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Insulin Resistance in Non Diabetic Chronic Hepatitis C patients

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Abstract: Patients with chronic hepatitis have impaired glucose metabolism with hyperinsulinemia and insulin resistance, this hyperinsulinemia has been shown to be due to decreased insulin catabolism rather than increased pancreatic insulin secretion.We aim to evaluate insulin resistance in non diabetic patients with chronic hepatitis C virus infection. **our** study was a case-control study conducted in Tropical Medicine and Gastroenterology Department AL-Azhar University Hospital. 60 patients and 30 healthy controls were included in the study. The patients were classified into two groups:**Group A**: 30 patients with chronic hepatitis C infection were selected with positive HCV RNA in serum for at least 6 months; Patients were not receiving anti-viral therapy at the time of sampling They showed no evidence of cirrhosis. **Group B**: 30 patients with HCV related liver cirrhosis. They were divided according to Child Pugh score; **twenty** patients with HCV related compensated liver cirrhosis (Child A) Ten patients with HCV related decompensated liver cirrhosis (Child B and C). **Group C: The control group**: included 30 healthy individuals. All patients and control were subjected to the following: **Liver function tests**: Alanine transaminase **(ALT)**, Aspartate transaminase **(AST)**, total and direct bilirubin, total protein, serum albumin. Prothrombin time **(PT)** & international normalization ratio **(INR). Renal function tests**: Blood urea nitrogen (BUN), Na, K. Complete blood count. Alpha fetoprotein **(αFP).** Overnight fasting and two hours postprandial blood glucose level. Fasting serum insulin of each individual. Insulin resistance was determined via the Homeostasis Model assessment (HOMA-IR)

Statistical analysis of data will be done by using SPSS(statistical program for social science version22,produced by IBM SPSS Inc.,Chicago,USA).

Results: We found that out of 30 CHC and 30 LC (20 compensated LC, 10 de compensated LC) 8 (26.7%); 8 (40%) patients and 5(50%) respectively had HOMA-IR levels greater than 2.5, which is consistent with IR diagnosis. Decompensated cirrhotic patients showed higher frequency of IR compared to CHC, and compensated cirrhotic patients.

Coclusion: In chronic hepatitis C patients, HOMA-IR, fasting serum insulin and fasting blood glucose were significantly higher than healthy controls.

Keywords: *Insulin resistance, chronic hepatitis C*

Introduction

Hepatitis C virus (HCV) is a global disease, worldwide there are approximately 200 million individuals that are chronically infected with HCV. This can result in progressive hepatic injury and fibrosis, resulting in cirrhosis and end-stage liver disease (1).

Egypt has the highest prevalence of HCV in the world; about 12 to 15% of the total population is infected **(2).**

HCV mainly affects the liver, but also several tissues outside the liver have been reported to be involved, resulting in a wide spectrum of extra hepatic manifestations. During the last decade, it has been hypothesized that diabetes could be one of these extra hepatic conditions that are attributable to HCV infection. This raises the intriguing question of whether the rise in HCV infection is contributing to the increasing prevalence of type 2 diabetes **(3).**

Prospective studies have shown that insulin resistance precedes the onset of diabetes by 10-20 years; also the presence of diabetes may be associated with increased rate of progression of fibrosis in patients with chronic hepatitis C and chronic hepatitis B virus infection **(4).**

Insulin resistance (IR) is known to be associated with the visceral adipose tissue area. Initially, in patients with insulin resistance, increased insulin secretion helps to maintain euglycemia as it compensates for the body's reduced biologic response to insulin. However, overtime, hepatic glucose output is increased in both the fasting and postprandial states. This, coupled with reduced glucose disposal from the circulation, contributes to blood glucose elevation **(5).**

Patients with chronic hepatitis have impaired glucose metabolism with hyperinsulinemia and insulin resistance, this hyperinsulinemia has been shown to be due to decreased insulin catabolism rather than increased pancreatic insulin secretion **(6).**

Persico et al. (2007)(7) A higher prevalence of metabolic syndrome and diabetes mellitus in patients with hepatitis C virus than in patients with hepatitis B virus related chronic liver disease was reported. Recent years have seen numerous studies devoted to the relationship between chronic hepatitis C virus infection and insulin resistance **(8)**. However no sufficient data are available for the relationship between chronic hepatitis B virus infection and insulin resistance (9)

Hepatitis C virus (HCV) infection is now recognized as a systemic disease involving lipid metabolism, oxidative stress, and mitochondrial function, HCV infection was associated with an increased risk of diabetes mellitus or insulin resistance (IR). IR is the main feature of the metabolic syndrome, a common metabolic disorder that is a result of the increasing prevalence of obesity worldwide.and glucose metabolism impairment are also associated with cirrhosis, regardless of etiology. In addition, IR seems to be associated with liver necroinflammation and steatosis.(**10)**

Subjects and Methods

The study was a case-control study; patients were recruited from the Tropical Medicine and Gastroenterology Department at AL-Azhar University Hospital. 60 patients and 30 healthy controls were included in the study.

The patients were classified into 3 groups:

Group A: 30 patients with chronic hepatitis C infection were selected according to the following inclusion criteria:

Adult patients of both sexes with positive HCV RNA in serum for at least 6 months; with evidence of chronic hepatitis supported by liver biopsy in some patients. Patients were not receiving anti-viral therapy at the time of sampling.

The CHC patients were 19(63.3%) males and 11(36.7%) females with age ranging from 22 - 54 years and a mean age of 39.5±9.5 years.

Group B: 30 patients with HCV related liver cirrhosis. They were divided according to Child Pugh score; 20 patients with HCV related compensated liver cirrhosis (Child A). They were 14 (70%) males and 6 (30%) females with age ranged from 30-64 years and a mean age of 50.30±9.81years.

10 patients with HCV related decompensated liver cirrhosis (Child B and C). The age of the patients ranged from 48 to 75 years with a mean age of 58.38.31±5.81 years they were 8 (80%) males and 2 (20%) females.

Group C: The control group: included 30 healthy individuals (without any evidence of liver disease either clinically or laboratory) matched for age and sex with the CHC group. The healthy control group included 18 (60%) males and 12 (40%) females with a mean age of 35.12±4.20 years.

Exclusion criteria:

Patients who refused to participate in the study. Patients with hepatocellular carcinoma. Pregnant or breastfeeding females. Prior or current anti viral therapies.

Established diabetes mellitus. Regular or excessive alcohol consumption. Patients receiving drugs or having conditions that may cause fatty liver (steroids, tomoxifen, gastric bypass surgery, recent severe weight loss).Other liver diseases as alcoholic liver disease, drug-induced hepatitis, other viral hepatitis, hereditary haemochromatosis, Wilson's disease, autoimmune hepatitis, primary biliary cirrhosis (PBC)primary sclerosing cholangitis (PSC), α1 antitrypsin deficiency (α1 ATD). Ongoing intravenous drug abuse.

Methods

Before starting the study, the protocol was approved by AL-Azhar Assuit Faculty of Medicine Research Ethical Committee. All participants signed written consents then the following were done:

History taking included age, gender, presence of symptoms as bleeding tendency, fatigue, abdominal distention and lower limb swelling. Clinical examination, Physical signs of liver cell failure as jaundice, ascites, lower limb edema, palmar erythema and spider naevi., BMI was calculated as body weight in kilograms divided by the square of height in meters (kg/m2). Liver function test: Alanine transaminase (ALT), Aspartate transaminase (AST), total and direct bilirubin, total proteins, serum albumin. Prothrombin time (PT) & international normalization ratio (INR). Renal function tests: Blood urea nitrogen (BUN), Na, K. Complete blood count. Alpha fetoprotein (αFP). Diagnosis of chronic hepatitis C infection was based on positive HCV by PCR, persistent elevation of liver enzymes for more than 6 months and liver biopsy for some of the patients. Anti hepatitis C virus antibody (HCV Ab) using third generation enzyme linked immune sorbant assay (ELISA) test. Hepatitis B virus (HBV): HBVsAg. Over night fasting and two hours postprandial blood glucose level.

Fasting serum insulin from each individual. Serum insulin was measured by ARCHITECT plus 1 1000 based on chemiluminescent microparticle immunoassay (8K4 ARCHITECT insulin kit; Diagnostic Products Abbott Park, IL 60064 USA). Abdominal ultrasound. Abdominal ultrasound was performed for all patients using 3.5-5 MHz convex transducer **(8).** Insulin resistance was- determined via the Homeostasis Model assessment (HOMA-IR) as the following equation:-

Insulin resistance:

$$\frac{\text{Fasting insulin (}\mu\text{u/ml) x Fasting glucose (mmol/L}}{22.5}$$

An index value of > 2.5 was defined as IR. This cutoff value was chosen because studies suggested that a HOMA-IR of 2.4-3.0 is probably suitable to define IR in CHC patients **(9).** Blood samples were collected after 12 hours of overnight fasting.

Statistical analysis of data will be done by using SPSS(statistical program for social science version22,produced by IBM SPSS Inc.,Chicago,USA).

Results

The present study included 60 HCV patients with different clinical stages of chronic HCV infection. In addition, 30 age and sex matched healthy individuals were included as a control group. A cut-off value for HOMA-IR more than 2.5 was used. We found that out of 30 CHC and 30 LC (20 compensated LC, 10 decompensated LC) 8(26.7%); 8(40%) patients and 5(50%) respectively had HOMA-IR levels greater than 2.5, which is consistent with IR diagnosis. Decompensated cirrhotic patients showed higher frequency of IR compared to CHC, and compensated cirrhotic patients.

In chronic hepatitis C patients, HOMA-IR, fasting serum insulin and fasting blood glucose were significantly higher than healthy controls (p <0.0001). BMI was closely comparable between the two groups **Table (1).**

Cirrhotic patients showed a significantly higher mean values of fasting insulin, HOMA-IR index and fasting blood glucose than CHC patients. The mean values of fasting insulin and HOMA-IR were closely comparable in compensated and decompensated cirrhotic patients **Table (2).**

There was a statistically significant difference for cut off values of HOMA-IR between compensated and decompensated cirrhotic groups with more frequency of high value for HOMA-IR occurred in decompensated cirrhotic group ($\chi 2$=4.48 ,P=0.034) **Table(3)**.

Decompensated cirrhotic patients showed higher frequency of insulin resistance when compared to compensated cirrhotic patients (50.0% versus 40%; $\chi 2$=0.30, P= 0.582) or chronic hepatitis (50.0% versus26.7%;χ 2=3.14,p=0.076).

HOMA-IR values showed significant positive correlation with BMI, Prothrombin time, AFP and fasting insulin; and non significant correlation with serum albumin, bilirubin, AST, ALT, platelets, AST/ALT ratio, HCV level by PCR and fasting blood glucose levels **Table(4).**

The mean values of HOMA-IR were increased significantly among chronic hepatitis C, compensated cirrhotic patients and decompensated cirrhotic patients and were positively associated with the disease progression (F=4.518; P=0.014) **Table(5)** .

Table (1): Comparison between CHC and healthy controls regarding mean values of BMI, HOMA-IR, fasting insulin and fasting blood glucose.

Variable	Control group N=30	CHC N=30	P value
Mean BMI	23.44	21.63	0.179
Fasting glucose	4.687	7.756	**0.0001**
Fasting insulin	4.20	7.37	**0.0001**
HOMA-IR	1.055	1.84	**0.0001**

Table (2): Comparison of fasting glucose, fasting insulin and HOMA-IR among the studied groups

Variables	CHC (N=30)	Compensated LC (N=20)	Decompensated LC (N=10)	*P1*	*P2*	*P3*
	Mean ± SD	Mean ± SD	Mean ± SD			
Fasting blood glucose (mmol/L)	5.76±0.65	5.47±0.77	6.10±1.08	0.125	**0.022**	0.154
Fasting insulin (µU/mL)	7.37±4.61	10.56±4.05	11.54±5.93	**0.002**	0.509	**0.016**
HOMA-IR	1.84±1.06	2.58±1.14	3.19±1.84	**0.001**	0.177	**0.027**

P1 Decompensated LC versus CHC, *P2* decompensated LC versus compensated LC , *P3*compensated LC versus CHC

CHC: chronic hepatitis C; LC: Liver cirrhosis.

Table (3): Comparison between compensated LC and decompensated LC regarding HOMA-IR values

HOMA values	Compensated LC	Decompensated LC	Total
<2	12(60%)	3(30%)	15
2-4	6(30%)	4(40%)	12
>4	2(10%)	3(30%)	3
Chi-square test	**χ^2=4.48, P=0.034**		

Table (4): Correlation between HOMA-IR and demographic and laboratory data in the patients with chronic hepatitis C

Variable	HOMA-IR	
	Correlation coefficient	P value
BMI (Kg/m2)	0.518	**0.003**
Age (year)	0.248	0.187
AST (U/L)	0.045	0.815
ALT (U/L)	0.009	0.962
AST/ALT ratio	0.047	0.807
Albumin (g/dL)	-0.142	0.454
Bilirubin (mg/dL)	0.066	0.729
AFP (ng/mL)	0.371	**0.043**
Prothrombin time (seconds)	0.421	**0.020**
PCR (IU/L)	-0.066	0.728
Platelets (K/ µL)	-0.121	0.524
Hemoglobin (g/dL)	-0.174	0.284
WBCs (K/ µL)	-0.077	0.635
Fasting glucose (mmol/L)	-0.079	0.679
Fasting insulin (µU/mL)	0.946	**0.000**

Table (5): Comparison of the mean values of HOMA-IR in the studied groups

	Normal	Chronic hepatitis C	Compensated LC	Decompensated LC
Mean±SD (range)	1.055±1.08 (0.15_2.135)	1.84±1.06 (0.26-3.96)	2.58±1.14 (1.15-5.26)	3.79±5.50 (1.43-9.33)
Anova test	**F=4.518; *P* value=0.014**			

Discussion

Hepatitis C virus (HCV) is a global disease, approximately 200 million individual worldwide are chronically infected with HCV which can result in progressive hepatic injury and fibrosis, culminating in cirrhosis and end-stage liver disease. Egypt has the highest prevalence of HCV in the world; about 12 to 15% of the total population is infected **(2).**

There is no consensus on IR reference values among HCV carriers or even among subjects without liver disease. HOMA-IR index has been used as an indirect way to measure IR, and correlates well with insulin sensitivity using the euglycemic/hyperinsulinemic clamping technique **(11).**

In a Brazilian study, 1,203 patients without diabetes and without HCV infection were studied. They reported a HOMA-IR cut-off point of 2.7 for IR diagnosis, which is close to the level that was used in this study **(12)**. Also in several studies cut-off points indicator of IR range from 1.5 to 3 **(13, 14).** A cut-off value for HOMA-IR more than 2.5 was used in this study and out of 30 CHC, 20 Compensated LC and 10 Decompensated LC patients; 8(26.7%), 8(40%) and 5 (50%), patients respectively had serum HOMA-IR levels greater than 2.5, which was consistent with IR diagnosis.

In this study, there were significant differences in mean values of HOMA-IR, fasting insulin and fasting blood glucose between CHC and healthy controls with higher mean values found in CHC. The results of this study were in agreement with **Elbedewy et al. (2014) (15),** who found that serum insulin and HOMA-IR were higher in CHC than in healthy volunteers.

In the present study, the HOMA-IR value was assessed in different clinical stages of chronic HCV infection. Decompensated LC patients showed higher IR frequency (50%) compared to CHC (26.7%), and Compensated LC (40%). This is in accordance with the results of **Mohamed et al. (2011)** who found that patients with LC had a higher frequency of HOMA-IR (61.8%) than those with chronic hepatitis (39.5%) and advanced fibrosis (48.8%). Also, **Irshad et al. (2013)** found IR in 28.57% patients with CHC, 33.33% patients with LC **(16, 17)**.

Another study reported that 30 to 70% of CHC patients display some evidence of IR. The results of their studies have suggested the occurrence of IR early in the course of chronic HCV infection irrespective of the severity of liver disease **(18)**.

In the present study, cirrhotic patients had a significantly higher mean values of fasting insulin and HOMA-IR index than Healthy normal and CHC patients. In agreement with our result **Donadon et al.**

(2009), Gomaa et al. (2010), Hung et al. (2010) and Elsamanoudy et al. (2015) reported that patients with LC had significantly higher insulin level and HOMA-IR than those with chronic hepatitis **(19, 20, 21, 22)**. Also, in this study, the mean values of fasting insulin and HOMA-IR sh owed non significant difference between Compensated and Decompensated Cirrhotic groups.

On the other hand, **Mohamed et al. (2011),** who investigated the effects of HCV genotype-4 on the prevalence of IR in CHC and Cirrhotic Egyptian patients, found that Cirrhotic patients showed non significant difference in HOMA-IR values and insulin levels between CHC and Cirrhotic patients.

We found that the mean values of HOMA-IR increases progressively among chronic hepatitis C compensated and decompensated cirrhotic patients. IR is a characteristic feature in all stages of the liver diseases and the link between IR and chronic liver disorders increases significantly when the liver disease advances towards cirrhosis **(23).**

In this study, Prothrombin time was significantly prolonged in Cirrhotic patients with IR. According to another study by Li et al. This indicates that HOMA-IR index has a positive correlation with a worsening of the hepatic function **(24).**

In CHC group, we found that HOMA-IR index had significant positive correlation with BMI, prothrombin time, AFP and fasting insulin and no significant correlation with the age, serum albumin, bilirubin, AST, ALT and fasting blood glucose levels. This is in agreement with **Elbedewy et al. (2014),** who found significant positive correlations between HOMA-IR and both fasting insulin and AFP and no significant correlation with the age, serum albumin, bilirubin, AST, ALT and fasting blood glucose levels **(15)**.

Recommendation: Assessment of IR by HOMA-IR and improving insulin sensitivity is recommended in patients with HCV related chronic liver disease as this may reduce the rate of progression to cirrhosis . Monitoring and follow-up of serum glucose level in the fasting and postprandial states is of important issue in euglycemic CHC patients.

REFERENCES:

1-Mohd-Hanafiah K, Groeger J, Flaxman AD, Wiersma ST (2013): Global epidemiology of hepatitis C virus infection: new estimates of age-specific antibody to HCV seroprevalence. Hepatol. 57:1333-42.

2- Zekri AR, Bahnassy AA, Abdel-Wahab SA, Khafagy MM, Loutfy SA, Radwan H, Shaarawy SM (2009): Expression of pro- and anti-inflammatory cytokines in relation to apoptotic genes in Egyptian liver disease patients associated with HCV-genotype-4. J Gastroenterol Hepatol. 24: 416-28.

3-Hui H., Sud A. and Farrell G.(2003): Chronic hepatitis C virus infection and insulin resistance. Nature, 420: 333- 6,

4-Nocente., Ceccanti M., Bertazzoni G., Cam-Marota G., Silveri N. and Gasbarrini G (2003)..: HCV infection and extra hepatic manifestations. Hepatogeastro-enterology, 50: 1149-1154,

5-Reaven G (1995)., Path physiology of insulin resistance in human disease. Physiol. Rev., 75: 473-486,

6-Greco; Mingone G., Mari A., Capristo E., Manco M. and Gasbarrini G (2002).: Mechanisms of hyperinsulinemia in child's grade B liver cirrhosis investi-gated in free living conditions. Gut, 51: 870-5.

7-Persico M,Capasso M,Persico E, et al (2007).supressor of cytokine signaling 3(SOCS3)expression and hepatitis C virus related chronic hepatitis : insulin resistance and response to antiviral therapy . Hepatology;46 :1009-1015

8-Brand man D,Bacchett P, Ayala CE,Maher JJ , Khalili M, (2012), Impact of insulin resistance on treatment response and impact of HCV treatment on insulin sensitivity using Direct measurement of insulin action .diabetes care .35;1090-1024do : 10.2337 /dc 11-1837

9- Kumar M, Choudhury A, Manglik N,et .(2009). Insuline resistance in chronic hepatitis B virus infection, Am Jngastroentrol; 104:76-82

10-Mirandola, S., Realdon, S., Iqbal, J. et al.(**2006**). Liver microsomal triglyceride transfer protein is involved in hepatitis C liver steatosis. Gastroenterology. ; 130: 1661–1669

11 -Hung CH, Wang JH, Hu TH, Chen CH, Chang KC, Yen YH, Kuo YH, Tsai MC, Lu SN, Lee CM (2010): Insulin resistance is associated with hepatocellular carcinoma in chronic hepatitis C infection. World J Gastroenterol. 16(5): 2265-71.

12-Geloneze B, Pereira JA, Pareja JC, Lima MM, Lazarin MA, Souza IC (2009): HOMA1-IR and HOMA2-IR indexes in identifying insulin resistance and metabolic syndrome: Brazilian Metabolic Syndrome Study (BRAMS): Arq Bras Endocrinol Metabol. 53(2):293-300.

13-Huang HC, Chuang CS, Hsieh YY, Chang TS, Wei KL, Shen CH, Wu CS, Tung SY (2011): Serum HCV RNA level is not associated with insulin resistance and metabolic syndrome in chronic hepatitis C patients with genotype 1 or 2 infection.Chang Gung Med J. 34(5): 487-95.

14-De Souza AF, Pace FH, Chebli JM, Ferreira LE (2011): Insulin resistance in non-diabetic patients with chronic hepatitis C what does it mean? Arq Bras Endocrinol Metab. 55(6): 412-8.

15-Elbedewy M M, **Ghazy MA, Elbedewy TA, Suliman GA (2014):** Serum Resistin and Insulin Resistance as Risk Factors for Hepatocellular Carcinoma in Cirrhotic Patients with Type 2 Diabetes Mellitus. Life Sci J. 11(11): 941-9.

16-Mohamed A A, Loutfy S A, Cra ik J C, Hashem A M and Siam I (2011): Chronic hepatitis c genotype-4 infection: role of insulin resistance in hepatocellular carcinoma. Virol J. 8:496

17-Irshad M, Iqbal A, Ansari MA and Raghavendra L (2013): Relation of insulin resistance (IR) with viral etiology and blood level of cytokines in patients with liver diseases. Glo Adv Res J Med Med Sci. 2(3): 075-083

18-Veldt BJ, Chen W, Heathcote EJ, Wedemeyer H, Reichen J, Hofmann WP, de Knegt RJ, Zeuzem S, Manns MP, Hansen BE, Schalm SW, Janssen HL (2008): Increased risk of hepatocellular carcinoma among patients with hepatitis C cirrhosis and diabetes mellitus. Hepatol. 47:1856-62

19-Donadon V, Balbi M, Perciaccante A, Casarin P (2009): Insulin Resistance and Hyperinsulinemia in patients with chronic Liver Disease and Hepatocellular carcinoma. Clinical Medicine: Endocrinol Diabetes. 2: 25-33.

20-Gomaa AA, Helmy AM, El Fayuomy KN, Ahmed OM, El Sayed EE (2010): Role of insulin resistance in the development of hepatocellular carcinoma in patients with chronic hepatitis C. AAMJ. 8(3): 294-313.

21-Hung CH, Wang JH, Hu TH, Chen CH, Chang KC, Yen YH, Kuo YH, Tsai MC, Lu SN, Lee CM (2010): Insulin resistance is associated with hepatocellular carcinoma in chronic hepatitis C infection. World J Gastroenterol. 16(5): 2265-71.

22-Elsamanoudy AZ, Elalfy HA, Abdelmalak CA, Yousef ME (2015): Study of Interleukin-8 Gene Polymorphisms in Egyptian Hepatocellular Carcinoma Patients and Association with Insulin Resistance State. IJAR. 3(1): 216-26.

23-Lonardo A, Carulli N, Loria P (2007): HCV and diabetes a two-question-based reappraisal. Dig Liver Dis. 39:753-61.

24-Li X, Wu K, Fan D (2009): Insulin resistance and platelet count/spleen diameter ratio: two simple, easy-to-get tests for predicting esophageal varices in cirrhosis. Hepatol. 49(4):1394-5.

الملخص: يعتبر مرض التهاب الكبد الوبائي سي من اكثر الامراض شيوعا حيث تعتبر نسبته العالمية حوالى 3% و فى مصر اكثر من 15% ما يقرب من 20%الى30 % من هؤلاء المرضى يصابون بتليف الكبد مع مرور الوقت ويعتبر هذا التطور من اهم العوامل المؤثره فى هؤلاء المرضى وبما ان معظم المرضى لا تتطور حالتهم الى هذا التليف لذا لابد ان يكون هناك عوامل مؤثره تؤدى الى هذا التطور منها مقاومة الأنسولين و دهون الكبد . المرضى الذين يعانون من مرض مزمن فى الكبد اكثر عرضه لمقاومة الجسم للأنسولين ومع ذلك فان الفيروس الكبدي سي قد يؤدى الى مقاومة الجسم للأنسولين

الغرض من هذا البحث هو تقييم دور مقاومة الجسم للأنسولين المقدرة بواسطه (HOMA-IR) كعامل خطر فى تطور المرض وحدوث تليف لخلايا الكبد فى المرضى المصابين بالفيروس الكبدي سي وكذلك تقييم دور مقاومة الأنسولين فى زيادة درجة تليف الانسجه الكبديه.

وقد أجريت الدراسه على 60 مريض مصابين بالالتهاب الكبدي المزمن سي فى مراحل مختلفه من المرض كما تم اختيار 20 فرد من الاصحاء كمجموعه ضابطه ولقد تم استخدام مقياس (HOMA-IR) لقياس مقاومة الأنسولين ووجدنا من أصل 60 مصابين بالالتهاب الكبدي الفيروسي المزمن سي فقط 30 مريض مصابين بتليف الخلايا الكبديه وقد تم تقسيمهم الى 20 مريض مصاب بتليف كبدي تعويضى لوظائف الكبد و 10 مريض مصابين بتليف كبدي لا تعويضى لوظائف الكبد.

ووان مستويات (HOMA-IR) اكبرمن2.5 وجدت فى 8(26.7%) و 8(40%) و 5 (50%) على التوالى و قد وجد ان متوسط HOMA-IR تزيد تدريجيا بين التهاب الكبد المزمن سي تليف الكبد وكان المرضى الذين يعانون من تليف كبدي لا نعويضى لوظائف الكبد اعلى وبدلاله احصائيه فى مستوى الأنسولين وHOMA-IR من تلك مع التهاب الكبدي المزمن كما ان مقاومة الجسم للانسولين تزيد من خطر حدوث تليف الكبد فى المرضى الذين يعاون من فيروس التهاب الكبدي المزمن.

ونستخلص من هذه الدراسة ان مقاومة الجسم للأنسولين تبدأ فى وقت مبكر من الاصابه المزمنه بفيروس التهاب الكبدي سي و تسرع من حدوث التليف الكبدي و مقاومة الأنسولين المقدرة بواسطه HOMA-IR فى مرضى الالتهاب الفيروسي.

الكبدي سي غير المصابين السكرى قد تكون مؤشر كيميائى لتطور التليف و لذلك يمكن ان يمثل قياس HOMA-IR علامه جديده لتحديد مرضى التليف الكبدي الذين فى خطر أكبر للتطور مرض الكبد. ويوصى بتقدير مقاومة الأنسولين بواسطة HOMA-IR و علاج مقاومة الأنسولين اذا وجد فى المرضى الذين يعانون من الالتهاب الفيروسي الكبدي سي لان هذا قد يؤدى الى خفض معدل التقدم فى تليف الكبد.

الكلمات المفتاحية: الكبد الوبائي سي ، السكري، الأنسولين.