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The variation between Angiotensin-Converting Enzyme Inhibitors (A.C.E. Inhibitors) and Angiotensin II Receptors Antagonists (A.II R.A.), in C.O.P.Ds. and Hypertensive patients

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ABSTRACT

This study reflects that both A.C.E. inhibitors and A.IIR.A. had been reduced the hypertension in a total 281 patients, that A.C.E. inhibitors had significant results 175(62.27%), more than A.IIR.A. 106(27.72%) in treatment of hypertension in those C.O.P.D. patients with ages ranged between (40-70) years old. Also, we found that there was some degree of serum lipids reduction in those patients which were treated by either A.C.E. inhibitors 22(8.185%), or by A.IIR.A.24(8.540%), with no significant different results in this reduction of serum lipids in both A.C.E. inhibitors and A.IIR.A..

INTRODUTION

Renin is an enzyme produced by the kidney in response to a number of factors, including adrenergic activity (β1-receptros) and sodium depletion. Renin converts a circulating glycoprotein (angiotensinogen) into the biologically inert Angiotensin I, which is then changed by Angiotensin Converting Enzyme (A.C.E. or Kininase II) into the highly potent vasoconstrictor Angiotensin II, A.C.E. is located on the luminal surfaces of capillary endothelial cells, mainly in the lungs, and there are also renin-angiotensin system in many organs, e.g. brain, heart, the relevance of which is uncertain.Angiotensin II acts on two G-protein coupled receptors, of which the angiotensin in "AT" subtype account for all the classic and actions of angiotensin. As well as vasoconstriction these include stimulation of aldosterone production by the adrenal cortex. It is evident that angiotensin II can have an important effect on the blood pressure. In addition, it stimulate cardiac and vascular smooth muscle cell growth contributing probably to progressi hyperten initiated.

coupled to inhibition of muscle growth or proliferation, but appears of minor importance in the adult cardiovascular system. The recognition that A.T.1-receptor subtype is important target for drugs antagonizing angiotensin II has lead, a little confusing, to two alternative nomenclatures for these drugs, either A.T.1-receptor blocker, or angiotensin II receptor antagonists (A.II R.A.).Bradykinin, is also a substrate for A.C.E. Potentiating of Bradykinin contribute to the blood pressure lowering action of A.C.E. inhibitors in patients with low-renin cause of hypertension. Either bradykinin or one of neurokinin substrate of A.C.E. may stimulate cough.The A.T.1 blockers differ from A.C.E. inhibitors in having no effect on bradykinin and do not cause cough. Those that achieve complete blockade of receptor are slightly more effective than A.C.E. inhibitors at preventing angiotensin II vasoconstriction**(1).**The angiotensin – converting enzyme (A.C.E.) inhibitor: involve (benazepril, captopril, enalopril, lisinopril, fosinopril, moexipril, perindopril, quinapril, ramipril, and trandopril), which are not clearly used in pregnancy, or in caution ;while A.II.R.A. involve:- (olmesartan, valsartan, candisartan, eprosartan, irbesartan, losartan, telmisartan and valsartan), which are absolutely contraindicated in 2nd and 3rd trimester of pregnancy because of fatal injury immediately if pregnancy detected**(2).**The most indications of these groups of agents involving treatment of hypertension, treatment of heart failure in which the A.T.1 blockers have not yet been introduce for treatment of heart failure**(3),** diabetic nephropathy, in which A.C.E. inhibitors appear to have a specific renoprotective effect, possibly because of the role of angiotensin II in driving underlying glomerular proliferation in these patients**(4)**. Also they are widely used following incidence of heart failure**(5).**They have many caution in their uses mainly angioedema**(6)**.

PATIENTS and METHODS

A total 281 patients were managed (investigated and treated) in Al-Hussein Teaching Hospital in Thi-Qar government. All the patients which were investigated, had been complaining from hypertension, hypercholesterolemia, increased serum triglycerides, increased L.D.L., and C.O.P.D., as confirmed by their history, clinical examinations, as well as C.X. Rays, T.L.P.T. (total lipid profile tests), and P.C.V. were also done for them.All of those patients which were investigated and managed, with ages ranges between (40-70) years Table(No.1).

DOSSAGE AND DURATION OF TREATMENT

We into two groups; the first group were

(175) patients were treated by "Captopril" in a doses either 50mg/day, or twice daily; or treated by "Lisinopril" in a doses of 10mg/day, or 20mg/day as a single dose; and the second group were treated by either "Losartan" in a dose 80mg/day, or 160mg/day as single dose also; or treated by "Candisartan" in a doses either 40mg/day, or 80mg/day as a single dose also(**1&2)**. Table (No.1).Those patients, were treated by these anti-hypertension drugs for 2 months, and followed up were done for them. The every new results of their investigations mainly measuring B.P., T.L.P.T., were registered and compared during each visit, and according to these results of their B.P. measurement and laboratory results of their serum T.L.P.T., were used in this study.

RESULTS

In this study we found the number of patients which were treated by either "Captopril" or "Lisinopril" were 175(62.5%) patients, in which their high B.P. responded well to the treatment by one of the two mention drugs, when compared with 106(37.72%) patients, which were treated by either "Losartan" or by "Candisartan" Table (No.1).Also we found that, there were some reduction of the serum lipids, mainly serum Cholesterol, Triglyceride and Low density Lipoprotein(L.D.L.), in both groups, that 23(8.185%) patients out of the total 281 showing some reduction in serum lipids, and the serum lipids reduction in patients who were treated by either Losartan or Candisartan were 24(8.540%) patients, (which were slightly more reduction results than the first group which treated by either "Captopril" or "Lisinopril") out of the total 281 patients Table (No2) and Table (No.3).That in both "Captopril" and "Lisinopril", the reduction of serum cholesterol were 14(60.86%) patients, serum triglyceride were 5(27.73%) patients, and the reduction in L.D.L. were 4(17.39%) patients, when compared with those patients which were treated by A.II R.A. (Losartan or Candisartan), that serum cholesterol reduced in 12(50%) patients, and the serum triglycerides reduced in 5(20.83%) patients, while the serum reduction for L.D.L. were in 7(29.16%) patients. Table (No2) and Table (No3).

DISCUSSION

Although hypertension may occur secondary to other disease processes, more than 90% of the patients have essential hypertension, a disorder of unknown origin affecting the blood pressure-regulating mechanism(**7**).Chronic pulmonary diseases are the leading causes of death c
cases, I
C.O.P.D

that the number of patients who were treated and improved well from hypertension by A.C.E. inhibitors, were 175(62.27%), which is significant result, when compared with those hypertensive patients who were treated by A.IIR.A. 106(37.72%), this result is accepted by Spence J.D., et al, that, recently, A.C.E. inhibitors have been used for the treatment of hypertension in patients with heart failure when combined with loop diuretics, more effective than angiotensin II receptor agonist(**9**); also in agreement with Becaterina R. et al, that they found; the incidence of A.C.E. inhibitors were mostly used in elderly patients, mostly those who were emphysematous, with increased pulmonary hypertension, which are superior to β-blockers, calcium channel blockers, or A.IIR.A., mainly when used together with diuretics(**10**). Also we found in this study, that there were some degree of cholesterol, triglyceride, and L.D.L. reduction in some patients who were treated by either: A.C.E. inhibitors or A.IIR.A.; So we found that 23(8.185%) patients out of the total 281 patients reflected a reduction of serum lipids which were treated by A.C.E. inhibitors, that serum cholesterol decreased in 14(60.86%) patients, and serum triglyceride reduced in 5(27.73%) patients, while serum L.D.L. reduced in 4(17.39%) patients Table (No.2). While 24(8.450) out of 281 patients reflected a reduction in their serum lipids for those who were treated by A.IIR.A., that the serum cholesterol of those patient reduced in 12(50%) patients, and serum triglycerides reduced in 5(20.83%) of the patients, while serum L.D.L. reduced in 7(29.16%) patients, Table(No.3). That in some studies; they found the beneficial effects of anti-hypertensive agents on the cardiovascular system can be counterbalanced by the induction of metabolic disorders, such as hyperlipidaemia, that all total cholesterol, triglyceride, and L.D.L. reduced equally in both A.C.E. inhibitors and in A.IIR.A. treated animals in this experiments(**11&12**) . This study is also in agreement with Keidar S., et al, who found in their study that after12 weeks, the arteries were harvested for histomorphometry and immunohistochemistry, the A.C.E. inhibitors and A.IIR.A. significantly reduces cholesterol, triglyceride and LDL levels and is neutral on glucose metabolism, mainly in moderate hypertension observed in their study, that decrease in serum triglycerides (T.G.) and total cholesterol (T.C.) and A.C.E. activity with valsartan treatment were more than 5, 10, and 20%, respectively, in comparison with cholesterol group; with benzapril--treatment, T.G. level lower than in cholesterol group, however, there was r

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accepted with Spence J.D., Westlie

M. R. Breslow J.L., et al, who were found that some specific beta-adrenergic blockers, such as carvedilol, have been shown to posses possible antioxidant properties and may prevent L.D.L. oxidation, thereby slowing the atherosclerotic process, and this activity may be found in some A.C.E. inhibitors drugs and some angiotensin 11 antagonists agents but in low ratio(**14**).So we conclude from this study that A.C.E. inhibitors had significant results in treatment of hypertension, than A.II.R.A which had low percentage result than A.C.E. inhibitors in the treatment of hypertension, also we conclude that there was some degree of reduction of serum lipids for both A.C.E. inhibitors and A.IIR.A. in which there was no significant difference between A.C.E. inhibitors and A.IIR.A. in this reduction.

ABBREVIATION:

A.C.E : Angiotensin-Converting Enzyme.

A.II R.A. : Angiotensin II Receptors Antagonists.

C.O.P.Ds. : Chronic Obstructive Pulmonary Diseases.

L.D.L : Low Density Lipoproteins .

T.G : Triglycerides.

T.L.P.T: Total Lipid Profile Test.

Table(No.1): Distribution of the patients who respond well to either A.C.E. inhibitors, or to A.II R.A.:-

Ages	40-45	46-50	51-55	56-60	61-65	66-70	Total
No. of patients who were treated with ACE inhibitors	42 (24%)	34 (19.43%)	29 (16.57%)	24 (13.17%)	35 (20%)	11 (6.28%)	175 (62.27%)
No. of patients who were treated with AIIRA	30(28.30%)	21(19.81%)	26(24.53%)	11(10.38%)	10(9.43%)	8(7.55%)	106(37.72%)
Total	72(25.62%)	55(19.57%)	55(19.57%)	35(12.45%)	43(16.01%)	19(6.76%)	281(100%)

Table (No.2): distribution of cholesterol, triglycerides and L.D.L. in patients, who were treated with A.C.E. inhibitors:-

Ages	40-45	46-50	51-55	56-60	61-65	66-70	Total
Decreased cholesterol*	2(14.28%)	0(0%)	3(21.43%)	5(35.71%)	2(14.28%)	2(14.28%)	14(60.86%)
Decreased triglycerides **	1(20%)	0(0%)	20%)(1	2(40%)	1(20%)	0(0%)	5(27.73%)
Decreased L.D.L.***	0(0%)	0(0%)	0(0%)	0(0%)	3(75%)	1(25%)	4(17.39%)
Total	3(13.04%)	0(0%)	4(17.39%)	7(30.43%)	6(26.08%)	3(13.04%)	23(8.185%)***

***Number of patients which decreased their serum cholesterol levels with A.C.E. inhibitors.**

**** Number of patients which decreased their serum triglycerides levels with A.C.E. inhibitors.**

***** Number of patients which decreased their serum L.D.L. levels with A.C.E. inhibitors.**

*****23(8.185) is out of the total 281 patients A.IIR.A.**

Table (No.3): distribution of cholesterol, triglycerides and L.D.L. in patients, who were treated with A.II R.A.:-

Ages	40-45	46-50	51-55	56-60	61-65	66-70	Total
Decreased cholesterol*	2(16.67%)	0(0.0%)	3(25%)	2(16.67%)	5(41.67%)	0(0.0%)	12(50%)
Decreased triglycerides **	1(20%)	0(0.0%)	1(20%)	2(40%)	1(20%)	0(0.0%)	5(20.83%)
Decreased L.D.L.***	0(0.0%)	0(0.0%)	0(0.0%)	3(42.85%)	3(42.85%)	1(14.28%)	7(29.16%)
Total	3(12.3%)	0(0.0%)	4(16.66)	7(29.16%)	9(37.50%)	1(4.16%)	24(8.540%)***

***Number of patients which decreased their serum cholesterol levels with A.IIR.A.. inhibitors.**

**** Number of patients which decreased their serum triglycerides levels A.IIR.A..**

***** Number of patients which decreased their serum L.D.L. levels with A.C.E. inhibitors A.IIR.A..**

*****24(8.540) is out of the total 281 patients A.IIR.A..**

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مقارنة بين مجموعة مثبطات أنزيم الأنجيوتينسين(ACE inhibitors) و مثبطات مستقبلات الأنجيوتينسين 2(Angiotensin II Receptors Antagonists) عند مرضى تضيق القصبات الهوائيه المزمن وارتفاع الضغط الدموي

أنجزت هذه الدراسة على (281) مريض والذين كانوا "مرضى تضيق القصبات الهوائيه المزمن" (C.O.P.D.s) وجميعهم كانوا يعانون من ارتفاع الضغط الدموي . وجميع هؤلاء المرضى خضعوا للفحوصات السريرية والمختبرية (خاصة فحص الدهون الذائبة في الدم واللزوجة الدموية), والفحوصات الشعاعية للصدر وقد بينت هذه الدراسة على استجابة هؤلاء المرضى والسيطرة على الضغط الدموي المرتفع عندهم, فقد أظهرت المجموعة التي عولجت بواسطة مثبطات أنزيم الأنجيوتينسين (A.C.E. inhibitors) تأثيرا أكبر من المجموعة التي عولجت بواسطة مثبطات مستقبلات الأنجيوتينسين 2(Angiotensin II Receptors Antagonists), في تخفيض الضغط الدموي في (175) مريض وبنسبة (62,27%) لمجموعة مثبطات أنزيم الأنجيوتينسين(A.C.E. inhibitors) , مما كانت عليه نسبة مجموعة عقار مثبطات مستقبلات الأنجيوتينسين 2(Angiotensin Receptors Antagonists) والتي أخفضت الضغط الدموي في (106) مريض وبنسبة (37,72%). وقيد بينت هذه الدراسة نسبة مقبولة في انخفاض نسبة الدهون الذائبة في الدم والتي كانت متساوية تقريبا لكلي مجموعتي ألعقارين حيث خفضت مجموعة مثبطات أنزيم الأنجيوتينسين(A.C.E. inhibitors) الدهون الذائبة في (23) مريض وبنسبة (8,185%), بينما انخفضت نسبة الدهون الذائبة في الدم في المجموعة التي عولجت بواسطة مثبطات مستقبلات الأنجيوتينسين2 (Antagonists Angiotensin II Receptors) في (24) مريض وبنسبة (8,540%). *ولم تظهر هذه الدراسة فرقا إحصائيا كبيرا عند المرضى الذين عولجوا بعقاقير مجموعة مثبطات أنزيم الأنجيوسين (A.C.E. inhibitors) ومجموعة عقاقير مثبطات مستقبلات الأنجيوتينسين(R.A A.II) في خفض نسبة الدهون الذائبة في الدم لدى هؤلاء المرضى.*