

## **Effect Of Glycin ,Camphor and Schiff Base (R-CH=Nar)ON blood protien And Liver Enzymes in The Rats.**

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### **Abstract**

The study aimed to compared the effect of camphor ,glycin and prepared chemical base on the liver enzymes and blood proteins values .32malesand females of wister albino rats were used in the present study . randomly divided into 4 groups(n=8) . the control group was given olive oil only,3 experimental groups injected daily intraperitoneal injection of (75 mg/kg)from (glycin ,camphorand Schiff base )solutied in olive oil . All groups were kept in the same environmental conditions.At the end of 4 weeks all rats were killed and collected the blood serum for analysis .the glycin group significantly decreased in liver enzyme levels (AST,ALT,ALP)but significantly increased in blood proteins parameters levels(TP,GLU,ALB) compared with control group.study showed significance increased in both liver enzymes and blood protiens levels in groups which treated with (camphor & Schiff base )compared with the control group.The present study showed that used camphor and the new Schiff base haved the same effected on the liver enzymes and blood protiens.

**Key words:** glycin .camphor,liver enzymes.total protein

## تأثير الكلايسين والكافور والقاعدة الكيميائية المحضرة على بروتينات الدم وانزيمات الكبد في

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### الخلاصة

هدفت الدراسة الحالية الى المقارنة بين تأثير الكافور والكلايسين والقاعدة الكيميائية المحضرة على مستوى أنزيمات الكبد ومعايير بروتينات الدم في الجرذان المختبرية.صصمت التجربة بأختيار 32من جرذان الحقل المختبري (ذكور واثاث) اختياريا عشوانيا .وقسمت كل 8 جرذان في مجموعة وقد حقنت 3مجاميع التجربة بمادة (الكلايسين ،الكافور والقاعدة الجديدة)كلاً على حدة محلول في سائل زيت الزيتون للتدويب وبمقدار تجريع ( 75ملغم/كيلو غرام) .اما مجموعة السيطرة فقد حقنت فقط بمادة زيت الزيتون .كل المجاميع تم تربيتها نفس الظروف البيئية المختبرية لمدة اربعة اسابيع فيما بعد قتلت وتم سحب عينات الدم لغرض اجراء التحاليل عليها .لوحظ من خلال النتائج أن هناك نقصان معنوي في مجموعة جرذان المحقونة بمادة الكلايسين في معايير أنزيمات الكبد ،لكن توجد زيادة معنوية في بروتينات الدم لنفس المجموعة المحقونة مقارنة مع مجموعة السيطرة .وايضا بينت النتائج الدراسة هناك زيادة معنوية في انزيمات الكبد والبروتينات الدموية في الجموعتين المعاملتين بمادة الكافور والقاعدة الكيميائية المحضرة مقارنة مع مجموعة السيطرة .اضافة الى ذلك اظهرت النتائج بانه استخدام الكافور والقاعدة الكيميائية الجديدة تمتلك تأثير مشابهه على انزيمات الكبد وبروتينات الدم.

**الكلمات المفتاحية:** الكلايسين ،الكافور ،بروتينات الدم وانزيمات الكبد

## **1-Introduction**

Camphor is a ketone white crystalline substance obtained from the tree *Cinnamomum camphora* L., commonly known as camphor tree (camphor wood or camphor laurel), or produced synthetically. It is synthetic and is now available and is being produced for medical, sanitary and industrial usages. Linjawi (2011), Duchene (2003), camphor as a herbal medicine has many various physiological effects. It affects respiratory system, circulatory system, skin, reproductive system, liver and kidney. Enaibe et al (2007), Jadhav et al (2010) camphor also play a role in improvement of immune function. Chanta et al (1978). Glycine, an essential amino acid, has been shown to protect kidney proximal tubules, Miller and Schnellmann (1994), and hepatocytes, Nichols (1994), against hypoxia. Glycine improved the hepatic microcirculation and reduced injury, reflow model in the perfused liver, Zhong et al (1996). Schiff base ( $R-CH=N-Ar$ ) consist of camphor with glycine, Nuha (2016), this response between them have strong biological activity, Barve et al (2006). Alanine aminotransferase (ALT) and Aspartate amino transferase (AST) are the most important enzymes in group of trans-aminases, Gyoubu and Miyazawa (2007), ALT is a specific factor in liver for defining the liver damage. It is only increased in the liver. But AST acts not only as a factor in liver damage but also is increased in heart damage, Thomas (1988), Moss and Henderson (1999), Total protein is measured in serum to give an indication of total immunoglobulin concentration since  $[(total\ protein)-(albumin)]=(globulin)$  of which component is immunoglobulins, Shashi et al (1998), total protein is sometimes included in "liver function test"; some chronic liver disease cause increased in immunoglobulins, which increased total protein, Alada (2000), The main objective of this study to compare between the effects of camphor, glycine and Schiff base on liver enzymes and blood proteins.

## **2- Materials And Methods:**

### **2-1- Materials**

chemicals: (camphor & glycine) procured from sigma-Aldrich, Fluka and BDH used without filtration (or were purchased from Kimya Maved chemical company (animal: Thirty-two wistar albino rats (*Rattus norvegicus*)) (50-60 day old) weighting (200-250g) were obtained from the Animal house of Department of biology, College of science university of Thi-qar, Iraq. Animals were housed in standard plastic cages kept in room temperature of (24-28°C) controlled (12h light/12h dark) condition. with access to rat chow & tap water ad libitum.

### **3-Method**

#### **3-1-Synthesis Of Schiff Base :**

Camphor (20mmol,3.04g) was dissolved in 20 ml of methanol and to this solution was added glycin (20 mmol,1.5g) in 20 ml of methanol and Acohc ml .The reaction mixture obtained was refluxed for 9h .Upon cooling ,the white crystalline powder Schiff base

Thirty\_ two rats were randomly divided in to four groups of 8 rats each one ,The four experimental groups received dialy intraperitoneal injections for 4 weeks-1 . The control group (G1)received (olive oil ;2.5ml/kg/day)only-2The second group(G2) supplemented intraperitoneal injection with glycin(75mg/kg dissolved in 0.4ml from olive oil -3(The third groupm(G3)supplemented intraperitoneal injection with camphor(75mg/kg dissolved in 0.4ml from olive oil( -4The fourth group supplemented intraperitoneal injection with Schiff base (75mg/kg dissolved in 0.4ml from olive oil)

#### **3-2 Sample Collection**

Blood sample were collected (in heparin containing tubes)from the retro orbital venous plexus of all animals and centrifuged at 3000rpm.for 10 minutes .The clear supernatant plasma was harrested and kept at .20c unital biochemical parameters. 3-2Liver enzymes Measurement : Plasma aminotransferase(AST),Alanine aminotransferase (ALT)and Alkaline phoshotatase (ALP)activities were measured (6)using commercial supplied kits(siemens,Germany).arkray(spotchem EZ)apprature.

#### **3-3 Statistical Analysis**

Data were analyzed using the spss for windows (version 17.0).Analysis of variance (one- way ANOVA)was performed to test for any significant differences among groups .The level of significance was set as  $p < 0.05$  for all statistical tests,Tello(2003-4(Results

The serum biochemical parameters of rats obtained in this study are presented in Table (1,2&3).These includes serum liver enzymes (AST,ALTandALP)and (total protein,albumin and glubolin.(

Table (1) explained effect of glycin on blood protein and liver enzymes .The results indicated asignificant increased( $p > 0.05$ ) in Total protien (TP) and Albumine (ALB) in (glycin)group compared with control group. and also we showed There was significant decreased( $p > 0.05$ ) in asparatate aminotransferase ,alanine aminotrasferase and alkaline phosphatase in group rat which treaded with glycin compared with control group, There was non significant in globulin level in group which treated with glycin.

Table(2)we noticed effect camphor on blood protein and liver enzymes. The results showed There was significant increased ( $p < 0.05$ ) in Total protein, Albumine Aspartateaminotransferase, Alanineaminotransferase and Alkaline phosphatase in group rats which treated with camphor compared with control group, There was non significant in globulin level in group compared with control group (Table 2)

Table(3)we showed effect Schiff base on blood protein and liver enzymes. The results showed There was significant increased ( $p < 0.05$ ) in Total protein, Albumine Aspartateaminotransferase, Alanineaminotransferase and Alkaline phosphatase in group rats which treated with Schiff base compared with control group, . There was non significant in globulin level in Schiff base group compared with control group, There was decreased in parameters in schiff base group when compared with camphor group but non significant

**Table (1):** effects of glycine on blood proteins and liver enzymes

Parameters	Mean control	std	Mean glycin	std
Total protein(gm/l)	7.20	±0.22	8.70*	±0.44*
Albumin(gm/l)	3.16	±0.25	3.96*	±0.39*
Globulin(gm/l)	4.18	±0.54	4.21	±0.62
AST(u/L)	5.66	±1.21	6.16*	±1.16*
ALT(u/l)	5.16	±0.75	5.16*	±0.75*
ALP(u/L)	52.16	±4.16	42.33*	±6.83*

mean significant difference at ( $P < 0.05$ ) level.

**Table (2):** effects of camphor on blood proteins and liver enzymes

parameters	Mean control	std	Mean Schiff base	std
Total protein(gm/l)	7.20	±0.22	7.30*	±0.25*
Albumin	3.16	±0.25	3.46*	±0.13*
Globulin(gm/l)	4.18	±0.54	4.15	±0.88
AST(U/L)	5.66	±1.21	20.50*	±3.88*
ALT(U/L)	5.16	±0.75	12.66*	±2.50*
ALP(U/L)	52.16	±4.16	79.33*	±2.50*

mean significant difference at (P<0.05) level.

**Table (3)** effect of Schiff base on blood proteins and liver enzymes

Total protein(gm/l)	7.20	±0.22	7.23*	±0.66*
Albumin(gm/l)	3.16	±0.25	1.90*	±0.16*
Globulin(gm/l)	4.18	±0.54	4.26	±0.20
AST(U/L)	5.66	±1.21	4.50*	±10.76*
ALT(U/L)	5.16	±0.75	21.83*	±6.99*
ALP(U/L)	52.16	±4.16	86.83*	±4.66*

#### 4- Discussion

The present study indicated a significant increase in Total protein and Albumin in the glycine group compared with the control group. These results were in agreement with Alada(2000) and Olaleye et al(1999), which showed the content of glycine is responsible for the high levels of total plasma protein and plasma albumin. The decreased aspartate aminotransferase, alanine aminotransferase and alkaline

phosphatase in group rat treated with glycine compared with control group. This agrees with previous studies indicating that glycine is able to repair liver damage then decreased AST&ALT level enzymes which consider the measurement tool liver cells. Zhong et al (1996) and Nichols (1994). In a liver transplantation model, glycine added to the rinse solution reduced reperfusion injury and improved graft function and survival Bachmann et al (2005), action glycine by blocked increased in  $[Ca^{++}]$  due to increase permeability in Kupffer cells, glycine inhibited tumor necrosis factor (TNF $\alpha$ ) and superoxide production these lead to increased chloride influx which activation of the Kupffer cells and hypothesis to liver cells, Ikejima et al (1997).

The increased in aspartate aminotransferase, Alanine aminotransferase and Alkaline phosphatase in group rats which treated with camphor and Schiff base compared with control group, These results agree with many studies such as, Tung et al (2011) and Kachmor (1970), Normally, plasma aspartate aminotransferase and alanine aminotransferase are low but after extensive tissue damage these enzymes are liberated in to the blood, Kachmor (1970). And amount of aspartate aminotransferase is directly proportional to the number of cells damage and the interval of time between tissue injury and alanine aminotransferase determination, Moss and Henderson (1999). Although camphor has insecticidal, antimicrobial, antiviral and anticancer, in addition to its use as a skin penetration enhancer but camphor is consider a very toxic substance, Chen et al (2013) as well as, administration of camphor influenced the level hepatic and extrahepatic reduced glutathione, Bhatti et al (2011), camphor causes vasodilation in central liver veins Adjene and Enaibe (2002), and other studies showed camphor was oxidized to 5-exohydroxyfenchrone (p450) enzymes, Gyoubu and Miyazawa (2007), or in the study the reason for increasing the enzymes is probably because of camphor which is used, alanine is changed to pyruvate and glutamate by ALT is a factor for recognizing the liver damage, Drotman and Lawhan (1978).

The present study showed increased in Total protein and Albumine in groups which treated with camphor and Schiff base, It could be proposed that the increase in plasma enzymes level may be attributed to increased of cell membrane permeability, Shashi et al (1998), camphor stimulation of TLR-4 receptors by LPS results in a significant increase in the production plasma protein, Lorne et al (2009), The decreased level (AST, ALT and ALP) and (total protein and albumin) in Schiff base group may be due to mixture between camphor and glycine in this Schiff base, Nuha (2016). There was non significant in globulin level in all treated with glycine, camphor and Schiff base groups which agree with the study provided, Shashi et al (1998).

## 5- Conclusion

Based on the results ;it was founded that schiffbase similar work to camphor in effect on the liver enzymes and hematological parameters but the new Schiff base was the lower limitin effected from camphor .therefore .using this new schiffbase instead of camphor dangerous .when it is using cosmetic and pharmaceutical purposes.

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