Research Paper

Medical Science

A Study of Lipid Profile and Glycosylated Haemoglobin in Hypertensive

* Dr Mohd Aslam ** Dr Md. Anisur Rahman *** Prof. Shadab A Khan **** Prof. Sangeeta Singhal

* Associate Professor, Deptt of Physiology, J N Medical College, AMU, Aligarh, UP

** Assistant Professor, Deptt of Physiology, Rohilkhand Medical College, Bareilly, UP

*** Deptt of Medicine, J N Medical College, AMU, Aligarh, UP

**** J N Medical College, AMU, Aligarh, UP

ABSTRACT

Essential hypertension is a complex multifaceted disorder, which may include other abnormalities including dyslipidemia, central obesity, glucose intolerance and hyperinsulinemia. All these may increase the risk of coronary heart disease, stroke and other vascular complications. Worldwide raised blood pressure is estimated to cause 7.5 million deaths, about 12.5 per cent of all annual deaths. A case-control study was carried out on patients attending the General Medicine OPD of J N Medical College, Aligarh. The study was done to assess the levels of lipid profile and glycosylated haemoglobin in hypertensive subjects. We included forty non-diabetic and hypertensive subjects as cases and forty non-diabetic and non-hypertensives as controls. Cardio-vascular parameters, lipid profile, blood sugar and glycosylated haemoglobin were measured for all the subjects. We found a significant decrease in HDL (p<0.01), Significant increase in TC/HDL Ratio (p<0.01) And increase Glycosylated Hb (p< 0.01) in non-diabetic hypertensive subjects as compared to non-diabetic, normotensive controls. No significant difference was found in total cholesterol, LDL, VLDL, triglycerides and blood sugar level of cases and controls in our study. The low HDL levels and abnormal TC/HDL ratio should be taken into account while assessing the future risk of coronary heart disease as well as drug therapy of hypertension. The estimation of glycosylated haemoglobin can be beneficial to assess the severity and complications of hypertension and its' prevention.

Keywords : Hypertension, Lipid profile, Glycosylated Hb

Introduction:

Hypertension is silent killer with no warning symptoms and global public health problem. It contributes to the burden of heart diseases, stroke, kidney failure, premature death and disability.[1]Globally cardiovascular disease accounts for approximately seventeen million deaths in a year, nearly one third of the total[2]. Of these complications hypertension accounts for 9.4 million deaths world wide[3]. 40 per cent of the adults aged 25 and over had raised blood pressure in 2008[4]. 80 per cent of non-communicable disease deaths occur in low and middle income countries.[4] Hypertension is defined as a systolic BP equal to or above 140 mm Hg and or diastolic BP equal to or above 90 mm Hg[5]

Essential hypertension is a complex multifaceted disorder, which may include other abnormalities including dyslipidemia, central obesity, glucose intolerance and hyperinsulinemia[6] Few studies in western population have established the relation between hyperlipidemia and hypertension[7]. Accumulating evidencs indicate that protein glycation play a vital role in the pathogenesis of cardiovascular disease.[8] Cardiovascular risk factor significantly increased as the HbA1c increased.[9]

Hypertension is both preventable and treatable and is theme for World health Day 2013.[10]Early detection and management of high blood pressure can help in reducing the risk of heart attack, heart failure, stroke and kidney failure[11]. Keeping in mind this study was carried out in Medicine OPD of JNMC with the aims and objectives to assess the levels of lipid profile and glycosylated haemoglobin in hypertensive subjects and compare it with normotensive subjects.

Material and Methods:

This was a case-control study was carried out on patients attending the General Medicine OPD of J N Medical College, Aligarh. Forty hypertensive subjects were included as cases and forty non-hypertensives as controls. Subjects having diabetes, renal impairment, hepatic dysfunction and target organ damage were excluded from the study. Cardio-vascular parameters, lipid profile, blood sugar and glycosylated haemoglobin, liver function test, renal function test, urine examination, Chest X-Ray & ECG were done for all the subjects. Intracubital venous blood was collected from subjects. Glucose estimation was done by Glucose Oxidase Peroxidase method. Glycosylated haemoglobin was estimated by a kit supplied by Coral clinical system (CREST BIOSYSTEM). The kit uses the Ion Exchange Resin Method. Estimation of Triglycerides was done by G.P.O.P.A.P. method & Total Cholesterol was done by Wybenega and Pollegi method. Data was analysed using SPSS 17.0 for windows. Statistical analysis was done by using Mean, Standard Deviation (S.D) and Unpaired T-Test for p value.

Result:

Table I: Mean Lipid Level in Hypertensives vs Controls

S.N.	LIPIDS	Hypertensives (Mean+/-SD)	Controls (Mean+/-SD)	p-value
1	Total Cholesterol (mg%)	188.81+/-10.97	184.52+/-12.27	p>0.05
2	HDL (mg%)	37.25+/-2.95	41.36+/-3.21	P<0.05*
3	LDL (mg%)	115.72+/-11.08	111.66+/-12.82	p>0.05

4	VLDL (mg%)	35.86+/-5.28	34.287+/-5.68	p>0.05
5	Triglycerides (mg%)	178.23+/-32.83	174.4+/-26.03	p>0.05
6	TC/HDL	5.1078+/0.577	4.4967+/-0.5607	P<0.05*

Table I reveals that there is a significant difference between HDL level and TC/HDL ratio between cases and control.

Table II: Mean Blood Sugar & HbA1C levels in hypertensives vs. Control

S.N.	Characteristics	Hypertensives (Mean+/-SD)	Controls (Mean+/-SD)	p-value
1	Blood Sugar (mg%)	111.86+/-10.24	109.47+/-7.4	p>0.05
2	HbA1C (%)	6.83+/-0.648	5.86+/-0.579	P<0.05*

As per Table II although there is no significant difference in the level of blood sugar of cases and controls, a significant difference in the level of glycosylated haemoglobin of cases and control was seen.

Discussion:

In our study we found a significant difference in HDL cholesterol and TC/HDL among hypertensives and non hypertensives. A study[12] by Thakur et al has similar findings regarding total cholesterol and HDL as our study. A few studies in Western populations have established the relationship between hyperlipidemia and hypertension[6,13,14]. Since many studies have established the anti atherogenic and a vascular protective effect of HDL cholesterol, this study has also made an attempt to understand the role of HDL levels in hypertension.Exercise is shown to increase HDL and decrease triglycerides[15] which in turn reduces the risk of coronary heart diseases. Although no significant difference was observed in blood sugar levels, a statistically significant difference was found in glycosylated haemoglobin of hypertensives and non hypertensives. Some other studies reported similar findings[16]. Detrmination of HbA1c in diabetic patients is the most reliable indicator for assessment of retrospective glycemic control and planning of clinical management[17]. It has been reported that HbA1c and lipid peroxides are significantly associated with each other[18]. Lipid peroxides in vitro have been found to enhance the glycation of proteins[19]. Glycation and lipid peroxides are said to be two important processes known to play a key role in complications of many pathophysiological processes. Recent studies have uncovered a myriad of pathological events induced by albumin[20,21] leading to atherosclerosis.

Conclusion and Recommendation:

High blood pressure has been associated with elevated atherogenic blood lipid fractions and glycosylated haemoglobin out of which HDL cholesterol levels play a significant role. So it is suggested that medical treatment (antihypertensives, lipid modifying agents) along with life style modification (exercise and dietary changes) are vitally important for control and prevention of hypertension and its' complications. Estimation of HbA1c can be beneficial to assess the severity and complications of hypertension.

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