57**	**39.3**
Consanguinity	**Positive**	**113**	**77.9**
	Negative	**32**	**22.1**

Table 2: The distribution of the sample according to most common clinical presentation of the patients for seeking consultation

Type of presentation	No.	%
Epistaxis	54	37.2
Sub-muco-cutaneous bleeding	20	13.8
Upper GI bleeding	16	11.0
Menorrhagia	13	9.0
Bleeding after oral injury	12	8.3
Bleeding after circumcision	10	6.9
Joint bleeding	10	6.9
Umbilical bleeding	3	2.1
Bleeding after tooth extraction	2	1.4
Muscular bleeding	2	1.4
Bleeding after ear piercing	1	0.7
Bleeding after vaccination	1	0.7
Tonsillar bleeding	1	0.7
Total	145	100

Table 3: The distribution of the sample according to age at diagnosis of VWD

		No.	%
Age at diagnosis (years)	<1	29	20.0
	1---4	58	40.0
	5---9	20	13.8
	10---14	8	5.5
	15---19	7	4.8
	=>20	23	15.9
Total		145	100%

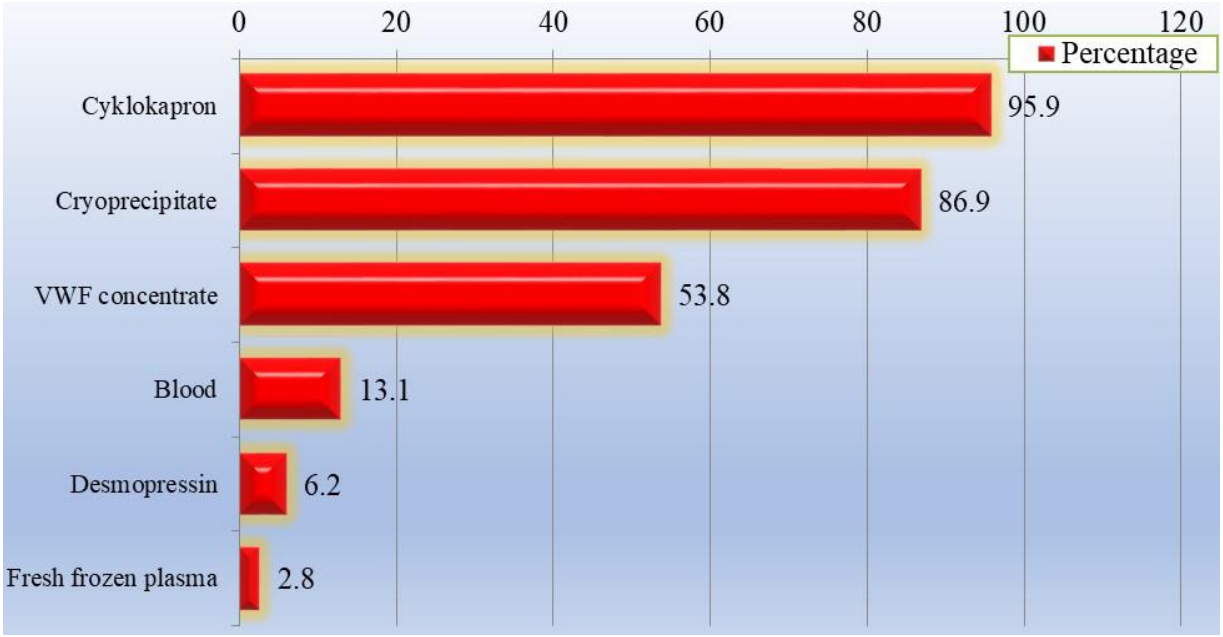

Figure 1: The distribution of the sample according to the type of treatment that received by patients

Table 4: The distribution of the study group according to serology status of hepatitis B and C

		No.	%
Hepatitis B virus	Positive	0	0
	Negative	145	100
Hepatitis C virus	Positive	16	11
	Negative	129	89

Table 5: The association of the study sample according to their age group and the status of hepatitis C virus infection

		Total no.	Hepatitis C virus				P value
			Positive		Negative		
			No.	%	No.	%	
Age (years)	0---9	34	0	0	34	100.0	0.018*
	10---19	49	3	6.1	46	93.9	
	20---29	30	6	20.0	24	80.0	
	30---39	19	3	15.8	16	84.2	
	40---49	9	3	33.3	6	66.7	
	=>50	4	1	25.0	3	75.0	
*Significant association using Pearson Chi-square test at 0.05 level							

Table 6: The association of the study sample according to their gender and the status of hepatitis C virus infection

		Hepatitis C virus				Total of No.	P value
		Positive		Negative			
		No.	%	No.	%		
Gender	Male	10	12.7	69	87.3	79	0.495
	Female	6	9.1	60	90.9	66	

Table 7: The association of the study sample according to their blood group and the status of hepatitis C virus infection

		Hepatitis C virus				Total of No.	P value
		Positive		Negative			
		No.	%	No.	%		
ABO Blood group	A	3	7.0	40	93.0	43	0.610
	B	7	15.9	37	84.1	44	
	AB	1	11.1	8	88.9	9	
	O	5	10.2	44	89.8	49	

Table 8: The association of the study sample according to their duration of the disease and the status of hepatitis C virus infection

		Hepatitis C virus				Total of No.	P value
		Positive		Negative			
		No.	%	No.	%		
Duration of disease (years)	<1	0	0	4	100.0	4	0.001*
	1---4	1	2.6	38	97.4	39	
	5---9	0	0	31	100.0	31	
	10---14	3	12.0	22	88.0	25	
	15---19	3	15.8	16	84.2	19	
	=>20	9	33.3	18	66.7	27	
*Significant association using Pearson Chi-square test at 0.05 level							

Table 9: The association of the study sample according to total number of cryoprecipitate units they received and the status of hepatitis C virus infection

		Hepatitis C virus				Total of No.	P value
		Positive		Negative			
		No.	%	No.	%		
Number of Cryo. transfusions	No	0	0	18	100.0	18	0.004*
	<10	0	0	17	100.0	17	
	10---19	0	0	27	100.0	27	
	20---29	0	0	10	100.0	10	
	30---39	0	0	8	100.0	8	
	40---49	1	20.0	4	80.0	5	
	50---59	1	14.3	6	85.7	7	
	60---69	1	16.7	5	83.3	6	
	70---79	-	-	4	100.0	4	
	80---89	1	33.3	2	66.7	3	
	90---99	1	33.3	2	66.7	3	
	=>100	11	29.7	26	70.3	37	
*Significant association using Pearson Chi-square test at 0.05 level							

DISCUSSION

Von Willebrand disease is a hereditary bleeding disorder. In general, genetic diseases do not receive any public health support because they are considered to be rare conditions with low prevalence, and very few descriptive studies about von Willebrand disease were done, so some of our results were not compared with others. Furthermore, actual statistics on the demography of genetic diseases in the Iraqi population are unavailable. Few published studies in Saudi Arabia, Jordan and in Egypt describe the distribution of IBDs in the population [18, 19, 20].

The manifestations of disease are different ranging from minor to severe life threatening bleeding, the current study showed that the epistaxis is the commonest presentation, followed by muco-cautaneous bleeding, upper GIT bleeding, and menorrhagia respectively. A study conducted in India by Trasi S. (2005) [21] , to see the prevalence and spectrum of vWD showed comparable results, Shahbaz N et al reported in their study that mucocutaneous bleeding is the primary presentation of patients [22].

About age at diagnosis of VWD, the current study revealed that most of vWD patients 60% of them diagnosed when they were below 5 years old, the age at diagnosis were determined from the case paper. A study done by Safaa A. Faraj et al in Iraq 2017 [23], showed that most (66.7%) of vWD patients diagnosed when thy was below 10 years old.

In Iraq, consanguineous marriages are frequent; therefore autosomal recessive bleeding disorders reach a higher prevalence than in many others countries.

The present study showed that consanguinity and family marriages among parents, is an important aspect of VWD, where found that

majority of patients had positive consanguinity, this in agreement with study done by Shahbazi et al in Iran, where found that most of the patients were off springs of consanguineous marriages [24] . A study conducted in Northern Pakistan showed consanguinity in 40.6% of parents [23].

The current study revealed that family history of bleeding is present in 60.7% of patients. Family history of bleeding reported in a study done by Metjian D.A et al was 58% [25].

Nowadays, patients with HBDs are growing older and survive, so experience diseases of the elderly like cancer and ischemic heart disease [26]. However, these have not yet become the commonest causes of death due to the appearance of transfusion transmitted diseases especially viral hepatitis which is a major co-morbid condition among patients with HBDs who received non virus- in activated or insufficiently inactivated clotting factor concentrates or cryoprecipitate [27, 28].

Patients with VWD are unique model to investigate hepatitis associated with poly transfusions because they have long been exposed to single donor blood products such as whole blood, or cryoprecipitate but less frequently to large-pool coagulation factor concentrates, that carried a high risk of transmitting hepatitis B and hepatitis C viruses, unlike patients with hemophilia, those with VWD have a mild to moderate bleeding tendency, so that their rate of transfusion treatment is usually much lower than in hemophiliacs [29].

Transfusion-transmitted infections are an emergent public health problem in various parts of the globe, mostly in areas where blood screening practices are poor and the prevalence of parenterally transmitted infections between blood donors are high [30].

The present study shows that the prevalence of hepatitis C was 11% among patients with VWD. In contrast to another study done in Iraq by Manal Khudder Abdul Razak in 2014, which shows that the prevalence of hepatitis C was (7%), this differences may be due to Manal's study include all patients with hereditary bleeding disorders while our study include only patients with VWD [17].

In the present study, the overall prevalence of HCV infection among cases of vWD is considered very high because in Iraq hepatitis C is considered of low endemicity with a rate of 0.5% in blood donors [31, 32] compared with other countries. WHO estimated that the prevalence rate for HCV infection of about 4.6% in Eastern Mediterranean in 1999, Egypt had the largest scale ranging from 6% to 28%, the

prevalence rates reported were 1.8% in Turkey and 2.2% in the Gaza Strip [33].

These differences in the prevalence of HCV infection may be attributed to different epidemiological distribution and risk factors of HCV infection between these countries.

The prevalence of HCV infection in blood donors in a another study done in Baghdad / Iraq, between (2006–2009), was found to be 0.3% in all donors [34], this indicates that blood products are important predisposing factor to get HCV infection despite the extensive screening and disinfection procedure done in our country.

This could be attributed to the fact that frequent use of the same person over time to blood products in their life lead to increased cumulative risk to get HCV infection as shown by Yazdani et al study who found that only poly transfusion is independently associated with HCV infection [35].

In Iraq anti- HCV ELISA is the only screening test for detection of HCV infection in all blood donors, after exposure to HCV, anti-HCV antibodies can be detected by ELISA in 50 to 70% of the patients at the onset of symptoms, this percentage increasing to about 90% after three months and the remaining 10% may take even longer, despite of the presence of viremia in acute infections [36].

In the current study the prevalence of hepatitis C infection among VWD patients may be associated to certain factors which include: (age, gender, blood group, duration of disease and to history of transfusion of cryoprecipitate or other blood product).

It was found that HCV infection more statistically significant in association to advance age > 19 years old. This agrees with the result by Chung –Jl in Taiwan 1997 [37], and the study by Sanchez, Jl et al in Pero 2000 [39]. This could be because of the increasing physical activity of patients with increase age and get young which make them more susceptible to mucocutaneous bleeding and hemarthrosis, as well as female start menstruation after puberty and so increase rate of bleeding by menorrhagia. All that lead to treatment with transfusion of blood or blood products and this will increase the risk of blood born infections.

In the current study there is no statistically significant association between gender of HCV seropositive patients, this disagree with Safaa A. Faraj etal study in Iraq 2017 [23], this difference may be because Safaa's study was included all patients with hereditary bleeding disorders, that high percent of them were hemophilic patients while our study involve VWD patients that include both male and female.

In the present study, the duration of VWD from age at diagnosis till now, showed an effect on increased risk of HCV infection with a statistically significant difference, this result is in agreement with the study done by Manal Khudder Abdul Razak in Iraq 2014 [17]. This could be due to the fact that as the patient younger he gets the highest chance to use more frequent transfusion during his life span and more chance to get HCV infection.

It was found that the most common blood group with HCV seropositive is blood group B, in contrast to Safaa A. Faraj et al study in Iraq 2017 [23] , which found that the most common blood group was type A , this may be because Safaa's study consisting of a small sample size (35 patients) and all patient from Alkut.

In the current study, HCV infection has statistically significant association to transfusion of cryoprecipitate , from another point the prevalence is directly associated to the number of transfused units, this result is in agreement with the Safaa A. Faraj et al study in Iraq 2017 [23], and also with study done by Calderon GM et al in Mexico 2009 [40], this may be due to the fact that the blood screening for antibody to HCV could not completely eliminate the risk of HCV transmission by cryoprecipitate , this because of the screening for HCV in Iraq and some other countries done by using ELISA technique, which is not very accurate, and many countries are using better techniques for screening donated blood for viruses by recombinant immunoblot assay and polymerase chain reaction techniques. Moreover, the donor could be in a window period (i.e. before antibodies appearance) during which, the infection may not be detected serologically [40].

This study shows that the prevalence of hepatitis B in VWD patients was zero , this agree with study done by Manal Khudder Abdul Razak in Iraq 2014 [17], and Safaa A. Faraj study [23], both studies show that the prevalence of hepatitis B in VWD patients was zero, this result may be due to screening program of blood donors which was implemented in Iraq at 1996, and vaccination programs by hepatitis B vaccine for all children in Iraq and for other risk groups including patients with hereditary bleeding disorders, that play an important role in decreasing HBV infection.

CONCLUSION

The prevalence of hepatitis C in patients with VWD is still significantly high. The prevalence of hepatitis C is statistically significant related to increase age (More than 20 years old), Duration of disease (more when the duration of disease ≥ 20 years) and

number of cryoprecipitate transfusion (more in patients who were received ≥ 100 units of cryoprecipitate). No one of the VWD patients had HBV infection.

REFERENCES

[1] Papadopoulosa N., Argianaa V., Deutschb M. Hepatitis C infection in patients with hereditary bleeding disorders: epidemiology, natural history, and management. Annals of Gastroenterology. 2017 Oct; 31(1): 35–41. Available from: doi: 10.20524/aog.2017.0204. [Accessed 15th march 2018].

[2] Federici A.B., Santagostino E., Rumi M.G., Russo A., Mancuso M.E., Soffredini R., Mannucci P.M., Colombo M. The natural history of hepatitis C virus infection in Italian patients with von Willebrand's disease: A cohort study. Haematologica. 2006; 91: 503–508.

[3] Barbosa J.R., Bezerra C.S., Carvalho-Costa F.A., Azevedo C.P., Flores G.L., Colares J.K.B., Lima D.M, Lampe E., and Villar L.M., Cross-Sectional Study to Determine the Prevalence of Hepatitis B and C Virus Infection in High Risk Groups in the Northeast Region of Brazil. Int J Environ Res Public Health. 2017 Jul; 14(7): 793. Available from: doi: 10.3390/ijerph14070793. [Accessed 15th march 2018].

[4] Troisi CL, Hollinger FB, Hoots WK, et al. A multicenter study of viral hepatitis in a United States hemophilic population. Blood 1993; 81: 412-8.

[5] World Health Organization. Hepatitis B and Hepatitis C. WHO fact sheet. Available online: http://www.who.int/mediacentre/factsheets/en. [Accessed on 5th March 2018)] . Updated April 2018.

[6] El Khourya AC, Wallaceb C, et al. Economic burden of hepatitis C-associated disease: Europe, Asia Pacific, and the Americas. Journal of Medical Economics. Posted online on March 30, 2012. Available from doi: 10.3111/13696998.2012.681332.

[7] Su J, Brook RA, Kleinman NL, Corey-Lisle P. The impact of hepatitis C infection on work absence, productivity, and healthcare benefits costs. Hepatology 2010; 52(2):436-42.

[8] Zhubi B, Mekaj Y, Baruti Z, Bunjaku I, Belegu M. Transfusion-Transmitted Infections in Hemophilia patients. Bosn J Basic Med Sci. 2009; 9: 271–7.

[9] Waheed Y, Shafi T, Safi SZ, Qadri I. Hepatitis C virus in Pakistan: a systematic review of prevalence, genotypes and risk factors. World J Gastroenterol. 2009; 15(45): 5647–53.

[10] Ferreira A.A., Leite I.C.G., Bustamante-Teixeira M.T., Guerra M.R. Hemophilia A in Brazil—Epidemiology and treatment developments. J. Blood Med. 2014;5:175–184. doi: 10.2147/JBM.S68234.

[11] Brazilian Health Ministry. Profile of Hereditary Coagulopathies in Brazil. Brazilian Health Ministry; Brasília: 2015. Secretary of Health Care. General Coordination of Blood and Hemoderivatives; p. 62.

[12] Khan MM, Tait RC, Kerr R, et al. Hepatitis C infection and outcomes in the Scottish haemophilia population. Haemophilia 2013; 19: 870-875.

[13] Farjami A., Haghpanah S., Arasteh P., Ardeshiri R., Tavoosi H., Zahedi Z., Parand Sh., Karimi M. Epidemiology of Hereditary Coagulation Bleeding Disorders: A 15-Year Experience From Southern Iran. Hospital Practices and Research. 2017; 2(4): 113-117. Available from: doi: 10.15171/HPR.2017.27. [Accessed 17th march 2018].

[14] Bahakim H, Bakir TM, Arif M, Ramia S. Hepatitis C Virus Antibodies in High- Risk Saudi Groups. Vox Sang. 1991; 60(3): 162–4.

[15] Rikabi A, Bener A, Al- Marri A, Al- Thani S. Hepatitis B and C Viral Infections In Chronic Liver Disease: A Population Based Study In Qatar. East Mediterr Health J.2009; 15(4): 778–84.

[16] Mohmoud YA, Mumtaz GR, Riome S, Miller D, Abu- Raddad LJ. The Epidemiology Of Hepatitis C Virus In Egypt: A systematic Review And Data Synthesis.BMC Infectious Diseases 2013; 13: 288.

[17] Abdul Razak M.Kh., Mishlish S.M. The Epidemiological Characteristics of Hepatitis C Virus Among Patients with Inherited Bleeding Disorders. Journal of Natural Sciences Research. 2017; 7(2) . [Accessed 17th April 2018].

[18] Al Fawaz IM, Gader AMA, Bahakim HM, Al Mohareb F, AlM women AK, Harakati MS (1996) Hereditary bleeding disorders in Riyadh, Saudi Arabia. Ann Saudi Med; 16:257–261.

[19] Al Sabti EA, Hammadi IM (1979) Inherited bleeding disorders in Jordan. Acta Hematol 61:47–51.

[20] EL-Bostany E A, Omerb N, Salama EE, El-Ghoroury E A, Al-Jaouni S K (2008) The spectrum of inherited bleeding disorders in pediatrics.. Blood Coagulation and Fibrinolysis, 19 (8): 771-775.

[21] Trasi S. Prevalence and spectrum of von Willebrand disease from western India. Indian J Med Res. 2005; 121(5): 653-58.

[22] Shahbaz N, Ayyub M, Ahmed .Spectrum of Von Willebrand Disease In Northern Pakistan. Pak J Pathol. 2008; 19(1): 29-32.

[23] Safaa A. Faraj, Ahmed I. Ansaf . Frequency of Hepatitis B and C Sero Markers Among Hemophiliacs and Von Willebrand's Disease in Alkut, Iraq. Journal of Global Pharma Technology. 2017; 06(9):109-115. Available Online at www.jgpt.co.in. . [Accessed 25th June 2018].

[24] Shahbazi S, Mahdian R, Ala F A.Molecular characterization of Iranian patients with type 3 von Willebrand disease. Haemophilia. 2009; 15: 1058–64.

[25] Metjian A D, Wang C, Sood S L. Bleeding symptoms and laboratory correlation in patients with severe von Willebrand disease. Haemophilia. 2009; 15: 918-25.

[26] Al Tonbary Y., ElAshry R., and Zaki M.E. Descriptive Epidemiology of Hemophilia, Mansoura, Egypt, 2010.

[27] Darby SC, Ewart DW, Giangrande PL, Spooner RJ, Rizza CR, Dusheiko GM, et al(1997) Mortality from liver cancer and liver disease in haemophilic men and boys in UK given blood products contaminated with hepatitis C. UK Haemophilia Centre Directors' Organisation. Lancet 350:1425-31.

[28] Makris M, Preston FE, Triger DR, Underwood JC, Choo QL, Kuo G, et al. (1990) Hepatitis C antibody and chronic liver disease in haemophilia. Lancet 335:1117-9.

[29] Augusto B. Federici. Elena Santagostino. Maria Grazia Rumi. Antonio Russo. Maria Elisa Mancuso. Roberta Soffredini. Pier M. Mannucci .Massimo Colombo. The natural history of hepatitis C virus infection in Italian patients with von Willebrand's disease: a cohort study. Haematologica. 2006; 91(4): 503-8. [Accessed 17th April 2018].

[30] Assarehzadegan MA, Ghafourian Boroujerdnia M, Zandian K. Prevalence of hepatitis B and C infections and HCV genotypes among haemophilia patients in ahvaz, southwest Iran. Iran Red Crescent Med J. 2012; 14(8): 470.

[31] Tarky MA, WijdanAkram, Al-Naaimi Sa, Ali Or. Epidemiology of viral hepatitis B and C in Iraq: a national survey 2005-2006. Zanco J. Med. Sci. 2013; 17 (1).

[32] World Health Organization fact sheets, Hepatitis C, World Health Organization, Geneva (2000), Available at: http://www.who.int/mediacentre/ factsheets/fs164/en/ (accessed August 2008).

[33] Tahan V, Ozdogan O, Tozun N. Epidemiology of viral hepatitis in the Mediterranean Bain. Annales Academiae Medicae Bialostocensis 2003; 48.

[34] Tarky M. Ataallah, Khaleel A. Hanan, Kadoori S. Maysoun et al. Prevalence of hepatitis B and C among blood donors attending the National Blood Transfusion Center in Baghdad, Iraq from 2006-2009. Saudi Med J. 2011; 32 (10): 1046-1050.

[35] Yazdani MR, Kassaian N, Ataei B et al. Hepatitis C virus infection in patients with hemophilia in Isfahan, Iran. Int J Prev Med, 2012; Special issue, S89-93.

[36] Tashkandy MA, Khodari YA, Ibrahim AM, Dhafar KO, Gazzaz ZJ, Azab BA. Evaluation of the available anti-HCV antibody detection tests and RT-PCR assay in the diagnosis of Hepatitis C Virus Infection. Saudi J Kidney Dis Transpl. 2007; 18:4: 523– 31.

[37] Chung-JL, Kao JL, Kong MS, Hung IJ, Lin TY. Hepatitis C and G virus infections in polytransfused children. Eur J Pediatr. 1997Jul; 156(7): 546-9.

[38] Sanchez JL, Sjogren MH, Callahan 3D, Watts DM, Lucas C, Abdel Haniid M, Constantine NT, Hyams KC, Hinostroza S, Figueroa Barrios R, Cuthie JC. Risk factors for infection, potential iatrogenic transmission, and genotype distribution. Am 3 Trop Med Hyg. 2000 Nov- Dec; 63(5-6): 242-8. Hepatitis C in Peru: PMID: 11421371.

[39] Calderon GMs, Ganzaez-Velazques F, Gonzalez- Bonilla CR, Novelo- Graza V, Terrazas. Prevalence and risk factors of hepatitis C virus, hepatitis B virus and human immune deficiency virus in multiply transfused

recipients in Mexico. Transfusion, 2009 Oct; 49(10): 2200-7. Epub 2009 Jan 15 PMID: 1953854.

[40] Medhat A, Shehata M, Magder LS, Mikhail N, Abdel-Baki L, Nafeh M, Abdel-Hamid M, Strickland GT, Fix AD. Hepatitis c in a community in Upper Egypt: risk factors for infection. Am J Trop Med Hyg. 2002; 66(5): 633–8.