

Prevalence of Prediabetes in Hypertension in Young Population

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ABSTRACT

Aim: To assess the prevalence and correlation of prediabetes in hypertension cases in young population in age group 18 to 35 years.

Place & date: The study is conducted in young outpatient door cases in Pak Red Crescent Medical and Dental college in department of medicine OPD cases Dina Nath in the period wef January 2020 to September 2020.

Methods: Finding Central Obesity and fasting blood sugar in essential hypertension cases without DM

Results: In Sixty Male And Female essential hypertension cases high fasting blood sugar more than 100 mg was noted in 35% cases. Only .however obesity was noted in 55 % cases.

Conclusions: The results of prediabetes in hypertension were computed in patients with hypertension only 35 % cases were prediabetic .it was concluded that prediabetes is not the etiological factor in hypertension and some other factors such as obesity or renal factor or dyslipidemia may be responsible for hypertension .

INTRODUCTION

This study is for finding the prevalence and correlation of prediabetes in hypertension cases in young rural population as each of which is a major risk factor for atherosclerosis^{1,2}. Prediabetes is a condition which is present as IFG and/or IGT³ and creates a toxic environment for development of cardiovascular disease⁴. Prediabetes if not treated properly may progress to full blown diabetes mellitus^{5,6}, which may lead to serious micro vascular and macro vascular complications^{7,8}. Several studies reported that higher levels of cytokines as CRP, tumor necrosis factors and IL6 in visceral obesity while IL6 in particular lead to insulin resistance which lead to higher risk for progression from normoglycemia to prediabetes². While adipopect in another favorable cardiomegaly and anti-inflammatory effect reduces the risk in case of subcutaneous fats deposits, so increase in visceral fat deposits increase the incidence of insulin resistance by 80 percent⁹ while increase in subcutaneous adipose tissue mass decreases odds of insulin resistance 40%¹⁰.

So insulin resistance is the major factor in etiology of prediabetics. Also finding the prevalence of prediabetes in association with hypertension increase risk of cardiovascular disease^{11,12}. Although there is hyperinsulinemia due to insulin resistance but it is also postulated that insulin decreases peripheral resistance and may not cause hypertension. Now several studies are confirming that hypertension in case of insulin resistance is not due to hyper insulinemia but due to its effect on kidney proximal tubules which absorb more salt and so cause hypertension which are not affected by hyperinsulinemia in insulin receptors as only insulin receptors in adipocytes and skeletal muscles are affected by hyperinsulinemia due to insulin resistance in diabetes and hence in prediabetes^{13,14}.

MATERIALS AND METHODS

The patients age sex weight were taken and on history and

Received on 03-10-2020

Accepted on 12-12-2020

examination not suffering from diabetes mellitus and not pointing to any known cause of secondary hypertension were selected from young patients in age group of 18-35 years with minor ailments suffering from hypertension as per JNC 8 criteria and who were non-alcoholic and non-smokers as per jnc 8 were selected for study purposes¹⁵. Also the patients were investigated on physical examination and further investigation were not suffering from any complications of hypertension.

Detection of hypertension: The patients' blood pressure were measured with standard mercury japan made sphygmomanometers on both arms and the one with lower blood pressure reading was taken when the patient was seated for at least 5 minutes before blood pressure recording. Also the patient was sitting with back support and blood pressure recorded at heart level sitting position in calm atmosphere. At least 2 measurements were recorded and mean of measurements recorded. The patients BMI were taken. Thyroid examination performed. Also general physical examination performed. A systemic review on examination, abdominal examination with emphasis on listening to bruit to rule out renal artery stenosis was performed. The patients fasting blood sugar and 2 hours postprandial blood sugar was performed. Also renal function tests, urinalysis were performed.

RESULTS

The results of prediabetes in hypertension were computed in the following tables.

Table 1: Demographic data: the patients mean age (18 to 40 years) sex body weight

Name of data	Male	Females	total	Prevalence
Sex	35	25	60	
Weight central abdominal girth >102cm in males .>88cm in females	1851%	1560%	33	55%
Normal weight. No central obesity .	1749%	10(40%)	27	45%

It is seen nearly equal number of males and females in the study were obese 55% and non-obese 45%.

Table 2: Patients with hypertension and central obesity

Sex	Number	Obese	Non obese
Male	35	18	17
Female	25	15	10
Total	60	33	27

18/35 males and 15/25 females were centrally obese i.e. the total 33/60 males were centrally obese while 17/35 males and 10/25 females total 27/60 were non obese.

Table 3: Fasting blood sugar in Hypertension Patients

	Male(n=35)	Female(n=25)	n	Prevalence
FBS>100mg/dl	12(34%)	9(36%)	21	35%
FBS<100mg/dl	23(66%)	16(64%)	39	65%

So it is apparent 12/35 males and 9/25 females (total 21/60) suffering from hypertension were found as prediabetic and 23/35 males and 16/25 females (total 39/60) were having normal fasting blood sugar and 10/25 females (total 27/60) were non obese but hypertensive

Table 4: Pts with hypertension high blood sugar & central obesity

Sex (no)	High fbs	Low fbs	Central obese	Non central obese
Male 35	12	23	18	17
Female 25	9	16	15	10

So it is apparent 12/35 males and 9/25 females (total 21/60) suffering from hypertension were found as prediabetic and 23/35 males and 16/25 females (total 39/60) were having normal fasting blood sugar as against 18/35 males and 15/25 females were centrally obese i.e. the total 33/60 males were centrally obese while 17/35 males and 10/25 females (total 27/60) were non obese but hypertensive.

DISCUSSION

In the present study prediabetes is diagnosed in a very small number of cases of hypertension in young age group, it may be due to the fact that as has been described that hypertension is not the manifestation of diabetes or prediabetes as both are insulin resistance states and insulin has no effect on kidney in sodium absorption in this condition. Many studies in national & international levels found correlation of hypertriglyceridemia & low HDL C levels with hypertension in non-obese & non diabetic patients in young and old population in high proportion of cases which may also be explained due to vasoconstriction effects of dyslipidemia on endothelium^{16,17} in Pakistan in a study on forty patients in rural population of hypertension cases hyperglycemia was found in 11/14 with metabolic syndrome¹⁸, while in other 24 cases only 3/24 were found prediabetic without any other factor of metabolic syndrome¹⁹. So prediabetes & dyslipidemia may be in some cases may be individually & in some cases combinedly may be associated with hypertension even in non-obese & non diabetic patients or full blown picture of metabolic syndrome.

CONCLUSIONS

The results of prediabetes in young hypertension patients with show that 35% cases were prediabetic. It was concluded that prediabetes is not the only etiological factor in at least young population. It may also be concluded that although the patients in prediabetes may have insulin resistance as many patients are obese in the study but not hypoglycemic and some other factors such as salt intake or

renal factor or dyslipidemia may be responsible for hypertension. So further studies may be planned to find the other factors responsible for hypertension in young population

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