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Serum Uric Acid level and its Correlation with Depression disorder

مستوى حامض البوليك في الدم وعلاقته مع اضطراب الكآبة

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الملخص

يعد اضطراب الكابة من الاضطرابات النفسية الشائعة التي يؤثر سلبا على افكارنا ومشاعرنا وفي سلوكنا اضافة الى ذلك فان الاكتئاب يسبب الاحساس بالحزن وفقدان الامل والتقدير الواطى للذات.على الاغلب فان هناك مجموعة من العوامل الجينية والنفسية والبيئية اضافة الى العوامل الفسيولوجية. فيما يتعلق بالعوامل الفسيولوجية ودورها في حدوث الاكتئاب النفسي فاننا يمكن ان نقول ان انخفاض مستوى حامض البوليك في الدم يؤدي الى ارتفاع مستوى وطأة مواد التأكسد في الدم, وهذه المواد بدورها تؤدي الى اضطراب الكآبة,ذلك لان حامض البوليك يتمتع بخاصية حماية الخلايا العصبية

بسبب كونه مقاوم للتأكسد. لذا فان العلاج بالأدوية التي تمنع زيادة مستوى مواد التأكسد(الضارة) تساعد على زيادة مستوى حامض البوليك في الدم, و تعالج الاضطراب الاكتآبي لدى المرضى.

اهداف ألبحث:

1- قياس مستوى الحامض البولي لعينة الدراسة قبل وبعد العلاج

2- قياس شدة الاكتئاب لدى عينة الدراسة قبل وبعد العلاج

3- ايجاد العلاقة بين مستوى حامض البوليك في الدم مع اضطراب الكآبة قبل العلاج تبعا للمتغيرات الاتية

- العمر
- الجنس
- الحالة الزوجية
- العادات الغذائية
- دلالة حجم الجسم
- السكن (داخل او خارج مدينة الموصل)

4-دراسة العلاقة بين حامض البوليك واضطراب الكابة قبل وبعد العلاج تبعا لمتغير الجنس

منهجية البحث: شملت الدراسة (100 مريض) من اللذين يعانون من اضطراب الكآبة (30 ذكور \ 70 إناث). وقد تم تشخيص شدة اضطراب الكأبه لدى المرضى قبل وبعد العلاج بواسطة مقياس هاملتون : **Hamilton Depression Rating Scale(HDRS)**

تم قياس مستوى حامض البوليك في الدم للمرضى في المختبرات الخاصة في مدينة الموصل قبل بدء العلاج. وتم متابعة واجراء فحص مستوى حامض البوليك في الدم للمرضى بعد الشهر الثالث من العلاج. كذلك تم دراسة وقياس دلالة حجم الجسم (BMI) والعادات الغذائية(E.H.)

النتائج:

اظهرت الدراسة مايلي : مستوى حامض البوليك عند الذكور اعلى منه عند الاناث قبل البدء بالعلاج ودرجة الدلالة الاحصائية عالية (P-value=0.000). كذلك فانه لاتوجد علاقة بين مستوى حامض البوليك في الدم والمتغيرات التالية: ألوزن, والعادات الغذائية (نباتي \ حيواني) , لدى المرضى قبل البدء بالعلاج. كما أظهرت الدراسة وجود علاقة عكسية واضحة بين مستوى حامض البوليك في الدم وشدة اعراض الكآبة لدى المرضى قبل العلاج وبعد 3 أشهر من العلاج والمتابعة, اذ كان ومستوى الدلالة الاحصائيةعالي (P-value=0.000).

ألخلاصة :

اظهرت الدراسة وجود علاقة عكسية قوية بين انخفاض نسبة حامض البوليك في الدم وشدة اعراض الكآبة لدى المرضى , فكلما زادت نسبة حامض البوليك في الدم بعد تناول العلاج المضاد للاكتئاب بعد الشهر الثالث كلما تحسنت حالة المريض السريرية وعند تطبيق مقياس العالم (هاملتون) على المريض , حيث تصل نسبة حامض البوليك الى نسبتها الطبيعية تقريبا في الدم بعد الشهر الثالث من العلاج.

Abstract

Depression is a common and serious psychological disorder that negatively affects how you feel, the way you think and how you act. Fortunately, it is also treatable. As well as it causes feelings of sadness, hopelessness, lowered self-esteem, reduced energy and vitality; and / or a loss of interest in activities once enjoyed. It can lead to a variety of emotional and physical problems and can decrease a person's ability to function at work and at home. symptoms of depression can vary from mild to severe and can include: Feeling a depressed mood, Loss of interest or pleasure in activities once enjoyed, Changes in appetite , weight loss or gain unrelated to dieting, Difficulty thinking, concentrating or making decisions ,Thoughts of

death or suicide .These symptoms must last at least two weeks for a diagnosis of depression. Depression affects an estimated one in 15 adults in any given year. And one in six people will experience depression at some time in their life. Women are more likely than men to experience depression. Some studies show that one-third of women will experience a depressive in their lifetime. Very often, a combination of genetic, psychological, environmental as well as pathophysiological factors is involved in the onset of a depressive disorder. According to pathophysiological factors; It has been hypothesized that lowered antioxidant status may play a role in affective disorders; thus uric acid could be especially significant in the development of depressive disorders, which have been associated with increased oxidative stress. Many researchers found that: uric acid considered as an a potent antioxidant factor in the body and act as a good scavenger for many harmful radicals in the blood; also it act as a neuroprotective, so that lower of serum uric acid can cause many psychological diseases. Therefore this study investigated the association of uric acid, the greatest contributor to blood antioxidant capacity, with depressive disorder

Aim of research:

This research aims to achieve the following objectives:

1- Estimate the level of serum uric acid of the sample before and after treatment.

2- Measuring the severity of psychological depression of the sample before and after treatment

3- Find the correlation between the serum uric acid level and depressive disorder according to:

A- Age

B- Gender

C- Marital status.

D- Eating habits

E- Housing (inside or outside Mosul)

F -Body mass index

4- Investigate the correlation between the serum uric acid level and depression before and after treatment according to gender

Materials and Methods:

One hundred patients were included in this study whom suffered from depression disorder 30 male(30%) there age is (37.24±9.89) ; 70 female (70%) there age is (34.18± 8.48). The patients are collected in psychiatric private clinic during the period(1June 2018) to (15October 2018). Depression disorder were measured by using the Hamilton Depression Rating Scale(HDRS); (to find if it's mild, moderate. Severe or very severe) before beginning of the treatment; and after 3 month of our follow up of the patients. Uric acid level was measured in plasma for the patients before starting the treatment; and after 3 months of treatment of follow up; by using Tricyclic antidepressant (Treptizol) therapy; in a dose of (25mg for mild cases; 50mg for moderate cases; and 75mg for severe and very severe depressive disorders; as a single or divided dose\day). Body mass index(BMI), and eating habits were detected for all patients were estimated. Patients with hypertension and renal disease were excluded from our study.

Results:

The male serum uric acid level is more than that of female and the difference is significant; there is no significant correlation between; SUA level, severity of depression disorder and; age, marital status, addresses, BMI, eating habit; before treatment between male and female. There is highly (negative) significant difference between SUA level, and severity of depression disorder for the male and female before and after treatment(after 3 month of follow up)

Conclusions :

There is a strong negative correlation between the serum uric acid level and severity of depression disorder. There is increment of serum uric acids level after 3 months from the starting of the treatment by Tricyclic antidepressant therapy (Treptizol); which accompanied by improvement in Hamilton Depression Rating Scale (HDRS) for the depression disorder patients.

Key words: Depressive disorder; Serum uric acid; Hamilton Depression Rating Scale; Body mass index.

Introduction:

Depression is a common and serious psychological disorder that negatively affects how you feel, the way you think and how you act. Fortunately, it is also treatable. As well as it causes feelings of sadness, hopelessness, lowered self-esteem, reduced energy and vitality; and / or a loss of interest in activities once enjoyed. It can lead to a variety of emotional and physical problems and can decrease a person's ability to function at work and at home. (Black et al.,2015)

Symptoms of depression can vary from mild to severe and can include: Feeling a depressed mood,Loss of interest or pleasure in activities once enjoyed, Changes in appetite , weight loss or gain unrelated to dieting, Difficulty thinking, concentrating or making decisions ,Thoughts of death or suicide .These symptoms must last at least two weeks for a diagnosis of depression(Lamers et al.,2011)

Depression affects an estimated one in 15 adults in any given year. And one in six people will experience depression at some time in their life. Women are more likely than men to experience depression. Some studies show that one-third of women will experience a depressive in their lifetime.(Vreeburg et al.,2009)

A recent WHO report predicts that depression will be the leading cause of disability and premature death by 2020, second only to Ischemic Heart Diseases. (Birmaher et al.,2004) (Andreazza et al.,2008)

Very often, a combination of genetic, psychological, environmental as well as pathophysiological factors is involved in the onset of a depressive disorder. According to pathophysiological factors;It has been hypothesized that implicated the role of oxidative stress in major depression. Abnormal levels of antioxidant enzymes and lipid peroxidation in major depression further substantiates the role of free radical in major depression. (Chaudhari et al.,2010)

lowered antioxidant status may play a role in affective disorders; thus uric acid could be especially significant in the development of depressive disorders, which have been associated with increased oxidative stress. (Black et al., 2015) Many researchers found that: Uric acid

considered as an a potent antioxidant factor in the body and act as a good scavenger for many harmful radicals in the blood; also it act as a neuroprotective, so that lower of serum uric acid can cause many psychological diseases. (Chaudhari et al.,2010)

Several investigators have implicated the role of oxidative stress in major depression. Abnormal levels of antioxidant enzymes and lipid peroxidation in major depression further substantiates the role of free radical in major depression Costello et al., 2006)

Neurons are especially vulnerable to free radical attacks; Insufficient defenses with exposure to excess reactive oxygen species (ROS) can lead to neuronal dysfunction and death of neuron. Oxidative stress is one of the important mechanisms that causes the destruction of nerve cells and decrease the volume of hippocampus in patients of major depression.(Garcia et al.,2006)

Uric acid is one of the non enzymatic antioxidants in the body, there levels are modified in major depression. (Gaynes et al.,2007) (Howland et al.,2009)(Irie et al.,2001) Uric acid has neuroprotective effects, owing to its antioxidant properties, it inhibit inflammatory cascades and reduce the permeability of the blood–brain barrier. (Sen ,2007)

Lowered antioxidant capacity, causing increased oxidative stress, may be involved in affective disorders and might be altered by antidepressants therapies. (Chaudhari et al.,2010)(Catherine et al.,2018) There are many pieces of evidence showing that oxidative stress is involved in the pathophysiology of mood disorders. It has been demonstrated that oxidative stress markers are increased in major depressive disorder. (Ngef et al.,2008) It was proposed that the therapeutic effects of mood stabilizers and antidepressant drugs might be at least partly related to the protection against oxidative stress damage in neuronal cells. (Ngef et al.,2008) (Berk et al.,2011) .Uric acid is the most abundant scavenger of free harmful radicals in humans. Elevation of serum uric acid concentration occurs as a physiologic response to increased oxidative stress. (Waring et al.,2001)(Singh et al.,2004) Uric acid increment in the remission phase of major depressive disorder may support the role of uric acid and oxidative stress in the pathology and treatment of mood disorders. (Stinefelt et al.,2005) (Bowman et al.,2010)

It has been suggested that low uric acid levels are associated with the development and progression of a variety of central nervous system (CNS) diseases such as Parkinson's and Alzheimer's disease(Kutzing& Firestein,2008) (Kim et al.,2006) (de Lau et al.,2005) After considering uric acid's ability to suppress CNS damage and neuronal death, it is possible to suggest that rising uric acid in the remission period may help to prevent neuronal damage in mood disorders. (Yu et al.,1998) In parallel, it was proposed that the reduced uric acid level in the acute phase of mood disorders might reflect the reduction of natural antioxidant. (Chaudhari et al.,2010) They found that the depressed patients with lower levels of uric acid had more rapid onset of response to antidepressant treatments. This may be helpful in predicting patient's responses to antidepressant treatments. Accordingly, uric acid, as an indicator of the purinergic and oxidative stress systems, may be a new target for the development of drugs that could accelerate treatment responses in mood disorder. (Ortiz et al., 2015) Serum uric acid (SUA) is the ultimate product of purine metabolism; it is a potent non enzymatic endogenous antioxidant in the body and undertakes 60% of the body's antioxidant reactions.(Machado et al.,2002)The concentrations of serum uric acid determine by a number of demographic factors of which are age, sex, body mass index, socioeconomic class, alcohol consumption, high protein diet, hyperlipidaemia, atherosclerosis, diabetes mellitus, kidney disease and primary hypertension. (Sperlagh et al.,2012) (Talat et al.,2016).

Aim of research:

This research aims to achieve the following objectives:

1- Estimate the level of serum uric acid of the sample before and after treatment.

2- Measuring the severity of psychological depression of the sample before and after treatment

3- Find the correlation between the serum uric acid level and depressive disorder before treatment according to:

A- Age

B- Gender

C- Marital status.

D- Eating habits

E- Housing (inside or outside Mosul)

F -Body mass index

4- Investigate the correlation between the serum uric acid level and depression before and after treatment according to gender

Materials and methods:

Our study was approved by the scientific committee at the College of Medicine, University of Mosul. Formal consent was taken from patients and their family after explanations of the trial to them.

One hundred patients 30 male (30%) there mean age is (37.24±9.89) ; 70 female (70%) there mean age is (34.18± 8.48) included in this study. Depressive disorder were measured by using the Hamilton Depressive Rating Scale (HDRS) for the newly diagnosed patient and after 3months of treatment and flow up; to detect the severity of the depression disorder before beginning of the treatment and after 3 months of treatment, to determined the score of the severity of depression disorder, if it is; mild (8-12), moderate (13-18), sever(19-22) or very severe (≥23) (Williams 1988). **Hamilton Rating Scale for Depression** (**HRSD**) published originally by Max Hamilton; it is a multiple item questionnaire used to provide an indication of depression, and as a guide to evaluate recovery, but not be used as a diagnostic instrument (Hamilton 1980)

The questionnaire content 21 item and it designed for adults and it used to rate the severity of their depression.

Each item on the questionnaire is scored on a 2,3, or 4 point scale, depending on the item, and the total score is compared to the corresponding descriptor(Bagby et al,2004).

Features of scales

A.Cytomatric properties(degree of high validity and reliability

B. The most sensitive measure of response to treatment

C. Need a simple training before using it

The researches extracted the face validity of the scale by striking at a group of specialists in the field of psychology who confirmed the possibility of using the scale after taking some observation regarding the method of applying the scale (Williams ,1988) .

The researches extracted the reliability of the scale by retesting the scale (T-retest), on a sample of 20 elderly patients with a time interval of two weeks ,so that the scale is not the type that depends on memory ,and then calculated the transactions between the grades of individuals in the two tests, where the coefficient between the grades(0.83) is a high reliability coefficient, and here confirms (Cronbach,1964) that (the test which has a coefficient of high reliability is a good measure)(Cronbach, 1964 ,68).

Serum uric acid level was measured for the patients before starting the treatment and after 3 month of treatment and follow up in a private laboratory in Mosul city. The patients were treated by using Tricyclic antidepressant therapy (Treptizole) as a dose (25mg for mild cases; 50mg for moderate cases; and 75mg for severe and very severe cases with depressive disorders; as a single or divided dose\day). Full history taking and clinical examination were done for all the patients; Body mass index(BMI), eating habits were detected for all patients. Patients with hypertension, gout, renal disease were excluded from the study.

Statistical analysis:

The mean, standard deviation (SD) were calculated in patients for each parameter the(t) test used to calculate the differences between two means. ANOVA Test and Post Hoc (Duncan) test were used in analysis of results. The p- value was considered significant if it is(< 0.05).

Results:

The study includes 100 patients, 30 male (30%) and 70(70%) female; the age of the male is ranging between (20-65 years) (mean 36.63±7.80). For female; the age range between (22 – 60) (mean 34.14±8.86). Marital state of the patients are; for male: 13 single,9 married and 8 devoice. For female: 27 single, 32 married and 11 devoice. Their living are; 18 patients

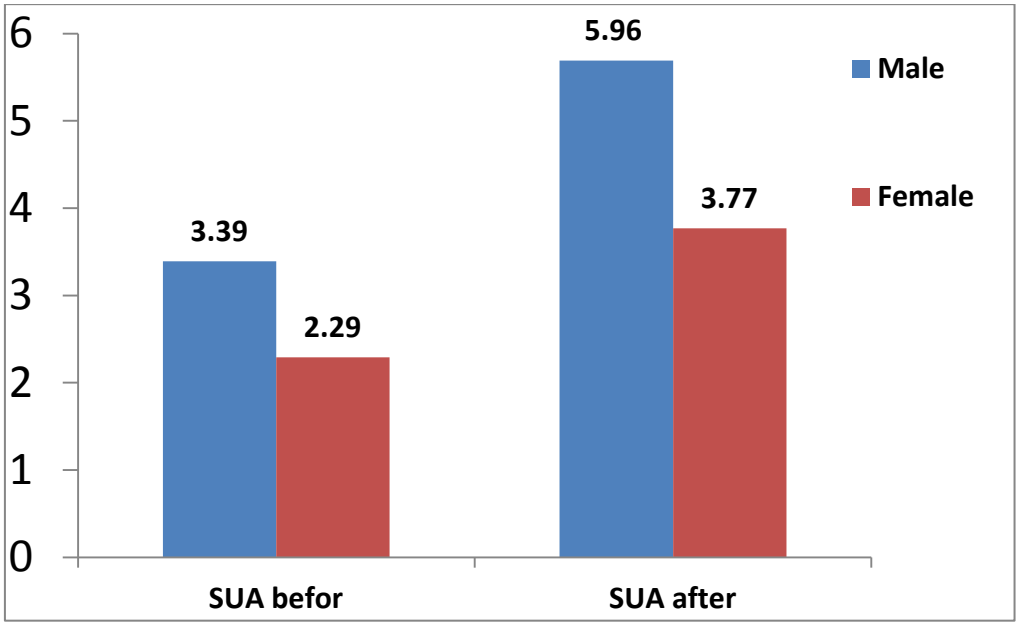
from ruler area and 12 patients from urban area for male patients; 38 patients from ruler area; 32 patients from urban area for female patients. Table(1).

Table (1): Distribution of study sample according to age, sex, marital status and housing

Sex	No. (%)	Age	Marital state			Address	
		Mean±SD	single	married	Devoice	Urban	Ruler
Male	30 (30.0)	36.63±7.80 (20 - 65)	13 (32.5)	9 (22.0)	8 (42.1)	18 (32.1)	12 (27.3)
Female	70 (70.0)	34.14±8.86 (22 – 60)	27 (67.5)	32 (78.0)	11 (57.9)	38 (67.9)	32 (72.7)
Total	100 (100.0)	36.29±8.52	40 (100.0)	41 (100.0)	19 (100.0)	56 (100.0)	44 (100.0)

According to the objectives of the study, level of uric acid and the severity of depression were measured in the study sample before and after treatment and for both males and females as shown in Figs. 1 and 2, 3 respectively.

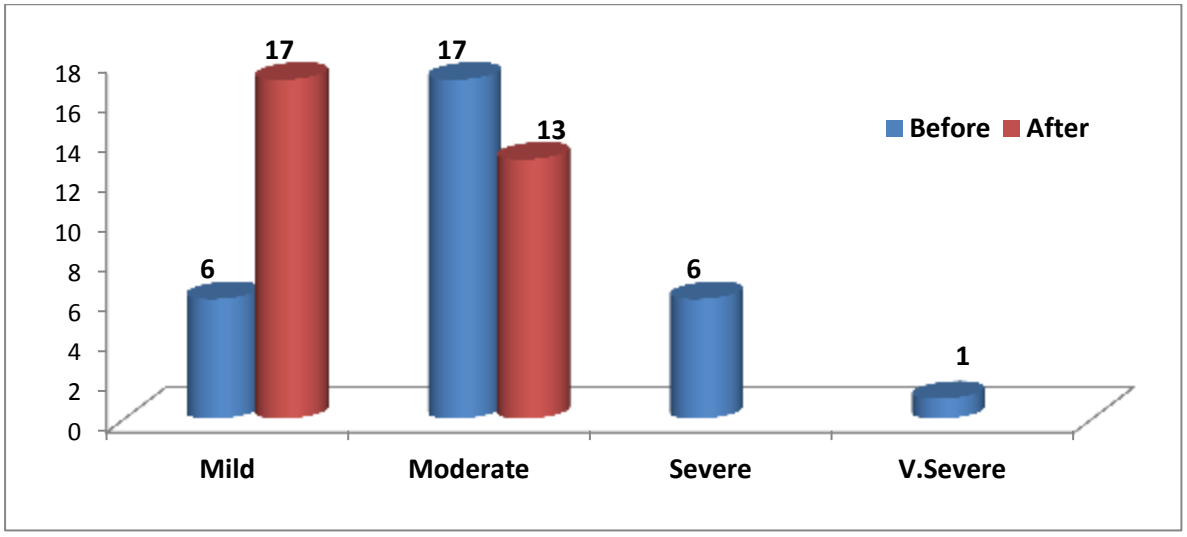
First: the serum uric acid level for male before and after treatment is (3.39±0.14 mg\l); 5.69±0.39 mg\l) respectively, the difference between them is highly significant(P –value is 0.000). The serum uric acid level for female before and after treatment is**(** 2.29±0.19 mg\l)**;** (3.77±0.33 mg\l) respectively, the difference between them is highly significant(P –value is 0.000).



Male	3.39±0.14	5.69±0.39	0.000
Female	2.29±0.19	3.77±0.33	0.000

FIG. (1): SUA level before and after treatment for male and female

Second: The number of male patients with mild, moderate, severe and very severe depression disorder before treatment was; 6,17,5,1,respectively; after the treatment by tricyclic anti depressant (Treptizole), their number became; 17,13,0,0, respectively; This is highly significant(p value=0.000) . Figure(2).



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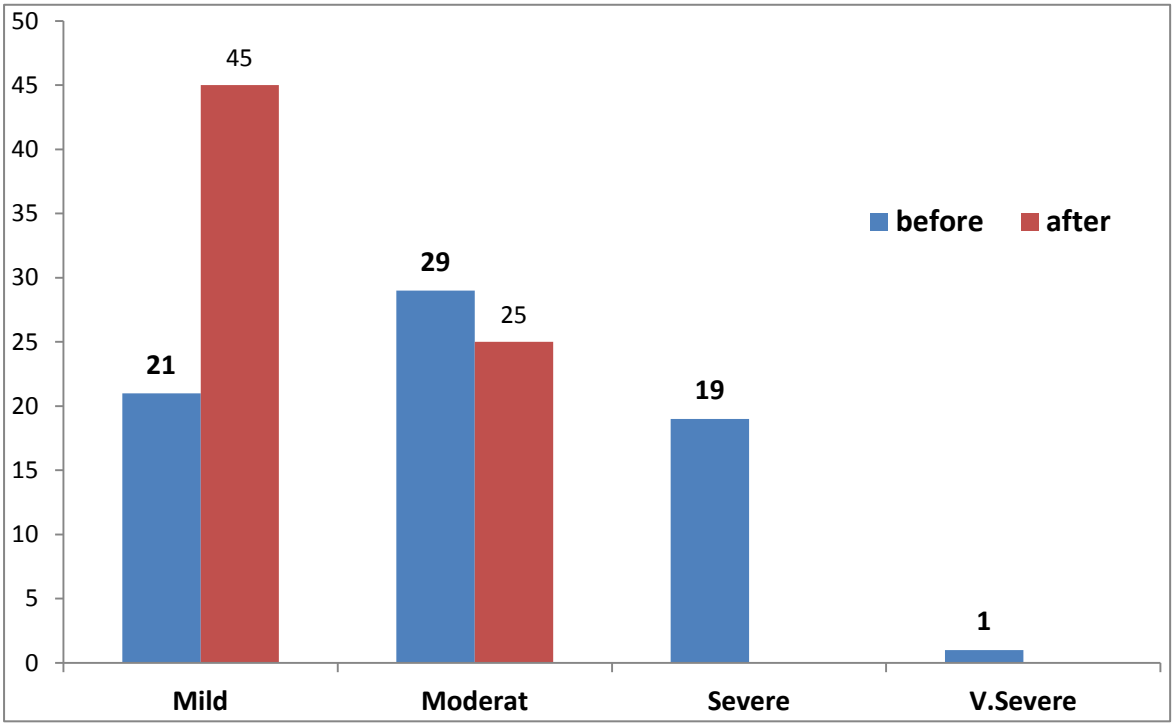
Mild	6	17	0.000
Moderate	17	13	0.000
Severe	6	0	0.000
V. Severe	1	0	0.000

Fig.(2): Number of male with depressive disorder before and after treatment

Third :The number of female patients with mild, moderate, severe and very severe depression disorder before treatment was; 21,29,19,1,respectively; after the treatment by tricyclic anti depressant (Treptizole), their number become; 45,25,0,0, respectively; This is highly significant(p value=0.000) . Figure(3).



Mild	21	45	0.000
Moderate	29	25	0.000
Severe	19	0	0.000
V. Severe	1	0	0.000

Fig.(3): Number of female with depressive disorder before and after treatment

Fourth: The serum uric acid level before treatment, for 21 patients whom age less than 30 years; is (2.52±0.51 mg\dl); and for 79 patients whom age are more than 30 year; is (2.65±0.54 mg\dl); the difference between them is not significant the (P – value) is (0.343). The severity of depression for the same age group is; (15.33 ±4.24); (15.86±4.12) respectively, the difference between them is not significant the (P – value = 0.605).Table (2).

The serum uric acid level before treatment for the 30 male (30%), and 70 female(70%) is (3.39±0.14 mg\dl), (2.29±0.19 mg\dl) respectively; the difference between them is highly significant the (P–value = 0.000). The severity of depression for the male and female is; (16.13±3.79); (15.59±4.28) respectively, the difference between them is not significant the (P– value = 0.546). Table (2).

The serum uric acid level before treatment for the (9 patients) whom body mass index is below normal weight (< 18.5%) is (2.7±0.62 mg\l); for 80 patients whom body mass index is within normal weight (18.5-24.9%) is (2.60±0.53 mg\l); for (9 patients) whom body mass index is above normal weight (25-29.9 %) is (2.69±0.60 mg\l); for (2 patients) whom are obese, body mass index (BMI) (>30%) is (2.75±0.64 mg\l); the difference between them are not significant (p -value is 0.913). The severity of depression for the same groups is; 14.33±3.87, 16.05±4.15, 14.56±3.25 and 14.56±3.25 respectively; also the difference between them is not significant the (P – value =0.529). Table (2).

The serum uric acid level before treatment for the (40 patients) whom are single is (2.71±0.54 mg\l); for (41 patients) whom are married is (2.50±0.46 mg\l);and for (19 patients) whom are devoiced is (2.73±0.66 mg\l); the difference between them are not significant (p-value is 0.137). The severity of depression for the same groups is; 15.28±4.25, 15.61±4.53 and 17.05±2.55 respectively, also the difference between them are not significant (p-value = 0.293). Table (2).

The serum uric acid level before treatment for the (56 patients) whom are from urban area is (2.66±0.53 mg\l); for 44 patients whom are from ruler area is (2.58±0.55 mg\l); the

difference between them are not significant (p-value is 0.430). The severity of depression for the same groups is; 15.93±4.46 and 15.52±3.69 respectively, the difference between them are not significant (p-value is 0.628). Table (2).

The serum uric acid level before treatment for the (25 patients) whom are vegetarians is (2.85±0.56 mg\l); for 75 patients whom are non vegetarians is (2.55±0.51mg\l); the difference between them are not significant (p-value is 0.105).

The severity of depression for the same groups are; 14.60±3.74 and 16.13±4.20 respectively, the difference between them are not significant (p-value is 0.293). Table (2).

Table(2): Distribution of study sample according to age, sex, BMI, serum uric acid level and severity of depression for the patients before treatment.

Parameters	(n=100)	SUA♦ before treatment	P*-value	Severity of depression before treatment	p*-value
	No. (%)	Mean±SD		Mean±SD	
Age(years)					
< 30	21(21.0)	2.52±0.51	0.343	15.33±4.24	0.605
≥ 30	79(79.0)	2.65±0.54		15.86±4.12	
Gender					
Male	30(30.0)	3.39±0.14	0.000	16.13±3.79	0.546
Female	70(70.0)	2.29±0.19		15.59±4.28	
BMI					
< 18.5	9(9.0)	2.7±0.62	0.913**	14.33±3.87	0.529**
18.5-24.9	80(80.0)	2.60±0.53		16.05±4.15	
25-29.9	9(9.0)	2.69±0.60		14.56±3.25	
> 30	2(2.0)	2.75±0.64		15.50±9.19	
Marital status					
Single	40(40.0)	2.71±0.54	0.137**	15.28±4.25	0.293**
Married	41(41.0)	2.50±0.46		15.61±4.53	
Devoice	19(19.0)	2.73±0.66		17.05±2.55	
Housing					
Urban	56(56.0)	2.66±0.53	0.430	15.93±4.46	0.628

Rural	44(44.0)	2.58±0.55		15.52±3.69	
Eating habits					
Vegetarian	25(25.0)	2.85±0.56	0.105	14.60±3.74	0.108
Non-vegetarian	75(75.0)	2.55±0.51		16.13±4.20	

* Independent t- test was used.
** One way ANOVA test was used.
♦ Serum Uric Acid

Fifth: The serum uric acid level for male before and after treatment is (3.39±0.14 mg\l); 5.69±0.39 mg\l) respectively, the difference between them is highly significant(P –value is 0.000). The serum uric acid level for female before and after treatment is**(** 2.29±0.19 mg\l)**;** (3.77±0.33 mg\l) respectively, the difference between them is highly significant(P –value is 0.000).Table(3).

The severity of depression for male before and after treatment is (16.13±3.79); (11.53±2.58) respectively, the difference between them is highly significant (P –value is 0.000); the Severity of depression for female before and after treatment is (15.59±4.28); (11.31±2.74) respectively, the difference between them is highly significant (P –value is 0.000). Table(3).

Table (3): Serum uric acid level and Severity of depression for male and female before and after treatment with Tricyclic anti depressant (Treptizol) therapy.

Parameters	**Sex**	**Before treatment**	**After treatment**	**P*-value**
SUA	**Male**	3.39±0.14	5.69±0.39	**0.000**
	Female	2.29±0.19	3.77±0.33	**0.000**
	Total	2.62±0.54	4.35±0.95	**0.000**
Severity of depression	**Male**	16.13±3.79	11.53±2.58	**0.000**
	Female	15.59±4.28	11.31±2.74	**0.000**
	Total	15.75±4.13	11.38±2.68	**0.000**

* Paired t- test was used.

Discussion:

Our study consist of 100 patients with depression disorder; 30 male (30%), 70 female (70%); the mean age of the male patients are (37.24 ±9.89 year); and for female(34.18±8.49 year).

This study show: low serum uric acid level for the newly diagnosed depression disorder Patients (before treatment); and its level is higher in males than females, the P value is (0.000), and this is mimic the other studies.(Chaudhari et al.2010) (Yu,et al.1998) (Kowatch et al.2005)(Te-Chang et al.2015)(Fields et al.2006) (Ulrich et al.2012)

the study reveals that: There is mild difference in serum uric acid level for vegetarians patients and non vegetarians patients is not significant, the P value is (0.01); this may be due to the fact that the non vegetarians did not consume non vegetarian meals regularly, and this mimic other study.(Usha et al.2013).

The study also show that: the serum uric acid level correlation with the body mass index (BMI),before treatment, among the depression disorder patients are not significant and this is not mimic other study. (Wang et al.2014) (Yue et al.2012)

And this may be due to the fact that; only some patients in our study are overweight or obese.

The low serum uric acid level in newly diagnosed depressive disorder subjects show: highly significant increment after three months of treatment by tricyclic antidepressant (Treptizole) therapy, the P- value is (0.000); accompanied by improvement in Hamilton Depression Rating Scale (HDRS) for the patients, the clinical improvement of depression disorder for the patients parallel to increment of serum uric acid level, and this is mimic the other studies. (Chaudhari, et al.2010) (Gaynes et al.,2007) (Ortiz et al.,2015)(Machado-Vieira et al.2002)

That proof the involvement of uric acid in the pathogenesis and treatment of depression disorders, this rising considered as an indicator of the antioxidant defense increment in the course of the treatment. Therefore, it can be proposed that a uric acid increment during the treatment course for depression disorders may be a marker for monitoring successful treatment of this disorder. Moreover, lower uric acid levels may be a predicting factor for

accelerated onset of response to antidepressants. (Chaudhari, et al.2010) (Gaynes et al.,2007) (Sperlagh, et al .2012).

Conclusions:

There is strong negative correlation between the severity of depression disorder and serum uric acid level. In which there is low level of serum uric acid, before treatment, then there is increment of serum uric acids level after starting the treatment by anti depressant (Treptizole) therapy, where it normalized after three month of treatment, these increment of serum uric accompanied by improvement in Hamilton Depression Rating Scale (HDRS) for the depression disorder patients.

Recommendations:

In future study we try to select equal number of male and female patients with depression disorder, to get better statistical analysis.

Also we try to select a control from normal population volunteers for comparison with the our patients (such as 100 patients and 50 subjects as a control).

We suggest also to follow our patients for 6 months; for whom we must do SUA level test and HDRC every 2 months, to get more perfect data.

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