

(2001/11/6 2001/10/20)

(/ 100) (Atenolol)
 TG T-cho
 - HDL-C -
 VLDL-C - LDL-C
 - / (LDL-C) -
 - / (T-cho) (HDL-C)
 (152) .(HDL-C)
 (40) (/ /100) (Tenormin) (112)
 (40)
 . ()
 T-cho/HDL-C LDL-C / HDL-C)
 HDL-C (T-cho LDL-C VLDL-C TG
 TG T-cho/HDL-C LDL-C / HDL-C)
 HDL-C (T-cho LDL-C VLDL-C
 TG T-cho/HDL-C
 T-cho VLDL-C

Effect of Atenolol on the Level of Lipids in Hypertensive Patients

Mahdi S. Yassen

Intesar G. Taha

Department of Chemistry

College of Science

Mosul University

ABSTRACT

This clinical study was designed to evaluate the effect of Atenolol at a dose of (100 mg / day) on the level of serum lipids namely total cholesterol (T-cho), triglyceride (TG), high density lipoprotein – cholesterol (HDL-C), low density lipoprotein – cholesterol (LDL-C), very low density lipoprotein – cholesterol (VLDL-C) as well as the ratios of LDL-C/HDL-C and T-cho/HDL-C. (152) patients were diagnosed as having hypertension, (112) of them were treated with Atenolol (tenormin) (100mg/day), the remaining (40) patients have been hypertensives who have not been treated for hypertension and for the sake of comparison, samples have been taken from (40) normal individuals (the control group) of both sexes.

It was found that Atenolol increased the ratio of LDL-C/HDL-C, T-cho/HDL-C, TG, VLDL-C, LDL-C and T-cho while it decreased the level of HDL-C in blood serum of both sexes as compared with the non treated hypertensives. The results also demonstrated that hypertension caused an increase in the LDL-C/HDL-C and T-cho/HDL-C ratios, LDL-C, TG, VLDL-C and T-cho while it caused slight decrease in HDL-C in blood serum of both sexes as compared with control group.

Nevertheless, it was found that the increase in the ratio of T-cho/HDL-C and the levels of TG, VLDL-C and T-cho in blood serum of hypertensive females was slightly greater than that in their counter part males.

(Beta-blocker)

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Catecholamine

(Wilson et al., 1991 ; Duffy et al., 1991)

(Rang and Dale,1987) Hypertension

(Laurence et al., 1997)

Angina Pectoris

Unstable Anina

(Soma et al., 1989)

Myocardial Infarction

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(Mangano et al., 1996)

(Petro, 1997)

.(Mardikar et al., 1995)

(Duffy et al., 1991) Acute Myocardial Infarction

(4-2)

(Kirch et al., 1981) %(60-40)

.(Rubin et al., 1982)

%(10)

%(90)

(Edwards and Bouchier, 1991)

%(20)

(Goodman et al., 1992)

(Cruickshank and Prichard, 1987)

(Wadwarth et al., 1991) (6-3)

(Wall, 1979 ; Cove and Kirckc, 1983)

(Ress, 1979)

(Shaw and Gopalk, 1982)

(Weber, 1982) Diplopia

(Lewis and Cochrance, 1985)

Dyspnea

Artial Fibrillation

(Giorgi et al., 1988) Dizziness

(/ 100)

(112)

(33 79)

(40) .(6 -)

(/ 100)

(18 22)

(20 20)

(40)

(70-40)

()

Standard Kits

.T-cho TG HDL-C

Bio Merieux

Duncan

B

A

(P<0.05)

(1)

T-cho

.(Day et al., 1982)

(1988) Agele Krone

(1969) Freis

TG

(2)

.(Simons et al., 1992)

(Beta - blockers)

GT

.Lipase

(2)

.(Day et al., 1982)

TG

(1951) Wiliens

185.3 ± 15.8	DC 188.15±16.18	D 182.6 ±15.33	(100/) ±	
2.5	3.61	3.42		
40	20	20		
12.63±212.79	BA 216.86 ± 8.70	BC 208.72±15.82	(100/) ±	
1.99	1.85	3.73		
40	22	18		
218.04 ± 9.9	A 222.4±7.09	BA 213.69±13.5	(100/) ±	
0.93	0.79	2.35		
112	79	33		

(P < 0.05)

: 2

146.8±11.3	E 150.6±9.68	F 143.05 ±11.85	(100/) ±
1.78	2.16	2.65	
40	20	20	
177.2±14.5	C 182.68±10.2	D 171.72±3.32	(100/) ±
2.29	2.17	0.78	
40	22	18	
195.5±11.63	A ±11.24 202.12	B 189.81±6.7	(100/) ±
1.09	1.26	1.16	
112	79	33	

.(P < 0.05)

HDL-C

(3)

Simons

(1992)

Lecithin Cholesterol Acyl Transferase

HDL-C

(1988) Nagele Krone

HDL

HDL

Lipoprotein Lipase

()

.(1988)

Victor

HDL-C

.(1991)

Catalano

-

: 3

42.65 ±8.1	B 39.9 ±7.3	A 45.4 ±5.91	- (100/) ±	
1.28	1.63	1.32		
40	20	20		
38.86±3.31	B 36.22±3	A 41.50±3.83	- (100/) ±	
0.52	0.63	0.9		
40	22	18		
31.50±5.59	D 29.11±4.1	C 33.9±4.23	- (100/) ±	
0.52	0.46	0.73		
112	79	33		

.(P < 0.05)

(1993) LDL-C Dujovne (4)

LDL-C
(1988) Smith Wyngaarden
(5)

VLDL-C

LDL VLDL

(1988) Victor

- : 4

113.36±14.9	D 118.13±7.2	ED 108.59±19.35	- (100/) ±
2.36	1.62	4.32	
40	20	20	
138.51±11.2	B 144.11±7.6	C 132.92±14.8	- (100/) ±
1.77	1.62	3.49	
40	22	18	
147.44±9.29	A 153.05±7.6	B 141.83±12.5	- (100/) ±
0.87	0.85	2.17	
112	79	33	

(P < 0.05)

VLDL-C

(5)

.(1988) Smith Wyngaarden

-

: 5

29.36±2.3	E 30.12±1.9	F 28.61±2.45	-	(100/) ±
0.63	0.42	0.54		
40	20	20		
35.43±1.9	C 36.53±2.04	D 34.3±0.66	-	(100/) ±
0.3	0.43	0.15		
40	22	18		
39.1±2.33	A 40.24±2.26	B 37.96±1.35	-	(100/) ±
0.22	0.25	0.23		
112	79	33		

.(P < 0.05)

(6)

HDL-C/T-cho

T-Cho

(Tietz, 1987) HDL-C

(HDL-C/T-Cho)

HDL-C

T-Cho

- / : 6

4.36±0.76	C 4.71±0.56	D 4.02±0.76	- / (100/) ±	
0.12	0.12	0.17		
40	20	20		
5.5±6.62	B 5.98±0.24	C 5.02±0.59	- / (100/) ±	
0.09	0.05	0.13		
40	22	18		
6.96±0.7	A 7.63±0.52	B 6.30±0.6	- / (100/) ±	
0.06	0.05	0.1		
112	79	33		

.(P < 0.05)

(LDL-C/HDL-C) (7)

(Tietz, 1987) HDL-C

LDL-C

- / - : 7

2.67±0.68	C 2.96±0.47	D 2.39±0.67	/	-	(100/) ±
0.1	0.1	0.14			
40	20	20			
3.58±0.5	B 3.97±0.2	C 3.2±0.46	-	/	(100/) ±
0.07	0.04	0.1			
40	22	18			
5.1±0.66	A 5.25±0.43	B 4.18±0.47	-	/	(100/) ±
0.06	0.04	0.08			
112	79	33			

.(P < 0.05)

HDL-C/LDL-C

(Tietz, 1987) HDL-C

LDL-C

- Catalano, M., Aronica, A. and Carzaniga, G., 1991. Serum Lipids and Apolipoprotein in Patients with Essential Hypertension, *Ather-Osclerosis* 87,17, Cited by Simons, L.A., Meallum, J. and Friedlander, Y., 1992, *Atherosclerosis*. Vol. 92, pp.59-65.
- Cove, R. and Kircke, A., 1983. New Drugs: Beta-Blockers and Sympathomimetics. *Br. Med. J.* Vol. 286, pp.1650-1651.
- Cruickshank, J.M. and Prichard, B.N.C., 1987. *Beta-Blockers in Clinical Practice*. Churchill Livingstone, 253p.
- Day, J.L., Metcalf, E.J. and Simpson, C.N., 1982. Adrenergic Mechanisms in Control of Plasma Lipid. *Br. Med. J.* Vol. 284, pp.1145-1148.
- Duffy, M.A., Bartlett, R.B., Vernon, A.G., Schumacher, M.M. and Napoltano, L.V., 1992. *Physicians Desk Reference*. 45th ed." Published by: Edward R. Barnhart, pp.1075-1078.
- Dujovne, C.A., Eff, J., Ferraro, L., Goldstein, R.J., Gotto, A.M., Hall, W.D., Harris, W.S., Held, S.J. and Hunninghake, D.B., 1993. Comparative Effects of Atenolol Versus Celiprolol on Serum Lipids and Blood Pressure in Hyperlipidemic and Hyper-Tensive Subjects. *Am. J. Cardiol (Abstract)*, 72(15): pp.1131-1136.
- Edwards, C.R.W. and Bouchier, I.A.D., 1992. *Davidson's Principles and Practice of Medicine*. 16th. Ed., Churchill Livingstone, Medical Division of Longman Group, UK, Ltd., Edinburgh, 275p.
- Freis, E.D., 1969. Hypertension and Atherosclerosis. *Am. J. Med.* 45: pp.737-740.
- Giorgi, G., Legramante, J.M., Fioravanti, G. and Legramante, A., 1988. A Comparative Study of Doxazosin Versus Atenolol in Mild-to-Moderate Hypertension. *Am. Heart. J.* Vol. 116, pp.1801-1805.
- Goodman, A.G., Rall, T.W., Nies, A.S. and Taylor, P., (Eds.) 1992. *The Pharmacological Basis of Therapeutics*. 18th. Ed., New York, pp.229-237.
- Herfindal, E.T. and Hirschman, J.L., 1984. *Clinical Pharmacy and Therapeutics*. 3rd. ed., Williams and Wilkins, London, pp.803-806.
- Kirch, W., Kohler, H., Spahn, H. and Mutschler, E., 1981. Interaction of Cimetidine with Metoprolol, Propranolol or Atenolol. *Lancet*. Vol. 2, pp.531-532.
- Krone, W. and Nagele, H., 1988. Effects of Antihypertensives on Plasma Lipids and Lipoprotein Metabolism. *Am. Heart. J.* Vol. 116, pp.1729-1734.
- Laurence, D.R., Bennett, P.N. and Brown, M.J., 1997. *Clinical Pharmacology*. 18th. Ed. Churchill Livingstone.
- Lewis, L.D. and Cochran, G.M., 1985. Beta-Blocker May Precipitate Latent Asthma. *Practitioner* Vol. 229: pp.6633-665. Cited by Cruickshank J.M. and Prichard, P.N.C., 1987. *Beta-blockers in clinical practice*.

- Mangano, D.T., Layng, E.L., Wallace, A. and Tateo, I., 1996. Effect of Atenolol on Mortality and Cardiovascular Morbidity after non Cardiac Surgery. *New Engl. J. Med.* Vol. 335, No. 23, pp.1713-1721.
- Mardikar H.M., Sahasrabhojaney, V.S., Jalgaonkar, U.M., Mahorkar, M.H. and Waghmare, B.G., 1995. Long Term Effects of Atenolol in Patients of Mitral Stenosis and Normal Sinus. *Indian J. Med. Res.* Vol. 101, pp.25-27.
- Petro, I., 1997. Effect of Atenolol Mortality and Cardio Vascular Morbidity after non Cardia Surger. *New Engl. J. Med.* Vol. 336, No. 20, 1452p.
- Rang, H.P. and Dale, M.M., 1987. *Pharmacology.* Churchill Livingstone, 198p.
- Ress, P.J., 1979. Peripheral Skin Necrosis Complicating Beta-Blockade. *Br. Med. J. I.* 995p.
- Rubin, P.C., Scott, J.W., Mclean, K., Pearson, A., Ross, B. and Reid, J.L., 1982. Atenolol Disposition in Young and Eldery Subject. *K. Br. J. Clin. Pharmacol.* Vol. 3, pp.235-237.
- Shaw, A.B. and Gopalk, S.K., 1982. Renal Artery Thrombosis Caused by Antihypertensive Treatments. *Br. Med. J.* Vol. 285, 1617p.
- Simons, L.A., Mcallum, J. and Friedlander, Y., 1992. Dubbo Study of the Elderly: Hypertension and Combination of Blocker and Anti-Arrhythmic Therapy. *J. Inter. Med. Res.*, Vol. 17, pp.113-124.
- Tietz, N.W., 1987. *Fundamental of Clinical Chemistry.* 3rd., ed. W.B. Saunders Company, pp.496-478.
- Victor, J., Dzau, M.D. and Mass, B., 1988. Mechanism of the Interaction of Hypertension and Hypercholesterolemia in Atherogenesis: the Effects of Antihypertensive Agents. *Am. Heart. J.* Vol. 116, pp.1725-1729.
- Wadwarth, A.N., Murdoch, D. and Brogden, R.N., 1991. Atenolol A Reappraisal of Its Pharmacological Properties and Therapeutic Use in Cardiovascular Disorders. *Drugs. Abstract.* Vol. 42, No. 3, pp.468-510.
- Wall, H.J., 1979. Atenolol and Three No9n Selective Hypertension. *Clin. Pharma. Ther.* Vol. 25, No. 1, pp.8-19.
- Weber, J.P. 1982. Beta-Adrenoreceptor Antagonists and Diplopia. *Lancet.* Vol. 2, pp.826-827.
- Wiliens, S.L, 1951. The Experimental Production of Lipid Deposition in Excised Arteries. *Sciece.* Vol. 114, 389p, Cited by Freis, Ed. (1969), *Am. J. Med.*
- Wilson, J.D., Braunwald, E., Lsselbacher, K.J., Petersdor, F.R.G., Martin, J.B., Fanci, A.S. and Root, R.K., 1991. *Harrison's Principles of Interinal Medicine.* 12th. Ed., Vol.2. McGraw-Hill, Inc. Health Proffession.
- Wyngaarden, J.B. and Smith, L.H., 1988. *Ceciltextbook of Medicine.* 18th ed., Vol. 1. W.B. Saunders Company, pp.1140-1143.