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Original Article

Arteriovenous Fistula Hemostatic Complications in Hepatitis C Virus Patients

Bassam Maddah H. Al-Alosi[1*], Abbas Jaafar Khaleel Al-Anbari[2]
*[*1]Lecturer, college of medicine, University of Anbar, Iraq*
[2]Lecturer, Al-Nahrain University, Iraq
E-mail: qaisajam1981@gmail.com

ABSTRACT

Introduction: hepatitis C virus (HCV) is most common viral infection as result of RNA flavivirus. Sudden features and symptoms of infection by this virus is unusual and person ignorant the infection and become aware when signs and symptoms appear screened for other reasons or when they develop chronic liver disease.

Method: This prospective observational comparative study included 408 patients with ESRD on hemodialysis, 263 (64.46%) were female and 145 (35.53%) were male, their age ranged from 15 to 78 years (44.39 ± 15.06 S.D.). Results: Among the 408 CKD patients on hemodialysis; Almost two-third were female, 263 (64.46%) and 145 (35.53%) were males. Their age range was 14-79 years (39.55±12). Nearly one third (134/408, 32.8%) of the study subjects were anti-HCV IgG antibody positive ,85 (20.8%) were female, and 49 (12%) were males, age ranged from 14-57 years (mean ± SD 37.2±9 years) with variable frequencies among the three centers as following 41/129 (31.72%),31/89 (34.83%),62/190 (32.63%). There was no significant difference for age, between both groups A1 and A2 P- value more than 0.05. Nevertheless, mean of HB, hematocrit, count of platelet, aspartate transaminase level (AST), alanine transaminase level (ALT), prothrombin time (PT), and partial thromboplastin time (PTT) were higher in A1 than A2 and were significant.

Conclusion: decrease of factors that depend on releasing of vitamin K occur when there is liver cirrhosis as the following: decrease hepatic production besides decrease bile salts absorption that responsible for absorption of factors in need of vitamin K, occur in cholestasis liver illnesses. The PT test evaluates the function of coagulation elements in usual way of coagulation flow that include; Fibrinogen (I), Prothrombin (II), V, VII as well as X.

Keywords: Arteriovenous fistula, hemostatic, hepatitis C virus.

Correspondence
Bassam Maddah H. Al – Alosi
Lecturer, College of Medicine
University of Anbar
Iraq
E-mail address:
qaisajam1981@gmail.com

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INTRODUCTION

Hepatitis C virus (HCV) is most common viral infection as result of RNA flavivirus [1]. Sudden features and symptoms of infection by this virus is unusual and person ignorant the infection and become aware when signs and symptoms appear screened for other reasons or when they develop chronic liver disease [2]. 80% of persons had direct contact with virus lead to chronic infection and delay in response for viral allowance and recovery. No any protection for HCV either active or passive. Active infection can diagnose by C RNA in any person with positive antibody [2]. And this antibodies still in serum even when virus remove naturally or after treatment. HCV represents the major contributor of death due to chronic liver disease in United States, (~40%) out of 25000 persons die annually .The majority of newly acquired HCV infections are subclinical [3]. Despite this fact, hepatocellular carcinoma the fifth most common cause of malignant tumors worldwide is attributed 1-5% to infection with HCV. Seventy to ninety percent of HCV patients develops chronic hepatitis, and considerable number are at risk of progressing to chronic active hepatitis and cirrhosis (10–20%) [3]. HCV infection is more common in certain entities like chronic iv drug users ,drug addicts ,patients whom required repeated blood and blood products transfusion and Chronic kidney disease patients than other population .But it is estimated that (130-150) million people infected globally [4]. For CKD patients, HCV can lead to CKD and in the same time it can be transmitted to them in multiple ways like blood contact ,and patient to patient contact due to careless non hygienic measures during dialysis in addition to the need for blood transfusion may be more in those patients [5]. The prevalence of HCV infection are largely varied worldwide from less than 5% to about 60 percent in some studies [6, 7]. In Iraq the prevalence of HCV infection was reported to be (40.2%) in CKD patients on dialysis in Mosul to (62%) in haemodialysis patients [8]. In a survey using polymerase chain reaction (PCR) and serological procedure. The overall prevalence was (41.10%) in the three different centers ranging from (26.05%) to (62.82%) [9]. The treatment is important for both sides of the problem, HCV and CKD [10] .If HCV infection is not treated, development from chronic infection to cirrhosis need 20 to 40 years period. Causes for this development are; male gender, patient with immunocompromised state (including CKD), prothrombotic diseases and alcohol addicts. Patients with chronic kidney disease that on dialysis associated with HCV infection treated with interferon. Pegylated (PEG) interferon mostly effective than normal interferon for the end of management both types are with same toleration [10]. Dialysis patients are prone to blood-borne infections including HCV, transmitted through needles, transfusions, and dialysis catheters. These factors made an impact on personnel working with both creation of an access or with hemodialysis. HCV infection in CKD is associated with relatively high liver-related morbidity and mortality rates, accelerated progression to end-stage renal disease (ESRD), and increased risk of cardiovascular events [11]. HCV conveys a major medical burden and increases mortality in CKD patients whether maintained on hemodialysis or after renal transplant. Hemodialysis (HD) patients with HCV infection have higher rates of morbidity and mortality than those who are HCV free [12]. In this study, we aimed to identify the prevalence of hepatitis C virus infection in CKD patients in our local hospitals

recently. Also, the effect of infection with the virus on the creation of an arteriovenous fistula and related hemostatic complications. Which may lead to considerable failure of the procedure.

METHOD

This prospective observational comparative study included 408 patients with ESRD on haemodialysis, 263 (64.46%) were female and 145 (35.53%) were male, their age ranged from 15 to 78 years (44.39 ± 15.06 S.D.). The study involved patients who attended the three HD centers in Baghdad; Al-Yarmouk Teaching Hospital, Ibn-AlNafees Teaching Hospital and AlShaheed Ghazi Al-Hariri surgical hospital in Iraq from January 2017 to January 2019. Ethical approval was obtained from Al-Yarmouk Teaching Hospital ethics committee. Written or verbal consent was obtained from the patients and were informed about the study protocol and risks. Our inclusion criteria included those patients who are already diagnosed as ESRD who were operated for creation of AVF and undergo subsequent regular HD. Patients were already screened for viral hepatitis by commercially available detection kits. Patients whether positive or negative for HCV antibody were included in this study. All included patients were tested for liver function, and complete blood count .Doppler study was done for all patients to detect suitable vessels for creation of AVF. After creation of arteriovenous fistulae (AVF), both groups (HCV Ab positive and Negative) were followed for AVF maturation and failure and developments of complications in short term defined within 3 months timeframe and long term setting after 3 months of AVF creation. The list of the complications we tried to identify are shown in the results section. Clinical and radiological examination were used to identify the development of complications during the regular and unplanned visits of the patients to the outpatient clinics in the above mentioned hospitals. Statistical analysis: GraphPad prism software was used for statistical analysis. Chi Square analysis was used for testing relationships between categorical variables. *P* value less that <0.05 was considered statistically significant. The results are shown as mean ± SD.

RESULTS

Among the 408 CKD patients on hemodialysis; Almost two-third were female, 263 (64.46%) and 145 (35.53%) were males. Their age range was 14-79 years (39.55±12).

Nearly one third (134/408, 32.8%) of the study subjects were anti-HCV IgG antibody positive ,85 (20.8%) were female, and 49 (12%) were males, age ranged from 14-57 years (mean ± SD 37.2±9 years) with variable frequencies among the three centers as following 41/129 (31.72%),31/89 (34.83%),62/190 (32.63%). Al-Yarmouk Teaching Hospital, Ibn-Al Nafees Teaching Hospital, and AlShaheed Ghazi Al-Hariri surgical hospital respectively. While (274/408, 67.2%) were anti-HCV IgG antibody negative.

As clarified in table 1, Fifty-three of the 408 patients (13%) had complications related to hemostasis including bleeding and hematoma (group A). Thirty-eight of these 53 (72%) group A1 infection by HCV chronic, 28% group A2 no any infection. Group B 355 persons with no hemostasis (87%), 30% (106) persons with chronic infection B1 while 70% with no any infection B2. These figures reflect a statistically significant correlation between HCV seropositivity and development of hemostatic complication as shown in table 2.

Table1: Distribution of patients according to hemostatic complications and HCV seropositivity

			Number	Percentage
Group A	Bleeding and hematoma	Total	53	100
	A1	HCV +ve	38	72
	A2	HCV – ve	15	28
Group B	No bleeding and hematoma	Total	355	100
	B1	HCV +ve	96	27
	B2	HCV –ve	259	73

Multiple complications were observed in both HCV infection positive and negative which were included in this study. Complications happened both early and late from the date of creation of AVF .as shown in table 2

Table 2: Post arteriovenous fistula (AVF) creation complications

	HCV –ve	percentage	HCV +ve	Percentage	*P* ≤0.05
Seroma	33	12	19	14	NS
Edema	16	6	6	4.5	NS
Hematoma	9	3.2	18	13.5	≤0.05
Bleeding	6	2.1	20	15	≤0.05
Thrombosis	8	3	5	3.7	NS
Acute ischemia	8	3	8	6	≤0.05
infection	3	1	5	3.7	NS
Steal	2	0.7	0	-	NS
Aneurysm	3	1	4	3	≤0.05

Post cannulation rent	3	1	2	1.5	NS
Lymphedema	2	0.7	1	0.74	NS
Pulmonary hypertension	1	0.36	0	-	NS
Congestive cardiac failure	2	0.7	0	-	NS
Venous hypertension	3	1	1	0.74	NS

Except for bleeding, hematoma, acute ischemia and aneurysm, the occurrence of all other complications was no significant. As shown in table2.

There was no significant difference for age, between both groups A1 and A2 (p>0.05). However, the mean hemoglobin, hematocrit, platelet, serum levels of aspartate transaminase (AST), alanine transaminase (ALT), prothrombin time (PT), and partial thromboplastin time (PTT) were higher in A1 than A2 and were significant.

Table 3

	Group-A1 (HCV +ve) Mean ± SD	range	Group-A2 (HCV -ve) Mean ± SD	Range	*P* value
Age	40±9	26-58	43±14	14-74	NS
Hb	7± 2		9±2		≤0.05
HCT.	26±6		29±7		≤0.05
Platelet (1000 K/mm3)	153±43		215±72		≤0.05
Aspartate transaminase (IU/L) 10-40	59 ± 24		17±5		≤0.05
Alanine transaminase (IU/L) 7-56	64 ± 17		9±6		≤0.05
PT	19±5		15±2.5		≤0.05
pTT	40±4		32±3		≤0.05

DISCUSSION

HCV infection calamitous difficulty in ESRD persons, 5 to 85% globally is the prevalence of HCV in patients with ESRD [13, 14] approximately 1/3 of the study subjects were anti-HCV IgG antibody positive (134/408, 32.8%); most of them were female 85 (20.8%) were female, and 49 (12%) were males. The prevalence was statistically significant in females (P <0.05). Age ranged from 14-57 years (mean ± SD 37.2±9 years). The results have shown a significant increase in the number of people infected with HCV if compared to previous studies in Iraq. However, it is close to the results of other recent studies. This upsurge is due to more than one factor, including an increase in invasive medical procedures, a lack of awareness of the causes of disease spread and an increase in the number of dialysis patients. The study results reflect a statistically significant positive correlation between HCV seropositivity and the development of a hemostatic complication. As there is a clear elevation in the number of patients who have suffered complications related to hemostasis including bleeding and hematoma (p-value ≤ 0.05). This percentage is much higher than that recorded in another research on complications in patients with CKD[15] . Patients did not mention their infection with the HCV. This makes disproportional preoperative preparation to confront HCV causing Coagulopathy, thrombocytopenia, platelet dysfunction, anticoagulation during HD and anti-platelet therapy all these pose increased bleeding risk in ESRD patients or patients on HD [16]. This compatible to almost all relevant studies concerned for CKD and HCV infection. Aneurysm and acute ischemia are among the complications that have increased significantly. These problems are serious problems expected to occur in patients with CKD after the AVF. It is identical with other research findings [17]. This result is not surprising, especially if we know that the aneurysm is a common complication of AVF creation [18]. This might be due to an increase in the level of AVF flow and cryoglobulinemia postoperatively [18]. The mean hemoglobin, hematocrit, and platelets were significantly reduced in patients with hemostatic complications and HCV +ve when compared to those with –ve test. Serum levels of aspartate transaminase (AST), alanine transaminase (ALT), prothrombin time (PT), and partial thromboplastin time (PTT) were higher in HCV patients with bleeding or hematoma than HCV patients without hemostatic complications were and were significant. The results of this study do not go far from the results obtained from other studies. This can be explained by the effect of HCV and CKD on the hemostasis in the body and the blood cell count [19-21]. All factors that responsible for coagulation and fibrinolytic are reduced when there is liver cirrhosis due to decrease protein production, excluding VIII factor and fibrinogen which become high or normal [22].

CONCLUSION

Decrease of factors that depend on releasing of vitamin K occur when there is liver cirrhosis as the following: decrease hepatic production besides decrease bile salts absorption that responsible for absorption of factors in need of vitamin K, occur in cholestasis liver illnesses. The PT test evaluates the function of coagulation elements in usual way of coagulation flow that include; Fibrinogen (I), Prothrombin (II), V, VII as well as X.

CONFLICT OF INTEREST

None

REFERENCES

1. Han, R., et al., Prevalence of hepatitis C infection among the general population and high-risk groups in the EU/EEA: a systematic review update. BMC Infectious Diseases, 2019. 19(1): p. 655.
2. Debarshi kar mahapatra, vivek asati, sanjay kumar bharti (2019) recent therapeutic progress of chalcone scaffold bearing compounds as prospective anti-gout candidates. Journal of Critical Reviews, 6 (1), 1-5. doi:10.22159/jcr.2019v6i1.31760
3. Loomba, R., et al., The natural history of acute hepatitis C: clinical presentation, laboratory findings and treatment outcomes. Alimentary pharmacology & therapeutics, 2011. 33(5): p. 559-565.
4. Brody, H., Hepatitis C. Nature, 2011. 474(7350): p. S1-S1.
5. Gidado, Abubakar, Korawinwich Boonpisuttinant, Suthamas Kanjanawongwanich, and . "Anti-cancer and Anti-Oxidative Activities of Nigerian Traditional Medicinal Plants/Recipes." Journal of Complementary Medicine Research 10 (2019), 200-211. doi:10.5455/jcmr.20190731050619
6. Chapter 1: Definition and classification of CKD. Kidney international supplements, 2013. 3(1): p. 19-62.
7. KDIGO 2017 Clinical Practice Guideline Update for the Diagnosis, Evaluation, Prevention, and Treatment of Chronic Kidney Disease-Mineral and Bone Disorder (CKD-MBD). Kidney international supplements, 2017. 7(1): p. 1-59.
8. Caragea, D.C., et al., Hepatitis C Infection in Hemodialysis Patients. Current health sciences journal, 2018. 44(2): p. 107-112.
9. Najim, O. and M. Hassan, Prevalence of hepatitis C virus seropositivity among multitransfused patients with hereditary anemias in Basra, Iraq. Iraqi Journal of Hematology, 2018. 7(1): p. 39-44.
10. Abdullah, A., A.-R. Ahmed, and I. Latif, Hepatitis C Virus Prevalence in Haemodialysis Patients From Three Centers in Baghdad, Iraq: A Survey By Polymerase Chain Reaction and Serological Methods. Journal of University of Zakho, 2014. 2: p. 116-123.
11. Prabhu RA, Nair S, Pai G, Reddy NP, Suvarna D. Interventions for dialysis patients with hepatitis C virus (HCV) infection. Cochrane Database of Systematic Reviews. 2015(8).
12. Kim, S.M. and I.H. Song, Hepatitis C virus infection in chronic kidney disease: paradigm shift in management. Korean J Intern Med, 2018. 33(4): p. 670-678.
13. Kim, S.M. and I.H. Song, Hepatitis C virus infection in chronic kidney disease: paradigm shift in management. The Korean journal of internal medicine, 2018. 33(4): p. 670-678.
14. Dieterich, D.T. and J.L. Spivak, Hematologic disorders associated with hepatitis C virus infection and their management. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America, 2003. 37(4): p. 533-41.
15. Meyers, C.M., et al., Hepatitis C and renal disease: an update. Am J Kidney Dis, 2003. 42(4): p. 631-57.
16. Organization, W.H., Hepatitis C—global prevalence (update). Weekly Epidemiological Record= Relevé épidémiologique hebdomadaire, 1999. 74(49): p. 425-427.
17. Johny, S. and B. Pawar, Complications of arteriovenous fistula for haemodialysis access. International Surgery Journal, 2018. 5(2): p. 439-444.
18. Karle Pravin P, Dhawale Shashikant C. "Manilkara zapota (L.) Royen Fruit Peel: A Phytochemical and Pharmacological Review." Systematic Reviews in Pharmacy 10.1 (2019), 11-14. Print. doi:0.5530/srp.2019.1.2
19. Etik, D.O., S. Ocal, and A.S. Boyacioglu, Hepatitis C infection in hemodialysis patients: A review. World journal of hepatology, 2015. 7(6): p. 885.
20. Odabaşı, D. and A.K. Gür, The association of aneurysms related to arteriovenous fistulas and chronic hepatitis C virus infection in maintenance hemodialysis. Türk Göğüs Kalp Damar Cerrahisi Dergisi, 2014. 22(1): p. 76-82.
21. Kade, G., et al., Pseudoaneurysm of arteriovenous fistula for haemodialysis. Polski merkuriusz lekarski: organ Polskiego Towarzystwa Lekarskiego, 2002. 13(77): p. 399-402.
22. Nielsen, N.S., et al., Impaired platelet aggregation and rebalanced hemostasis in patients with chronic hepatitis C virus infection. International journal of molecular sciences, 2017. 18(5): p. 1016.
23. Wang, C.-S., et al., Strong association of hepatitis C virus (HCV) infection and thrombocytopenia: implications from a survey of a community with hyperendemic HCV infection. Clinical infectious diseases, 2004. 39(6): p. 790-796.
24. Organization, W.H., Guidelines for the care and treatment of persons diagnosed with chronic hepatitis C virus infection. 2018.
25. Ifeanyi, O.E., et al., A REVIEW ON HEPATITIS AND HAEMOSTASIS. Int. J. Compr. Res. Biol. Sci, 2018. 5(2): p. 24-46.

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