IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 5 Ver. 6 (May. 2018), PP 33-36
www.iosrjournals.org

Serum ferritin levels among Hepatitis B Sudanese patients in Kha rtoum, 2018

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Abstract
Background: *Hepatitis B is an infectious disease caused by the hepatitis B virus (HBV) which affects the liver. I t can cause both acute and chronic infections.Ferritin is a universal intracellular protein that stores iron and rel eases it in a controlled fashion.*
Objective: *The purpose of this study was to to estimate Serum ferritin levels in hepatitis B virus infected patient s And normal Controls among the Sudanese population.*
Materials and Methods: *Forty samples from patients and forty from controls were evaluated to determine the serum ferritin levels among HBV positive patients. The serum ferritin was determined using Roche E411® che mistry analyzer.*
Results: *The comparison of serum ferritin levels between normal controls and Hepatitis B positive patients are s hown in Table 2. The level of Serum ferritin (mean ± SD) in Hepatitis B group was 392.78±114.61 while in cont rols group was 139.60±81.50. We found that serum ferritin levels in Hepatitis B positive group were significantl y higher than controls group (P= 0.000).*
Conclusion: *This study concluded that serum ferittin levels increased in patients with positive Hepatitis B virus.*
Keywords: *Serum ferritin, Hepatitis, HBV.*

Date of Submission: 26-04-2018 Date of acceptance: 14-05-2018

I. Introduction

Hepatitis B is an infectious disease caused by the hepatitis B virus (HBV) which affects the liver. It can cause both acute and chronic infections. Many people have no symptoms during the initial infection. Some deve lop a rapid onset of sickness with vomiting, yellowish skin& mucus membrane , tiredness, dark urine and abdo minal pain.[1] Often these symptoms last a few weeks and rarely does the initial infection result in death.[1][2]. In those who get infected around the time of birth 90% develop chronic hepatitis B while less than 10% of those infected after the age of five do.[3] Most of those with chronic disease have no symptoms; however, cirrhosis an d liver cancer may eventually develop.[4]

The risk Factors of HBV infection are :-alcoholic up use , drugs ,age (neonate and old) and unsafe se x .Transmission of hepatitis B virus results from exposure to infectious blood or body fluids containing blood du ring sexual contact,[5] blood transfusions and transfusion with other human blood products,[6] re-use of contam inated needles and syringes,[7] and vertical transmission from mother to child during childbirth.[8] on the other handferritin is a universal intracellular protein that stores iron and releases it in a controlled fashion. The protein is produced by almost all living organisms, including algae, bacteria, higher plants, and animals. In humans, it a cts as a buffer against iron deficiency and iron overload. Ferritin is found in most tissues as a cytosolic protein, b ut small amounts are secreted into the serum where it functions as an iron carrier. Plasma ferritin is also an indir ect marker of the total amount of iron stored in the body, hence serum ferritin is used as a diagnostic test for iron -deficiency anemia(normal range of ferritin; male;23-336ng/ml ,fameles;11-306ng/ml).

Ferritin is a globular protein complex consisting of 24 protein subunits and is the primary intracellular i ron-storage protein in both prokaryotes and eukaryotes, keeping iron in a soluble and non-toxic form. Ferritin th at is not combined with iron is called apoferritin.

There are however multiple copies of the ferritin genes. The major function of ferritin is clearly to prov ide a store of iron which may be used for haem synthesis when required. Iron uptake in vitro requires an oxidizi n g a g e n t , a n d i r o n r e l e a s e r e q u i r e s a r e d u c i n g a g e n t . [9]

II. Materials And Methods

This study is a case-control study, conducted in Khartoum state, Sudan, in the period from May to Aug ust 2017. It is included 40 patients with Hrpatitis B and 40 healthy as control group.

Blood samples were collected from all subjects in Plain containers for measurement of serum ferritin pr ofile using Roche E411® chemistry analyzer method. The control group consisted of healthy volunteers without a medical history of diseases. This study was approved by ethical committee of the faculty of medical laborator y sciences, Alneelin University, and informed consent was obtained from each participant before sample collecti on.

Elecsys® technology

ECL (ElectroChemiLuminescence) is Roche's technology for immunoassay detection. Based on this te chnology and combinedwith welldesigned, specific and sensitive immunoassays, Elecsys delivers reliable result s. The development of ECL immunoassays is based on the use of a rutheniumcomplex and tripropylamine (TPA). The chemiluminescence reaction for thedetection of the reaction complex is initiated by applying a voltage to the sample solution resulting in a precisely controlledreaction. ECL technology can accommodate many immun oassay principles while providing superior performance.

III. Results

This case control study includes 80 participants, 40 of them were Sudanese patients with Hepatitis B and 40 app arently healthy volunteers were included in the study as control group.

Statistical analysis :-

The patients' ages were ranged from 18-50 years (Mean 34). The comparison of serum ferritin levels between no rmal controls and Hepatitis B patients are shown in Table 2. The level of Serum ferritin (mean ± SD) in Hepatiti s B group was392.78±114.61while in controls group was139.60±81.50. We found that serum ferritin levels in H epatitis B group were significantly higher than controls group (P= 0.000). However, Serum ferritin levels among patients age groups 18-28 Years,29-39 Years and 40-50 Years were found to be 352.81±120.9, 415.44±88.5 an d 426.58±73.6, respectively. There was no significant difference in serum ferritin levels between age groups(P > 0.05).showed in the tables below .

Table (1) distribution of patients according to the age

Age group	Frequency	Percentage (%)
18-28 Years	12	30.0
29-39 Years	23	57.5
40-50 Years	5	12.5
Total	40	100.0

Table (2) mean concentration of S.Ferritin in HBV compared with control group

Group	Mean	*P-value*
Case	392.78±114.61	0.000
Control	139.60±81.50	0.000

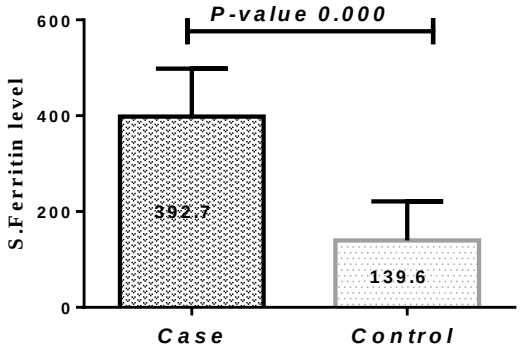
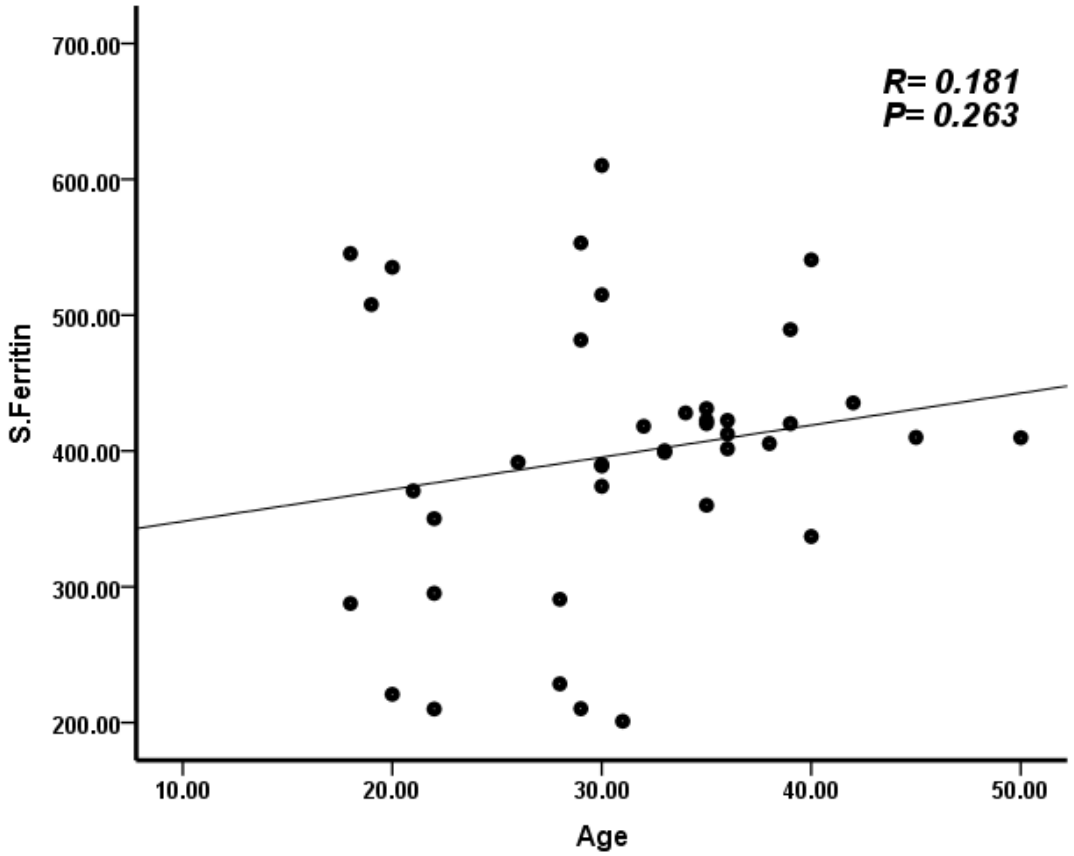


Table (3) Distribution of serum ferritin patient according to age group

Age group	Mean±SD	*P-value*
18-28 Years	352.81±120.9	0.076
29-39 Years	415.44±88.5	0.081
40-50 Years	426.58±73.6	0.062



IV. Discussion

In a large group of patients with chronic viral Hepatitis , we have shown that more than one third had e levations in serum ferritin levels, Thus, many patients with chronic hepatitis have abnormal results of serum ferr itin status tests that are probably clinically significant

The most plausible reason individuals with chronic hepatitis have elevated serum ferritin levels in the a bsence of increased hepatic iron stores is that the serum levels reflect increased release of iron from damaged liv er cells. Because the increase in serum ferritin correlated strongly with increase in serum ferritin correlated stro ngly with the degree of hepatic injury (as measured by the serum AST activity

Hepatitis B is an infectious disease caused by the hepatitis B virus (HBV) which affects the liver. It ca n cause both acute and chronic infections. Many people have no symptoms during the initial infection. Some de velop a rapid onset of sickness with vomiting, yellowish skin& mucus membrane , tiredness, dark urine and abd ominal pain.[1] Often these symptoms last a few weeks and rarely does the initial infection result in death.[1][2] . In those who get infected around the time of birth 90% develop chronic hepatitis B while less than 10% of thos e infected after the age of five do.[3] Most of those with chronic disease have no symptoms; however, cirrhosis and liver cancer may eventually develop.[4]

Hepatic injury and dysfunction can disturb iron homeostasis. Excessive iron deposition in the liver lead s to further injuries by triggering hepatocellular necrosis, inflammation , fibrosis and even carcinoma . Many ex perimental and clinical studies suggest that chronic iron deposition promotes the progression of liver damage an d increases the risk of fibrosis, cirrhosis, and hepatocellular carcinoma in chronic hepatitis B patients . Furtherm ore, some studies suggest that excess iron in the liver may induce adverse effects on patients' response to antivir al therapy for chronic hepatitis

4 (Our study shows that comparison of serum ferritin levels between normal controls and Hepatitis B p atients are shown in Table 2. The level of Serum ferritin (mean ± SD) in Hepatitis B group was 392.78±114.61 while in controls group was 139.60±81.50. We found that serum ferritin levels in Hepatitis B group were signifi cantly higher than controls group (P= 0.000). Our study agrees with study done by WeiLin Mao et al [18] in Chin a 2015. They found that in HBV-infected patients, serum transferrin levels were lower and serum iron and ferriti n were higher compared with both non HBV patients. They conclude that the main cause of iron metabolism dis order in cirrhotic HBV-infected patients is liver injury. Another study by Bayraktar*et al.*[19] agrees with our stud y, they reported that serum ferritin levels increased in patients with HBV infection.

V. Conclusion

This study concluded that serum ferittin levels increased in patients with Hepatitis B virus, Accordingly , routine monitoring of serum ferritin, serum iron and other iron-associated parameters during clinical managem ent of chronic HBV infection will be helpful in understanding alterations in iron metabolism in HBV and their i nfluence on further liver injury.

Acknowledgment

Thanks to Hematology Department and Faculty of Medical Laboratory Sciences,Alnelain Univ ersity ,Sudan..And special thanks to my parent, Brothers

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