Study of metabolic syndromr parameters on group of some iraqi people and effect of antidiabetic and antihypertensive drugs on the parameters.

Mahdi S Hamed Al-jebory, MS.Biochemistry ,College of Dentistry
N. A. Naji . Biochemistry ,College of science
M. S. Abdulla. College of medicine

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Abstract

Aims: To compare parameters in Iraqi subjects with Metabolic syndrome , without metabolic syndrome, and comparing the parameters between two groups of the patients with metabolic syndrome the first group without drug but the second group were using drug. **Method:** Study were carried on 60 Iraqi Subjects ,40 of them with metabolic syndrome (20 of the patient did not use any drugs while 20 of the patient used drugs and the rest were control group) . All Study subjects were taken from Balad hospital .The study measured age , Wc , DBP , SBP , FBG , TG , Cholesterol, HDL , LDL , VLDL , and UA. **Results:** There are high significant difference between control and study group regarding the following parameters age, Wc , DBP, SBP, FBG ,TG ,HDL, and UA where P values were less than (0.05) .but Cholesterol, LDL, VLDL were more than 0.05 no significant. Comparing treated group with not treated group, found that high significant for DBP , SBP ,FBG ,TG and VLDL with P value less than (0.05) but age , WC ,Cholesterol , HDL , LDL and UA with p value more than (0.05) no significant. **Conclusions:** In metabolic syndrome WC, blood pressure, FBG and TG were increased but HDL was decreased. All parameters decreased when used the drug in the metabolic syndrome. Except HDL increased after used the drug.

دراسة متغيرات Metabolic syndrome على مجموعة من العراقيين و دراسة تأثير العقارالمضادر لمرض السكري و ارتفاع ضغط الدم عليهم

مهدي صالح حمد الجبوري نزار احمد ناجي محمد شريف عبدالله

الملخص

الاهداف مقارنة مجموعة من المرضة العراقيين بمرض Metabolic syndrome مع مجموعة غير مصابة باي مرض من ثم تم مقارنة مجموعة المرضى بمجموعة من المرضى الدين يتعاطون العلاج طرائق العمل والعينات 60 شخص تم اختيارهم لاجراء الدراسة 40 مريض بمرض Metabolic syndromeحيث ان20 من المرضى بدون اي عقار بينما 20 مريض مع العلاج في حين ان 20 الباقية تمثل مجموعة السيطرةز تم قياس العمر و الخصروالضغط و السكر و الدهون الثلاثية والكولسترول و HDLو LDL و VLDL و اخيرا UA للمجاميع حيث ان العمر تراوح بين 40 الى50 للمرضة اما للاصحاء (مجموعة السيطرة) كان من41الى 65 سنة جميع المرضة تم اخد العينات منهم من مستشفى بلد . النتائج هناك فرق معنوي عالي بين المرضة الدين لاتعاطون اي علاج و مجموعة السيطرة (الاصحاء) حيث ان قيمة P value اقل من 0.05 للعوامل العمر و الخصروالضغط و السكر و الدهون الثلاثية و UA HDLولكن LDL و VLDL A والكولسترول اكبر من 0.05 . اما بالنسبة لمقارنة بين مجموعة المرضة المستخدمين للعلاج مع المرضى غير

المستخدمين للعلاج فوجد فرق معنوي عالي للعوامل DBP,SBP,FBG,TG,HDL و VLDL حيث ان قيمة Pvalue كانت اقل من 0.05 اما العوامل age,WC,Ch,HDL,LDL و UA اكبر من 0.05 الاستنتاجات في حالة المرضة تزداد قيم الخصر و الضغط و السكر و الدهون الثلاثية ولكن HDLيتناقص عن الحد الصبيعي .ان تعاطي العلاج يؤدي الى خفض جميع المتغيرات الى الحد الطبيعي في حين يزيد من HDL ليجعله في المستوى الطبيعي

Introduction

Metabolic syndrome is characterized by a clustering of metabolic abnormalities which leads to increased cardiovascular disease and all-causes mortality.1 The five generally accepted features of metabolic syndrome are obesity, insulin resistance, dyslipidemia [including increased triglycerides and decreased HDL], impaired glucose tolerance, and hypertension. The focus of metabolic syndrome is given to visceral obesity,2 which is considered the pivotal alteration according to the International Diabetes Federation,3 and to atherogenic dyslipidemia, which covers two of the five diagnostic criteria. The prevalence of MS is increasing worldwide in parallel with the alarming rise of obesity.4 -7

Subjects and Methods

The (60) subjects who lived in Balad city in Iraq who participant in the study (30 of them were males while 30 of them were females) .The subjects were divided into : Twenty of the patient subjects had been treated with antidiabetic "Metformin" and antihypertensive drugs" Captoral " , twenty patient subjects had not been treated and the last twenty were regarded as control group . They were frequently monitored and health data was collected afterward. Ages ranging from (40) to (60) with a roughly equal gender representation. 20 of the sample was taking drugs and the other 20 were not. Data such as total cholesterol, high density lipoprotein (HDL), low density lipoprotein (LDL), triacylglycerides, fasting blood glucose UA prior to each and every three to four months scheduled visit with the provider. Blood pressure, and abdominal girth (wc) measurements were all taken on the scheduled appointment day.

Data were stored and analysed using SPSS version 18 package (SPSS, Evanston, IL, USA) for Windows. Biochemical parameters not normally distributed were analysed after being logarithmically transformed. Student's unpaired t -test or one way ANOVA compared differences between groups. Simple and partial correlation coefficients between the variables were determined and multiple regression analysis was performed to determine relationships between variables of interest. Data are expressed as mean and standard deviation (SD) or median (range); statistical significance was accepted at $P< 0.05$.

Results

The means ± standard error of means (SEM) among Girth , DBP , SBP , FBS (fasting blood sugar), Cholesterol , HDL (high-density lipoprotein), LDL

(low-density lipoprotein) , TG (triacylglycerides.) and UA(Uric acid) in table (1) compare control group with study group(subjects with metabolic syndrome) where measured P value for each pairs. in the table (1) high significant between control and study group parameters age,Wc,DBP,SBP,FBG,TG,HDL, and UA where P values were less than (0.05) .but Ch,LDL,VLDL were more than 0.05 no significant.

Table (2) compared the Study group without any drug with Study group for patients who took a drugs for pressure, DM,Dyslipidemia(hyper triglyceride or lowring HDL) and drug for hyperureciemia.and measured P value for each pairs. in the table comparing treated study group with not treated study group were found that high significant for DBP,SBP,FBG,TG, and VLDL with P value less than 0.05 but age, WC, Ch, HDL, LDL, and UA with p value more than 0.05 no significant

Table(3)Showed the correlation among the parameters for study group for patients with drug(treated patients)in the table the correlation were with correlation for positive value but no correlation for negative value. Table(4) showed the linear regression among the parameters for treated study group using age as dependent parameter ,95% of 95.0% Confidence Interval for B, Standardized Coefficients, and Un standardized Coefficients

Discussion

In the present study the diastolic blood pressure decreased after treated with antihypertensive drug for that the DBP (95.±12.4 mmHg) for patients without drugs, while (80±3.8mmHg) for treated patients with very high significant (P value = 0.0001),also systolic blood pressure decreased for patients treated with antihypertensive drugs from (152.5±24.8 mmHg)to(127.5±4.6 mmHg) with very high significant (P value = 0.0001).

In the previous studies, Schulz et al8 showed that after tweleve weeks administration of captopril, a reduction of 11.2±11.4 mmHg in diastolic blood pressure and 15.6± 20.6 mmHg in systolic blood pressure was observed in a number of hypertensive patients .Elving et al9demonstrated a reduction of systolic /diastolic blood pressure of 11/7 mmHg after 6 weeks therapy with captopril in 23 diabetic patients with mild to moderate hypertension . Another studies performed by Aberge et al10demonstrated that the average supine blood pressure reduction in 23 hypertensive patients after eight weeks therapy with captopril was 29/21 mmHg and Elving et al9demonstrated a reduction of systolic /diastolic blood pressure of 15.21/12.26 mmHg. results are more than the results of present study which

Al-Rawi *et al* 11 demonstrated that systolic and diastolic blood pressur decreased from 146.76±6.58/93.33± 3.61mmHg to 131.55±9.27/81.07±5.13 mmHg.

The results of the present study are similar to results demonstrated Schulz et al, and more than the results obtained by Elving *et al*.

In the present study found very highly significant (P value =0.0001)when comparing fasting plasma glucose in metabolic syndrome patients who were using the drugs with that in metabolic syndrome patients who were not using drugs.

The present study was in agreement with Goonatilake et al 398 , Buse et al 13 Eleftheriadou et al 14 and Wulffele et al 15 and Granberry et al 16 who found antidiabetic drugs(metaformin drug) improvement FBG ,lowered BP (SBP and DBP), TGs, TC, and LDL-C, and increased HDL-C from baseline.

The study did not find significant when comparing(HDL-C and LDL-C) of the patients who were using drugs with that for patients who were not using drugs. Pollare *et al* 17 demonstrated little or no change in serum lipid in patients with hypertension after therapy with captopril. These studies were in line with present study .

Conclusions

The parameters (WC, DBP, SBP, FBG, TG, Ch, LDL,VLDL and UA) increase in metabolic syndrome, While HDL decreases in the disease.

All parameters decreased when used the drug in the metabolic syndrome. Except HDL increased after used the drug.

References

1-Moreno LA, Pineda I, Rodriguez G et al. Leptin and metabolic syndrome in obese and non-obese children. Horm Metab Res. 2002; 34 : 394-399.

2. Grundy SM, Brewer HB Jr, Cleeman JI, Smith SC Jr, Lenfant C. American Heart Association; National Heart, Lung, and Blood Institute. Definition of metabolic syndrome: report of the National Heart, Lung, and Blood Institute/American Heart Association conference on scientific issues related to definition. Circulation. 2004;109(3):433–438.

3. Alberti KG, Zimmet P, Shaw J. IDF Epidemiology Task Force Consensus Group. The metabolic syndrome–a new worldwide definition. Lancet. 2005;366;9491:1059–1062.

4. Ford ES, Giles WH, Dietz WH. Prevalence of the metabolic syndrome among US adults: findings from the third National Health and Nutrition Examination Survey. JAMA. 2002;287;3:356–359.

5. Magkos F, Yannakoulia M, Chan JL, Mantzoros CS. Management of the metabolic syndrome and type 2 diabetes through lifestyle modification. Annu Rev Nutr. 2009;29:223–256.

6. Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA. 2001; 285:2486-2496.

7-The-International Diabetes Federation (IDF) http://www.idf.org/ Metabolic Syndrome: The Costliest Condition You've Never Heard Of Afflicts Nearly One in. (2005).

8-Schulz J,Bech J,Pedersen EB,Zavala R,Ruiz M,Muller GA.Tolerability and antihypertension efficacy of losartan versus captopril inpatients with mild to moderate hypertension and impaired renal function.Cli Drug Inverst.19:2000:available.

9-Elving LD,de Nobel E,Van Lier HJ,Thein T,Comparison of the hypertensive effects of Captopril and atenolol in the treatment of

hypertension in diabetic patientic patients.J.Clin.pharmacol.,1989;29:316-320

10-Aberge H,Frithz G,Morlin C.Comparison of Captopril (SQ14225)with hydrochlorothiazide in treatment of essential hypertension .1981: Int, J. Cllin .pharmacol. Ther. Toxicol. 19: 368-371.

11-Al-Rawi N S. metabolic effects of Captopril and Amlodipine in over-weight hypertensive patients,2010:74-80,

12-Goonatilake R, Dori J D . Rosenow, Irma A. Lara, Horacio Palacios, Gustavo E. et al. The Metabolic Syndrome in Diabetic Hispanic Adults and the Role ofSecondary Actos Treatment in Insulin Sensitivity Based on Gender, International Journal of Collaborative Research on Internal Medicine & Public Health. 2009; Vol. 1 (10) : 233-247 | 2 3 2

13-Buse JB, Tan MH, Prince MJ, Erickson PP., The effects of oral anti-hyperglycaemic medications on serum lipid profiles in patients with type 2 diabetes, Diabetes Obes Metab. 2004;6(2):133-56.

14. Eleftheriadou I, Grigoropoulou P, Katsilambros N, Tentolouris N: The effects of medications used for the management of diabetes and obesity on postprandial lipid metabolism. Curr Diabetes Rev .2008;4:340-356.

15-Wulffele MG, Kooy A, de Zeeuw D, Stehouwer CD, Gansevoort RT: The effect of metformin on blood pressure, plasma cholesterol and triglycerides in type 2 diabetes mellitus: a systematic review. J Intern Med .2004; 256:1-1.

16- Granberry MC, Fonseca VA: Cardiovascular risk factors associated with insulin resistance: effects of oral antidiabetic agents. Am Cardiovasc Drugs. 2005; 5:201-209.

17-Pollare T,Linthell H,Berne C,A comparision of the effects of hydrochlorothiazide and captopril on glucose and lipid metabolism in patients with hypertension,N .Engle.J.Med.,1989;321;868-873.

Table (1)Compare parameters with and without Metabolic syndrome.

Parameters	MS (-) no.20	MS (+) no.20	Pvalue
Age(year)	53.7±12.3	45.75±5.4	0.0001
WC(cm)	82.1±11.4	110.9±14.1	0.0001
DBP(mmHg)	80±3.8	95±12	0.0001
SBP(mmHg)	127.5±4.6	152.3±5.2	0.0001
FBG(mmol/L)	99.8±13.8	93.4±13.2	0.0001
Cholesterol(mmol/L)	4.8±1.7	5.04±0.9	NS
TG(mmol/L)	1.2±0.3	2.1±0.6	0.0001
HDL(mmol/L)	1.33±0.3	2.2±0.9	0.001
LDL(mmol/L)	2.9±1.5	1.8±0.8	NS
VLDL(mmol/L)	0.53±0.16	0.9±0.8	0.362
UA(mmol/L)	297.8±92.8	242.4±84.7	0.003

Table (2) Comparing parameters with and without treating patients

Parameters	MS with Drug	MS without Drug	Pvalue
no.	20	20	
Age(year)	53.7±12.3	59.8±10.3	NS
WC(cm)	110.9±14.1	112.9±17.2	NS
DBP(mmHg)	80±3.8	95.±12.4	0.0001
SBP(mmHg)	127.5±4.6	152.5±24.8	0.0001
FBG(mmol/L)	99.8±13.8	168.7±65.8	0.0001
Cholesterol(mmol/L)	4.8±1.7	4.4±1.1	NS
TG(mmol/L)	1.2±0.3	2.6±2.1	0.01
HDL(mmol/L)	1.33±0.3	1.27±0.5	NS
LDL(mmol/L)	2.9±1.5	2.03±1.33	NS
VLDL(mmol/L)	0.53±0.16	1.13±0.9	0.01
UA(mmol/L)	297.8±92.8	343.2±33.7	NS

Table (3) Linear regression using the age as dependement parameter for treating group .

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	112.628	147.304		.765	.464	-220.595	445.852
	wc	.010	.259	.012	.040	.969	-.576	.597
	DBP	1.152	1.098	.360	1.049	.321	-1.332	3.636
	SBP	-.870	.754	-.330	-1.154	.278	-2.574	.835
	FBG	-.142	.336	-.159	-.422	.683	-.903	.619
	Ch	-13.970	21.051	-1.671	-.664	.524	-61.591	33.651
	TG	7.573	121.497	.224	.062	.952	-267.273	282.419
	HDL	12.613	21.240	.365	.594	.567	-35.435	60.661
	LDL	12.648	20.595	1.572	.614	.554	-33.940	59.237
	VLDL	-15.799	284.661	-.207	-.056	.957	-659.746	628.148
	UA	-.047	.049	-.352	-.958	.363	-.158	.064