

Study of Dyslipidemia in Iraqi Hypertension Patients in Tikrit City

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Abstract

Background: Hypertension is prevalent all over the world and represent a major health problem. Dyslipidemia is a major cause of cardiovascular morbidity and mortality. There is a correlation between hyperlipidemia and hypertension.

Aim of study: to find out the prevalence of dyslipidemia in Iraqi hypertension patients, and to find out how many of them on statin therapy, and how many reach target according to the last guidelines

Patients and methods: a cross-sectional study conducted in outpatient clinic in Salahaddin General Hospital in Tikrit City. About 344 hypertensive patients were included in this study. A questionnaires including general information about patients were filled and venous blood was drawn from every patient and sent for hospital lab to measure necessary investigations. ASCVD risk score was calculated for every patient by ASCVD Risk Estimator Plus. Then data were analyzed by application of Microsoft excel program and Statistical Package for Social Sciences (SPSS) version 23.

Results: (49%) of hypertension patients had total cholesterol of >200 mg/dl, (63.4%) had LDL of ≥ 115 mg/dl, (57.6%) had HDL of <40 mg/dl, and (54.1%) had triglycerides of ≥ 150 mg/dl. Smoker patients in this study had highest ASCVD risk score ($12.65 \pm 6.63\%$) followed by former smokers ($7.36 \pm 3.56\%$) and non-smokers ($6.02 \pm 4.16\%$). Only 76 (22.1%) of hypertension patients were on statin therapy for hyperlipidemia and only 18 (23.7%) of them reaching target LDL level according to 2016 ESC/EAS guidelines. While 268 (77.9%) of hypertension patients had no statin therapy and only 65 (24.3%) of them had LDL level within target.

Conclusion: Hyperlipidemia is very prevalent in hypertension patients in Tikrit City, despite that only one of five receiving treatment and only one of four from those who received treatment reaching the target of LDL level according to 2016 ESC/EAS guidelines, and three of four of those who are on no treatment are out of the target. This is a major health problem need attention.

Keywords: Hypertension, Dyslipidemia, Cholesterol, HDL, LDL, Triglycerides

Introduction

Hypertension can be defined as an abnormally high arterial blood pressure. It is still accepted that

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hypertension defined as systolic blood pressure ≥ 140 mm Hg and/or diastolic blood pressure ≥ 90 mm Hg [1-3]. Because of its prevalence, hypertension represent a major health problem [4-7]. Hypertension affect about 32.6% of US population above 20 years of age [8]. In Iraq , about 35.6% of population above 18 years of age have hypertension [9]. Worldwide, dyslipidemia is a major cause of cardiovascular morbidity and mortality [10, 11]. Atherosclerosis is a progressive pathological process that lead to heart and cerebrovascular diseases [12,13] an dyslipidemia is a major risk factor of atherosclerosis.

About 39.6% of Iraqi population above 18 years of age have raised cholesterol or currently on statin treatment^[9]. There is a correlation between hyperlipidemia , hypertension and pulse pressure ^[14].

The aim of this study: to find out the prevalence of dyslipidemia in Iraqi hypertension patients, and to find out how many of them on statin therapy, and how many reach target according to the last guidelines.

Patients and method

This is a cross-sectional study conducted in outpatient clinic in Salahaddin General Hospital in Tikrit City, from 1st of January 2019 to 31st of May 2019. All established hypertension patients above 25 years of age that agreed to participate in this study were included.

Exclusion criteria: Patients with: established coronary or valvular heart disease, chronic kidney disease, diabetes mellitus , stroke or peripheral vascular disease were excluded.

About 344 hypertensive patients were included in this study after an oral informed consent taken from every patient . 156 (45.3%) of them were males, and 188 (54.7%) were females. Age range from (30-80) years with mean age of (50.34±10.35) years. Every patient was reviewed individually by a questionnaire including general information about patients beside smoking state and history of : cardiovascular disease, diabetes mellitus, chronic kidney disease or peripheral vascular disease, and history of treatment of dyslipidemia. Weight (Wt) and height (Ht) of every patient was recorded and body mass index (BMI) was calculated. Systolic and diastolic blood pressure of each patient was also recorded. Then 5 ml of venous blood was drawn from every fasting (for 14 hours) patient in this study and sent directly to hospital lab for measuring : fasting blood sugar, blood urea and serum creatinine to exclude diabetic patients and patients with Chronic kidney disease. Lipid profile including: serum total cholesterol, low density

lipoprotein (LDL), high density lipoprotein (HDL), very low density lipoprotein (vLDL) and serum triglycerides were also measured.

Then atherosclerosis cardiovascular disease (ASCVD) risk was calculated for every patient by ASCVD Risk Estimator Plus , an application provided by American College of Cardiology (ACC). Then patients were grouped into 4 groups: 1- low risk with ASCVD risk score of <1%, 2- moderate risk with ASCVD risk score of ≥1% and <5%, 3- high risk with ASCVD risk score of ≥5% and <10% and 4- very high risk with ASCVD risk score of ≥ 10% according to European Society of Cardiology (ESC) and European Atherosclerosis Society (EAS) 2016 guidelines for the management of dyslipidaemias ^[15].

Then data were analyzed by application of Microsoft excel program and Statistical Package for Social Sciences (SPSS) version 23. Outcomes of analysis were arranged into tables and figure. P-value was calculated by different probability tests.

Results

About 344 hypertensive patients were included in this study. 156 (45.3%) of them were males, and 188 (54.7%) were females. Age range from (30-80) years with mean age of (50.34±10.35) years. FB. sugar mean ± SD was (93.00±0.00 mg/dl) , B. urea mean ± SD was (33.79±6.82 mg/dl) ,and S. creatinine mean ± SD was (0.83±0.15 mg/dl).

About 171 patients (49%) had total cholesterol of >200 mg/dl (42.1% males and 57.9 females, and 218 of patients (63.4%) had LDL of ≥115 mg/dl (43.1% males and 56.9% females, and 198 of patients (57.6%) had HDL of <40 mg/dl (57.1% males and 42.9% females), and only 158 of patients (45.9%) had serum triglycerides of <150 mg/dl (38% males and 62% females. There was statistically significant increment of HDL and triglycerides in females as shown in table (1).

Table(1) Frequency of dyslipidemia according to gender distribution in Hypertension patients.

Variables	Subvariables	Male		Female		Total		P-value
		No.	%	No.	%	No.	%	
Total Cholesterol	>200 mg/dl	72	42.1	99	57.9	171	49.7	0.230
	≤200 mg/dl	84	48.6	89	51.4	173	50.3	
LDL	≥115 mg/dl	94	43.1	124	56.9	218	63.4	*0.621
	<115-100 mg/dl	32	51.6	30	48.4	62	18.0	
	<100-70 mg/dl	25	45.5	30	54.5	55	16.0	
	<70 mg/dl	5	55.6	4	44.4	9	2.6	

Cont... Table(1) Frequency of dyslipidemia according to gender distribution in Hypertension patients.

HDL	≥40 mg/dl	43	29.5	103	70.5	146	42.4	<0.0001
	<40 mg/dl	113	57.1	85	42.9	198	57.6	
Triglycerides	< 150 mg/dl	60	38.0	98	62.0	158	45.9	0.039
	150-199 mg/dl	48	52.7	43	47.3	91	26.5	
	≥ 200 mg/dl	48	50.5	47	49.5	95	27.6	

By Fisher Exact test.*

Patients with BMI of ≥ 30 Kg/m² had higher total cholesterol (212.38±54.84) mg/dl and HDL level (38.25±11.86) mg/dl, while patients with BMI of 25-29.9 Kg/m² had higher level of triglycerides (190.44±128.34) mg/dl and patients with BMI of 18.5-24.9 Kg/m² had higher level of LDL (144.71±44.84) mg/dl as shown in table(2). The differences were statistically not significant.

Table(2) Lipid profiles (mean ±SD) among hypertension patients according to BMI.

Variables	18.5-24.9 Kg/m ²	25-29.9 Kg/m ²	30≤ Kg/m ²	P. value
Total cholesterol (mg/dl)	210±46.21	200.37±41.57	212.38±54.84	0.132
HDL (mg/dl)	36.86±7.65	37.63±8.08	38.25±11.86	0.174
LDL (mg/dl)	144.71±44.84	127.46±33.03	134.06±41.22	0.815
Triglycerides (mg/dl)	123.71±32.34	190.44±128.34	179.88±114.87	0.133

Smoker patients in this study had highest ASCVD risk score (12.65±6.63%) followed by former smokers (7.36±3.56%) and non-smokers (6.02±4.16%) respectively as shown in table (3). The difference was statistically significant.

Table(3) ASCVD-score (Mean ±SD) among hypertension patients according to smoking status.

Variable	Smokers	Former	Non-smoker	P-value
ASCVD score (%)	12.65±6.63	7.36±3.56	6.02±4.16	<0.0001

In the present study there were 107 (31.1%) patients with hypertension had very high risk for developing ASCVD, most of them were males (65%), while 128 (37.2%) patients had moderate risk for developing ASCVD, most of them were females (71.9%) as shown in table (4). The difference was statistically significant.

Table (4) ASCVD risk according to 2016 ESC/EAS guidelines and gender distribution in hypertension patients.

Variables	Male		Female		Total		P-value
	No.	%	No.	%	No.	%	
Low risk	7	63.6	4	36.4	11	3.2	<0.0001
Moderate risk	36	28.1	92	71.9	128	37.2	
High risk	48	49.0	50	51.0	98	28.5	
Very high risk	65	60.7	42	39.3	107	31.1	

Only 76 (22.1%) of hypertension patients were on statin therapy for hyperlipidemia and only 18 (23.7%) of them reaching target LDL level according to 2016 ESC/EAS guidelines. While 268 (77.9%) of hypertension patients had no statin therapy and only 65 (24.3%) of

them had LDL level within target as shown in figure (1). The difference between treated and non- treated patients in reaching targeted LDL level was statistically not significant.

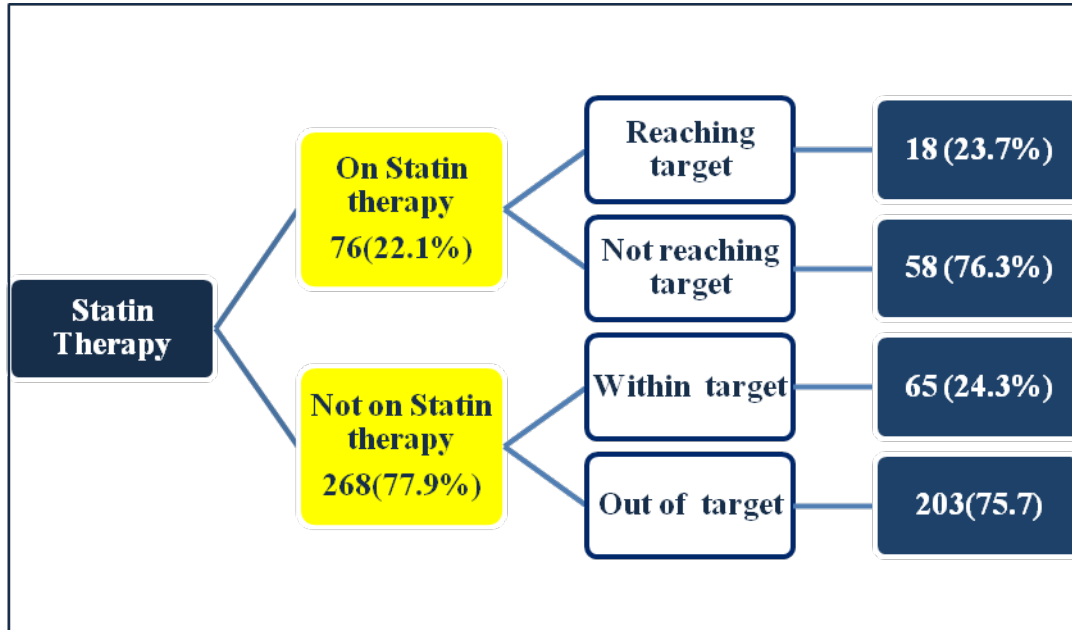


Figure (1) Flow-chart of hypertension patients according to using statin and reaching target of LDL level according to 2016 ESC/EAS guidelines.

Discussion

In the present study, females had levels of HDL and triglycerides significantly higher than that in males , while there was no significant difference in regard to levels of total cholesterol and LDL. Previous study [16,17] reported that sex -related differences in triglycerides, total cholesterol , HDL and LDL levels, other study [18] found no sex -related differences in TC and LDL in subjects aged 50 years and more but females had lower level of triglycerides and HDL than males. In another study [19] females aged 18 years and more had lower levels of triglycerides and LDL and higher level of HDL than males.

In the present study there was no significant differences in levels of total cholesterol, triglycerides, LDL and HDL among different BMI groups. Associations of adiposity at baseline and dyslipidemia have been shown in large prospective studies[20-24], however there is inverse relationship between smoking and body weight [25], and smoking associated with low HDL [26], for this reason and perhaps using of statin therapy by some patients in this study may lead to these

results.

The present study revealed the effect of smoking on raising ASCVD risk and this is in agreement with other studies [27-30]. Also this study revealed that most of very high risk group for developing cardiovascular disease were men and this is in agreement of other studies [20-24].

The present study revealed that only 22.1% of Iraqi hypertension patients in Tikrit City on statin therapy and only 23.7% of them reaching target of LDL level , while 77.9% of them are not on any treatment for hyperlipidemia, although 75.7% of them are out of target of LDL level according to 2016 ESC/EAS guidelines. This is comparable to a study done in Russia [31].

Conclusion

Hyperlipidemia is very prevalent in hypertension patients in Tikrit City, despite that only one of five receiving treatment and only one of four from those who received treatment reaching the target of LDL level according to 2016 ESC/EAS guidelines, and three of four of those who are on no treatment are out of the target. This is a major health problem need attention.

❖ **Conflict of Interest** - (nil – There are “NO CONFLICT OF INTEREST”).

❖ **Source of Funding** - By all researchers (**self**).

❖ **Ethical Clearance:** Committee members are approved to perform a study about

“Study of dyslipidemia in Iraqi Hypertension patients in Tikrit city”

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