RESEARCH ARTICLE

COMPARING OF SOME HEMATOLOGICAL PARAMETERS IN PATIENTS WHO HAD RENAL FAILURE WITH VIRAL

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Abstract

Viral hepatitis is an important health problem in the world, where hepatitis B virus (HBV) or hepatitis C virus (HCV) infections are the main causes of liver insufficiency. The progressive diseases of chronic hepatitis B or C are associated with the progression of cirrhosis and hepatocellular carcinoma. Aim of study: was to compare some hematological parameters among patients who hand kidney failure with viral hepatitis with patients without viral hepatitis. The study included 56 blood samples from chronic renal failure (CRF) patients where 80% of them with viral hepatitis, while the rest (i.e. 20%) were not suffering from hepatitis. The highest rate of CRF cases had normal count of total WBC (mean $5.13.10^9$/L). Concerning RBC count the mean was ($3.44 \times 10^{*12}$/L) lower than the normal range ($3.5\text{-}5.5 \times 10^{*12}$/L), sixty-two percent 35/56 patients had a decreased level, 28 of them with hepatitis virus. The mean of neutrophils % count was 70.22 above than that the normal range 50-70, the increased count was found in 38/56 (67.8%), 30 patients of them were hepatitis positive and the highest count was 81.6. The mean of lymphocyte % count was (20.06) within the normal range (20-40). We concluded that 80% of the patients who had low count of RBC were hepatitis positive, 79% of the patients who had the increased count of neutrophils had hepatitis infection, from that the role of hepatitis infection on these parameters is clear. Therefore we recommended that giving treatment and follow up to patients who had abnormal levels of these blood components, Hepatitis B vaccination should be provided for all patients and staff in hemodialysis units.

Key Words: Viral Hepatitis; WBC; RBC; Lymphocyte; Neutrophil

Introduction:

Viral hepatitis is a main global public health concern, it is a source of substantial morbidity and mortality around the world. The causes of viral hepatitis are at least five distinct viruses A, B, C, D, or E and each returns to an unlike family of viruses, and they have very little in common except the target organ, they affect the liver and a certain gradation of shared epidemiology. The progressive diseases of chronic hepatitis B or C are associated with the progression of cirrhosis and hepatocellular carcinoma. Chronic liver disease is complemented by disorder of hepatocyte function including the synthesis of haemostastic factors. [1] The liver enzymes are involved in greatest routine laboratory tests which are total serum bilirubin (TSB), alkaline phosphatase (ALP), areaspartate aminotransferase (AST) alanine aminotransferase (ALT). Viral hepatitis likely responsible for an obvious rise in aminotransferase levels, although the rise linked with hepatitis C infection inclines to be more modest than that related to hepatitis A or B. [2] Hepatitis C virus infection can lead to peripheral blood cell sum irregularities that are generally related to hypersplenism, antiviral therapy, autoimmune mechanisms and reduced thrombopoietin levels [3]

According to geographical area there is a different epidemiology of HBV and HCV infection. Hepatitis B infection is a dangerous global health problem, with two billion people infected worldwide, and 350 million suffering from chronic HBV infection. Chronic hepatitis B (CHB) affects more than 400 million people globally, of whom 75% are Asians [4]. The Middle East studies conducted that HBV infection is a dangerous public health problem in the region. [4] Infection with hepatitis C is now the most communal reason of end-stage liver disease in numerous countries, also it is a blood-borne infection that was a well-known cause of post-transfusion hepatitis after introduction of hepatitis B screening in blood banking and before implementation of hepatitis C-sensitive screening laboratory methods. World Health Organization (WHO) estimates that up to 3% of the world's people have been infected with HCV [5]. Concerning to area the main prevalence of HCV infection occurs in Egypt, where the prevalence of infection rises gradually with age, and high rates of infection are observed among individuals in all age groups [6].

Material and methods:

In this work, blood samples was collected from 56 patients with chronic renal failure undergoing hemodialysis (HD) at the hemodialysis unit. The determination of W.B.C., R.B.C., lymphocyte, neutrophil in blood were done by (Abacus 380 hematology analyzer) where directly measured by volumetric impedance method. The statistical analysis was obtained using the statistical package for Social Science (SPSS) version (18) and Microsoft Excel (2010) software's. Descriptive Statistics for all data of each set were expressed as mean ±SD, and the present of abnormal value in any test was calculated as above or below the mean ±SD of the normal values for the matched control group.

Results and Discussion:

Relative to the figures (1) and (2), the rate of HCV infection (anti-HCV +ve rate) in patients on

haemodialysis was 24/108 (22.22%). HSBsAg or hepatitis C antibodies were found in 44 (41%) of them (28 males and 16 females), while the rest (i.e. 64 patients 59%) were not suffering from hepatitis

Comparison of the Value of Some Blood Indices among CRF Patients:

Concerning some important blood indices (WBC, RBC, Lymphocytes, Neutrophils), figure (2) shows the mean value of these indices in both groups of CRF patients with hepatitis and those without hepatitis. Non- significant statistical differences were found on applying Chi- square test on these data.
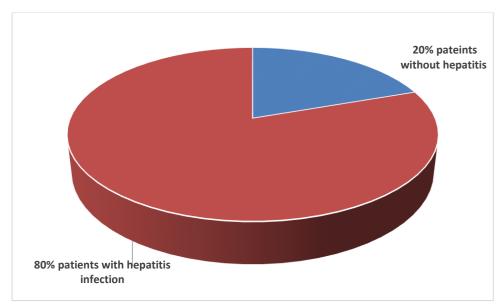

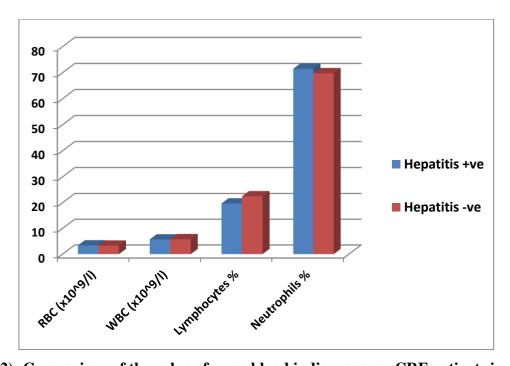*Fig (1): Prevalence of hepatitis B or C among chronic renal failure patients.*

Fig (2): Comparison of the value of some blood indices among CRF patients in current study.

Table (1) Some Blood Indices among CRF Patients with Hepatitis Virus.

	Mean	Increased		Decreased		Normal		Total	
		No.	%	No.	%	No.	%	No.	%
WBC . 10^{*9}/L	5.13	0	0	13	28.8	32	71.1	45	100
RBC.10^{*12}/L	3.4	1	2.2	28	62.2	16	35.5	45	100
Lymphocyte %	19.47	0	0	22	48.8	23	51.1	45	100
Neutrophile %	70.32	30	66.6	0	0	25	55.5	45	100

Table (2) Some Blood Indices among CRF Patients without Hepatitis Virus.

	Mean	Increased		Decreased		Normal		Total	
		No.	%	No.	%	No.	%	No.	%
WBC . 10^{*9}/L	5.8	1	9.09	3	27.27	7	63.63	11	100
RBC.10^{*12}/L	3.32	1	9.09	7	63.63	3	27.27	11	100
Lymphocyte %	22.5	1	9.09	6	54.54	4	36.36	11	100
Neutrophile %	69.83	8	72.72	1	9.09	2	18.18	11	100

Comparison of the value of some blood indices among CRF patients:

Abnormal peripheral blood cell count can progress in patients with HCV infection that are frequently attributed to hypersplenism, antiviral therapy, diminished thrombopoietin levels, and/ or autoimmune mechanisms[3].

This study revealed that the highest rate of CRF cases had normal count of total WBC (mean 5.13.10^9/L) (the normal rang 4-10 x10^9/L) this was agrees with Bukhari and Zafar [7] who informed that the total leucocytes count (HCV positive) are within normal range, on other hand the whole WBC count increased in 1 from 56 patients and decreased in 16/56 (35.5%) 13 of them was with

hepatitis virus. These results may be due to abnormal bone marrow function and no suppression in this component by hepatitis virus [8].

Concerning RBC count the average was (3.44 $x10^{*12}$/L) lower than the normal range (3.5-5.5 $x10^{*12}$/L), the declined count was find in (62%) $35/56$ patients, 28 of them with hepatitis virus. Anemia of chronic disease (ACD) is almost a regular feature in patients with chronic hepatitis which had a complex etiology involving impaired iron reutilizing, shortened red cell life span, low grade hemolysis, hyposecretion of erythropoietin and tissue hyporesponsivness to erythropoietin [9], and the decreased count of RBC in hemodialysis may be due to loss of blood in repeated dialysis [8].

The average of neutrophils % sum was 70.22 above than that the normal range 50-70, the increased count was found in $38/56$ (67.8%), 30 patients of them were hepatitis positive and the highest count was 81.6.

As neutrophils are the most common cell type seen in the primary phases of acute inflammation, most cases of increasing in the neutrophils count may be consequence to: inflammation predominantly chronic hepatitis, cancer – either by growth factors secreted by the tumor or attack of bone marrow by the cancer, increased damage of cells in peripheral circulation can catalyze bone marrow, stress – exercise, surgery, general stress, medication induced – corticosteroids[10].

Concerning to lymphocyte % sum the mean was (20.06) within the normal range (20-40), the declined count was found in $26/56$ (46.4%) patients, 22 of them with hepatitis virus and the average was 19.4 in patients with hepatitis virus. Effects of the decreased sum might be due to: infective diseases such as viral hepatitis, diverse medications chemotherapy, kidney or bone marrow transplant, kidney failure and severe burn, zinc insufficiency, nutritious - alcohol outcome, and hemodialysis [11].

Conclusion: The role of hepatitis infection on some blood components was clear where 80% of the patients who had low count of RBC were hepatitis positive and 79% of the patients who had the increased count of neutrophils had hepatitis infection

Recommendations: Give treatment to patients who had abnormal levels of these blood components, follow up to the same patient via measuring the level of these blood parameters before and after treatment. Hepatitis B vaccination should be provided for all patients and staff in hemodialysis units. Further studies on a much larger scale are needed to evaluate other factors that might affect the relationship between HBV and HCV infection with respect to hemoglobin, hematocrit levels, differential leucocyte count, phylogenic analysis for viral genotypes, viral titers, serum ferritin level and the degree of hepatic injury.

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