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Research Article

Correlation between HCV Infection and Creatinine Level in Thalassemia Patients

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ABSTRACT

Hepatitis C is an infectious disease that primarily affects the liver and is caused by the hepatitis virus type C. People often have mild or no symptoms –silent during the initial infection and about 75% to 85% of those initially infected, the virus persists in the liver with no symptoms in early chronic infection typically. Virus often leads to occasionally liver cirrhosis over many years (CDC, 2016). HCV is belonging to the Flaviviridae family which is RNA virus with single-stranded. Many autoimmune disorders are also associated with Hepatitis C such us insulin resistance, a low platelet count, autoimmune thyroiditis, diabetes mellitus, B-cell lympho proliferative disorders, lichen planus Sjögren's syndrome, necrolytic acral erythema, porphyria cutanea tarda anddiabetic nephropathy. And glomerulonephritis. Several disorders associated with hepatitis non-hepatitis virus have been reported, involving central nervous system, kidney, cardiovascular and metabolic diseases. There are a higher proportion of deaths due to extracranial complications that appear in hepatitis infection.

Keywords: Kidney defect; Thalassemia; HCV; Creatinine

INTRODUCTION

Hepatitis C is an infectious disease that primarily affects the liver and is caused by the hepatitis virus type C. People often have mild or no symptoms –silent during the initial infection and about 75% to 85% of those initially infected, the virus persists in the liver with no symptoms in early chronic infection typically. Virus often leads to occasionally liver cirrhosis over many years (CDC, 2016). HCV is belonging to the Flaviviridae family which is RNA virus with single-stranded. Many autoimmune disorders are also associated with Hepatitis C such us insulin resistance, a low platelet count, autoimmune thyroiditis, diabetes mellitus, B-cell lympho proliferative disorders, lichen planus Sjögren's syndrome, necrolytic acral erythema, porphyria cutanea tarda anddiabetic nephropathy. And glomerulonephritis. Several disorders associated with hepatitis non-hepatitis virus have been reported, involving central nervous system, kidney, cardiovascular and metabolic diseases. There are a higher proportion of deaths due to extracranial complications that appear in hepatitis infection.

Thalassemia's are inherited blood abnormality characterized by abnormal hemoglobin (low RBC quality production) (NHLBI, 2012) [1]. Chronic hepatitis infection is one of the complications of continuous blood transfusion especially hepatitis B or C. An antigen-antibody complex, which is immune complex formed during viral infection, involved integral binding of a soluble antigen to an antibody. The bound antigen and antibody act as a unitary object, effectively an antigen of its own with a specific epitope. This binding acts as a subject to several types of immune responses such us opsonization and complement deposition. Renal disease associated with hepatitis C virus infection There is a strong and likely causal association between chronic hepatitis C virus (HCV) infection and glomerular disease [2]. Several types of renal disease have been recognized including mixed cryoglobulinemia, membranoproliferative glomerulonephritis (MPGN), membranous nephropathy andpolyarteritis nodosa (PAN). In some patients, glomerular disease may be clinically silent.

MATERIALS AND METHODS

The present study was conducted in Al-Zahraa Hospital (thalassemia department).The study period was from December

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2017 to august 2018 [3]. The samples of the present study were obtained from the following sources:

- Fifty one kidney defect patient blood sample in tube without EDTA with age range between 15-30 years who have abnormal high creatinine level history and thalassemia.
- Fifty one thalassemia patients without kidney defect blood sample in tube without EDTA.limited age between 15-30 years who normal creatinine level history and thalassemia as control group.

Total number of both groups is 102 patients. All samples used for (HCV ELISA test, RT-PCR and creatinine level).

RESULTS

The Table 1 shows the kidney defect in patient for 1.4 mg/dl and the Figures 1A and 1B shows the graph and percentage of the kidney defect according to the age group.

Table 1: Thalassemia patient with kidney defect according to age group.

Age group	Kidney defect patient (above 1.4 mg/dl)	Percentage (%)
15-20	22	43.1
20-25	19	37.3
25-30	10	19.6
Total	51	100

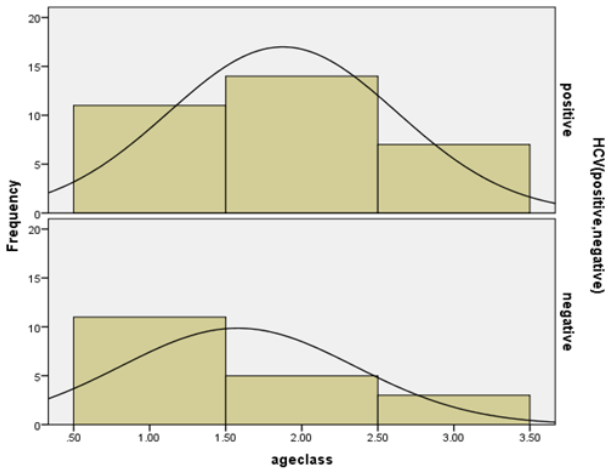

Figure 1A: The kidney defect according to age group.

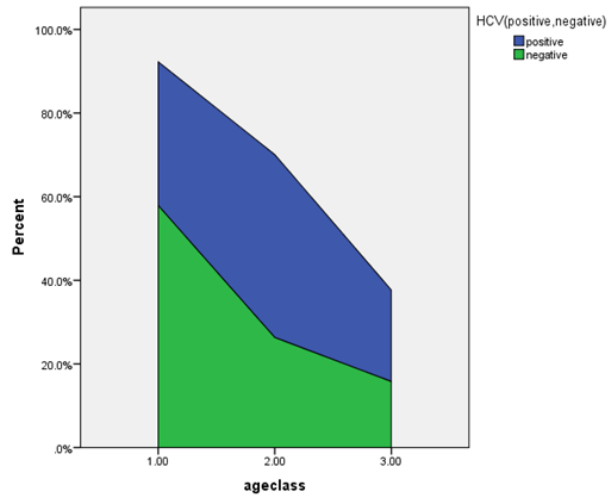

Figure 1B: The percentage of infectivity according to age group.

The Table 2 shows the data of Thalassemia patient without the kidney defect and the Figures 2A and 2B shows the graphical presentation of positive and negative patients.

Table 2: Thalassemia patient without kidney defect according to age group.

Age group	Thalassemia patient without kidney defect	Percentage (%)
15-20	23	45.1
20-25	12	23.5
25-30	16	31.4
Total	51	100

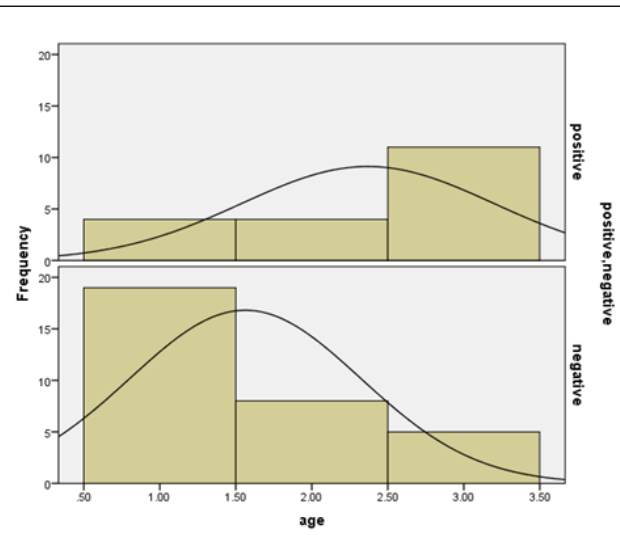

Figure 2A: The non-kidney defected patient according to age group.

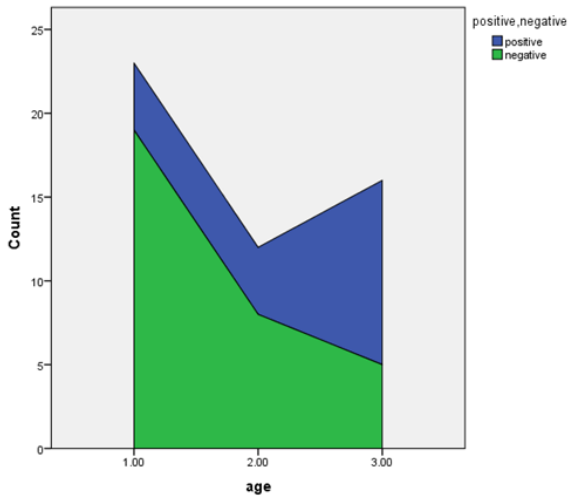

Figure 2B: The infectivity percentage according to age group.

The serological test included detection of anti-HCV antibodies by rapid test and then confirmed by ELISA technique [3-9]. The kidney defect group showed that a higher infection than control group 32/51 and 19/51 respectively (Table 3).

Table 3: The HCV infectivity in kidney defect groups of thalassemia patient.

HCV	Kidney defect patients
Positive	32
Negative	19
Total	51

The percentage of HCV infectivity was (61.6%) in kidney defect group, while the Table 4 and Figure 3 showed that the percentage of infectivity in control group (30.8%).

Table 4: The ratio of HCV infectivity in kidney defect in patient thalassemia.

Price-Related Differential	C. V.	
	Med. Centered	C. of Dispersion
1	0.308	0.186

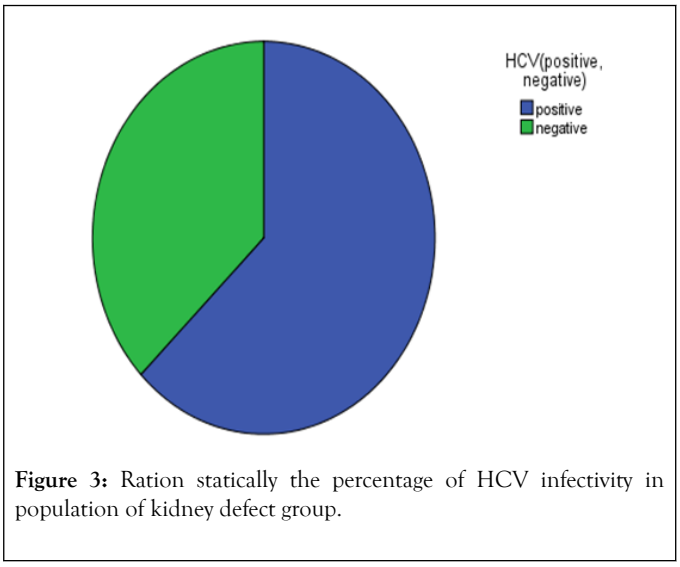

Figure 3: Ration statically the percentage of HCV infectivity in population of kidney defect group.

The Table 5 showed the percentage of HCV infectivity and normal kidney in the patient [10]. The Figure 4 showed the statistical ratio between HCV infectivity and non-kidney defect population group.

Table 5: The percentage of HCV infectivity and normal kidney in thalassemia patient.

Price Related Differential	Coefficient of Dispersion	Coefficient of Variation
		Median Centered
1	0.186	0.308

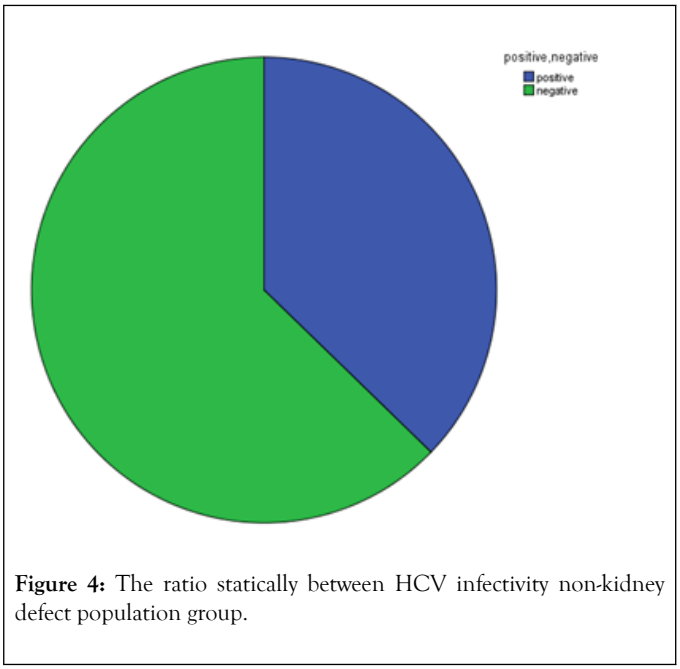

Figure 4: The ratio statically between HCV infectivity non-kidney defect population group.

DISCUSSION

A group of genetic and hereditary blood disorders characterized by alteration or absent β-globin chain synthesis that is known by (β-thalassemia syndromes); the result is an Hb decrease in (RBC), and anemia. Inherited as recessive traits that are the most thalassemia's form [11-14].

(Thalassemia International Federation, 2008) Indicates the clinical appearance of the β-thalassemia major presented between 60 days and two years. The infants who carry this syndrome are suffering from alteration in the maturation and normal growth. With regular blood transfusion system which maintains a lower Hb concentration of (9.5 to 10.5 g/dL), the growth and development tend to be at normal level up to ten to twelve years [15-19].

During healthcare process such as the blood transfusion, the chance of infection with HCV occur [20]. Without HCV screening, the transfusion of blood products and or organ transplants significantly increase the risks of infection. The pathogenesis of the Hepatitis C virus includes the immune complex of the glomerular and formation then deposition [21], the viral has ability of direct invasion of the renal parenchyma, The drugs are used for treatment leading to extra renal complications and nephrotoxicity. All that combines with HCV infection and cause alteration of the normal kidney function and its disease [22-25].

The current study revealed that out of the 32/51(62.7%) with kidney defect suffered from HCV infection and 19/51(37.2%) suffered from HCV infection without kidney defect as control group [26-28]. The diagnosis of kidney defect by detection creatinine level and then HCV infectivity detection by present IgM and IgG in serum patient by ELISA and RT-PCR.

This result agrees with. Who have used the same principle of Compared to the general population, the developing AKI diverse is higher risk in HCV-infected patients, the unrelated etiology apparently [29-32]. As an noted, community-based study of (six hundred and forty-eight) subjects with HCV infection chronically, as many as (Sixty-three) patients (19.4/2%) experienced (One hundred and twenty-four) episodes of acute kidney disease events over a period of follow-up ranging from ninety days to six years. According to Risk-Injury-Failure-Loss of function-End stage (RIFLE) standard, there are (fifty eight) (93.6/2%) at risk, twenty (32.2/2%) injured, forty-four (71/2%) failure, and two (3.2/2%) [33].

The random sample size of the kidney defect group in this study revealed that age group 15-20 years was higher in number of cases 22 out of 51(43.1%) than another age groups us what was found in Tables 1 and 2. In case of normal kidney group (control group) [34-38], the age group 15-20 years was a higher than another groups 23/51 (45.1%).

The kidney abnormality associated with younger age maybe due to high metabolic activity of liver and high immune response to virus infection all that cause load on kidney which reflected by increase creatinine level [39]. Who reveals that the liver biopsy gives key data on the degree of HCV-related hepatic ailment, but requires wariness in CKD because of the probable depressed hazard of bleeding involvement, essentially in patients who are suffering from chronic kidney diseases, The internal inflammation of kidney as Glomerulonephritis develops with advanced time, this maybe takes time to decades, after initial infection with HCV [40].

That the most common HCV-related nephropathy is MPGN, usually in the context of cryoglobulinemia. The majority of cryoglobulinemic HCV-infected patients have either no symptoms or nonspecific clinical manifestations. The triad of purpura, asthenia, and arthralgia is evident in nearly 30% of cases trials of. Indiscriminate judgement of inclusive contrast the effects of DFP on level of ferritin in serum at baseline and at from the 1990s follow-up have been written, combine dissection appeared a statistically significant reduce in the ferritin in the serum at half years duration in patronage of DFO, without variable difference between the 2 medicine at one year's duration [41].

The serological test included detection of anti-HCV antibodies by rapid test and then confirmed by ELISA technique. The kidney defect group showed that a higher infection than control group 32/51 and 19/51 respectively (Tables 3 and 4).

The variability degree of infection due to some of kidney defect patient receive the virus during dialysis in add to blood transfusion which increase chance of infection with HCV [42]. The fallowing study agree with HCV infectivity in our study, demonstrates that the Hepatitis C virus (HCV) is the frontier cause of after-transported blood hepatitis contagion (PTH). The virus strikes hepatocyte and leads to severe sore in liver with long-time disturbance and problems. Contagion with HCV may cause disabling presentation, fibrosis of liver tissue and cancer of the liver cell [43].

State that thalassemia is an inherited disorder that is a defined for syndrome. A high risk of hepatitis C in patients with thalassemia major is due to the transported blood from donors that carry the hepatitis C virus [44]. Although, amendment in sifting of blood products since (Ninety-eight hundred and eighty) to (Ninety-nine hundred) reduce the dangerous of transported virus through blood and blood-borne diseases also recommend that the infection with hepatitis C is till now stick around as remarkable issue in thalassemia patients.

Table 4 showed that the percentage of HCV infectivity was (61.6%) in kidney defect group, while the Table 5 showed that the percentage of infectivity in control group (30.8%). This means there are relationship between HCV infectivity and alteration of normal kidney function which agree with this study [35] Found that the hepatitis C virus (HCV) and prevalence of chronic kidney disease (CKD) is between 10%-16% worldwide.

The prevalence of HCV positive that studied by among hemodialysis patients can vary from <5% to as high as 60% from different regions in the world [45-48]. The link between HCV infection and kidney disease is well recognized by another study, complements that the existence of anti-HCV Ig is correlating with kidney disease advancement with a higher average of (+) anti-HCV in those with more advance stages of CKD.

Figure 4 illustrated the variability between kidney defect group and control group on different variable parameter as the relationship between HCV infection and compare it with (variability of iron load, gender, age group, normal and abnormal of creatinine). The kidney defect group contain (32 patient infected with HCV and control group contain 19 HCV infected patient), Figure 4 dependent on positive patient for HCV. The fallowing abnormality associated with extra hepatic abnormality in which reflected on many parameter and cause alternated it.

Mention thatthe outer liver disturbance which connectes with HCV infection caused (Immune system-relation outer live demonstration), skittish cryoglobulinemia, B-cell NHL, vasculitis Cryoglobulinemia, syndrome of Sicca, Arthralgia/myalgia, self-antibody production (i.e. cryoglobulins, factor of rheumatoid [49], and antibody against nuclear, antibody against inner mitochondrial membrane, antibody against thyroid and antibody against smooth muscle, panarteritis nodosa, Monoclonal gammopathy of undetermined significance (MGUS), Immune thrombocytopenic purpura (ITP), Inflammation-related outer liver manifestations, diabetes mellitus type two Insulin resistance, inflammation of nephron, kidney infancy, tiredness, reduce Cognitive, sorrow, arthritis and Cardiovascular disease (i.e. stroke, ischemic heart disease).

Newly, different other non-hepatic hepatitis C virus-connected abnormality have been discovered, which involved cardiovascular, kidney, metabolic and CNS diseases. HCV infection manifested a higher death percentage for outer liver complications [50].

There are many studies connected between HCV and age as the age has an influence on the treatment of chronic HCV infection and is considered an important factor. The occurrence of anti-HCV serum (+) resorts to be a higher level in the old age compared to smaller age people in different countries across the world. Caducity is considered as a negative agent for hepatic disease evaluation, progression and treatment result in HCV infection. In older age and age when infected with (HCV) are two agent that have effect on the evaluated hepatic fibrosis and the development of liver cell cancer. The age itself imitates to be a larger remarkable agent than the age at receive HCV in foretell the development of hepatic illness predominantly when the body exceeds sixty fife years of age.

In both group (kidney defect group and control group) detected the creatinine level and monitoring present of HCV. Table 5 showed statically the (61%) of kidney defect group suffering from HCV infection. And (30.8) of control group suffering from infection with HCV. This statistical results conclude that there is direct proportional relationship between viral infection and kidney defect.

Mention that, although the firstly onus of the sick that is relationship with deep-seated hepatitis C is hepatocyte connected (the thickening and scarring of connective tissue, usually as a result of virus injury for the hepatocyte, cirrhosis of the liver, and cancer of liver cell), different member systems may be included. In the urinary system, HCV appears to be most substantially connected with membranoproliferative glomerulonephritis (MPGN; which includes cryoglobulins or without cryoglobulins) and membranous glomerulonephritis [51].

Reveal that the dispersal of HCV serum (+) between patients with MPGN case sequence is nearly ten-fold more than the national propagation for HCV.

In addition, the occurrence of MPGN between the live prospective (cohorts) and necropsy sequence of HCV-Carrere people appears to have ultimately a higher percentage than for the ordinary population, this what has been found by other study like who have shown that HCV-Carrere individuals who are suffering from CKD have more death rates and a pressing rate of developing ESRD, reaching to the necessary Inquiry of if therapeutic effect to acquire a sustained viral restraint know as an undiagnosed viral load level three month after accomplishment of therapy (SVR12) would minify the percentage of decrease in GFR.

CONCLUSION

A high level of HCV in abnormal creatinine level group may indicates for viral effect on the kidney function and first group of thalassemia patients has higher susceptibility to HCV infection.

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