SCREENING FOR RISK FACTORS FOR CHRONIC KIDNEY DISEASE IN TYPE 2 DIABETIC PATIENTS IN UNIVERSITY OF BENIN TEACHING HOSPITAL.

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INTRODUCTION

- **Incidence of diabetes mellitus is increasing worldwide and 20-30% of diabetics develop diabetic nephropathy (DN).**

- **DN is the leading cause of end stage renal disease in US and Europe. Prevalence of DN is on the increase in Nigeria and ranks 3rd amongst causes of chronic renal failure in Nigeria.**
- **Poor control of blood glucose, blood pressure, dyslipidaemia , obesity, metabolic syndrome are some of the risk factors for CKD in diabetics.**

- **Early identification and modification of risk factors for CKD should form part of the preventive strategies in the management of diabetic patients.**

OBJECTIVES

- **To determine the prevalence of some risk factors for CKD in type 2 diabetic patients attending UBTH.**

METHODOLOGY

- A descriptive cross sectional study involving 144 (53 males and 91 females) type 2 diabetic patients who were recruited from outpatient clinic after meeting the inclusion criteria and giving informed consent.
- Study period was 6 weeks
- Inclusion Criteria: Type 2 diabetics, compliance to clinic attendance, consenting individuals.
- Exclusion Criteria: Type1 diabetics, non-compliance to clinic attendance, non-consenting individuals.

- Socio-demographic data , duration of diabetes and hypertension were obtained. Weight in kg, height in cm, hip circumference in cm, waist circumference in cm were measured and BMI(kg/m^2) was calculated
- FBS and BP of the last 2 clinic visits and index clinic visits were recorded and average of these values were calculated.
- The fasting serum lipid profile results were recorded.

DEFINITION OF VALUES

- Poor glycaemic control was defined as FBS > 110mg/dl
- Poor blood pressure control was defined as SBP >130 mmHg and or DBP > 80 mmHg
- Dyslipidaemia was defined as any or combination of the following: TC > 200mg/dl, LDL-C> 100mg/dl, HDL-C < 40mg/dl in males, < 50mg/dl in females, TG> 150mg/dl.
- Metabolic syndrome was defined using the NCEP-ATP III 2001 criteria. Any 3 of the following were taken as metabolic syndrome:

  FBS> 10Omg/dl or diabetic on treatment

  BP> 130/85mmHg or hypertensive on treatment

  WC>102 cm in males and > 88cm in females

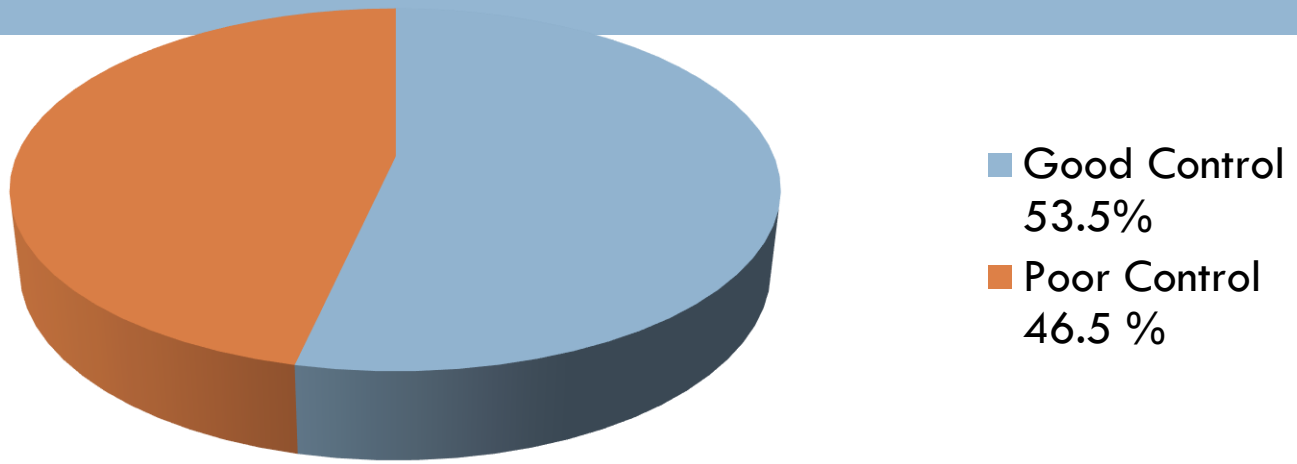
  TC > 150mg/dl, HDL-C <40mg/dl in males and <50mg/dl in females
- Using the BMI values(kg/m2): underweight was defined as < 18.5, normal weight as 18.5-24.9, overweight as 25-29.9 and obese as > 29.9
- Data were analyzed using SPSS version 16.

RESULTS AND DISCUSSION

Characteristics of Study population

	Mean	Std deviation
Age (years)	57.49	11.49
Hip circumference (cm)	103.40	12.82
Waist circumference (cm)	99.22	12.44
Total Cholesterol (mg/dl)	177.94	45.52
HDL C (mg/dl)	52.60	18.58
TG (mg/dl)	111.94	42.59
LDLC (mg/dl)	104.22	38.28
BMI (kg/m^2)	28.322	5.03
FBS (mg/dl)	136.55	46.55
BP Systolic (mmHg)	132.76	15.73
BP Diastolic (mmHg)	79.32	8.91
Duration since Diagnosis (DM) (years)	6.02	6.21
Duration since Diagnosis (HTN) (years)	7.19	6.91

GLYCAEMIC CONTROL

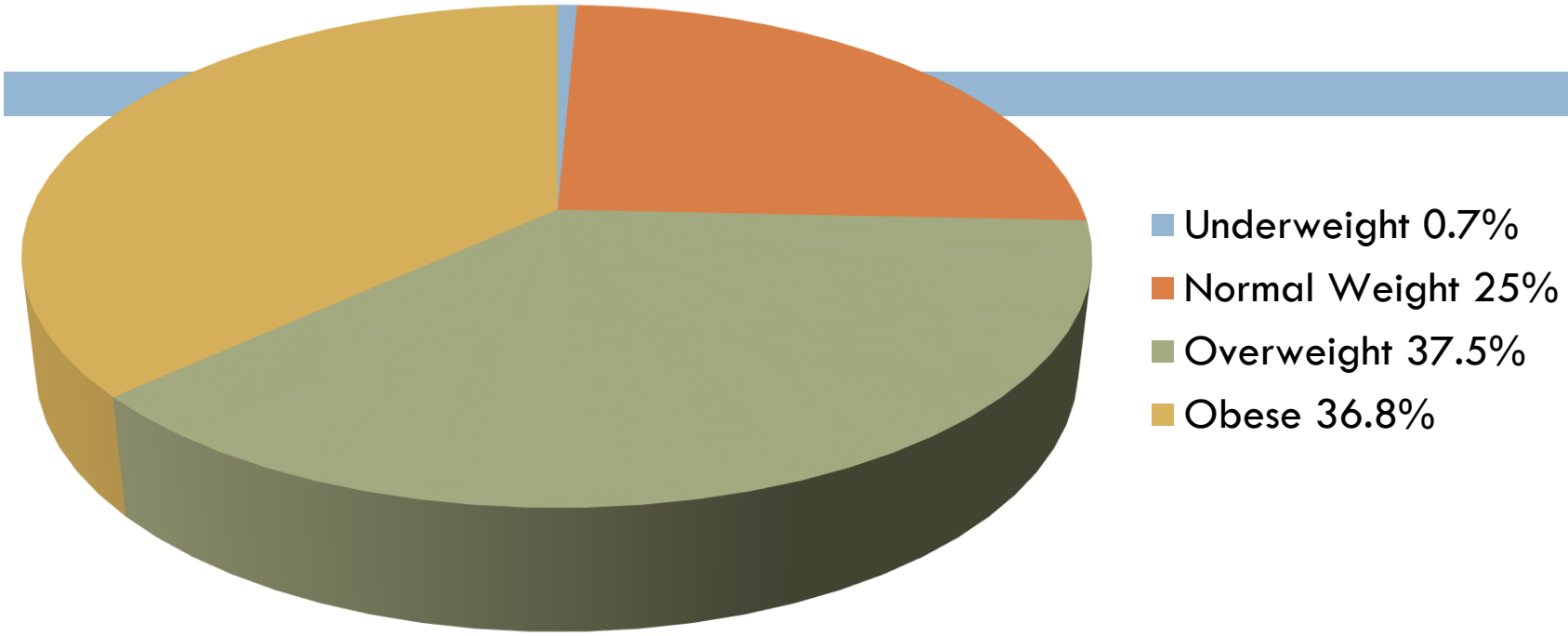


Studies	Our study 53.5%	Chinenye et al[1] 52.6%	Iloh et al [2] 61.7%	Ajayi et al [3] 32.5%

UKPDS , Kumamoto and ADVANCE studies have shown that tight glycaemic control can delay the onset and progression of DN. [4,5,6]

Poor glycaemic control have been shown to be risk factor for overt nephropathy amongst diabetics [7]

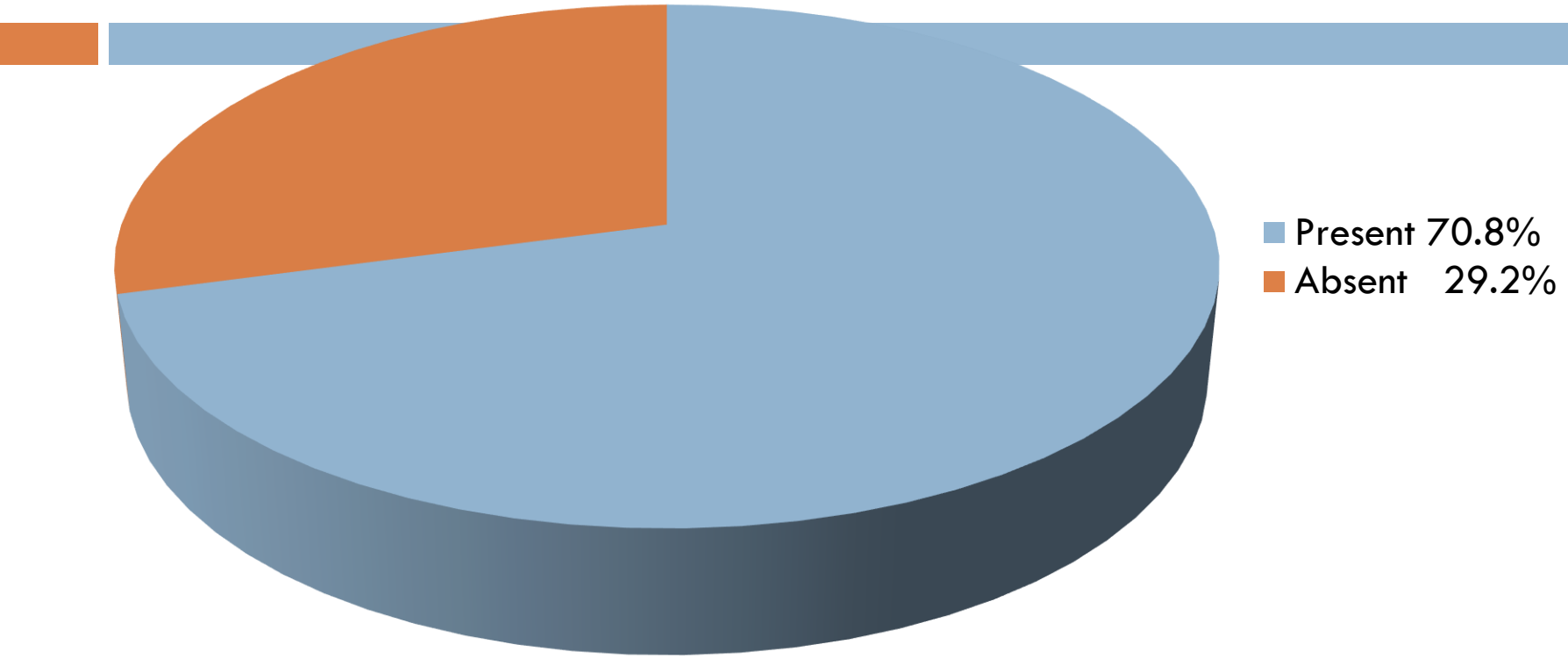
BMI



Studies establishing BMI > 24.9kg/m^2	Our study 74.3%	Ajayi et al [3] 48.7%	Dousi et al [8] 86%	Adebisi et al [9] 55.3%(males) 71.4%(females)

Overweight and obesity have been shown to be commoner in diabetics with nephropathy. [10]

METABOLIC SYNDROME



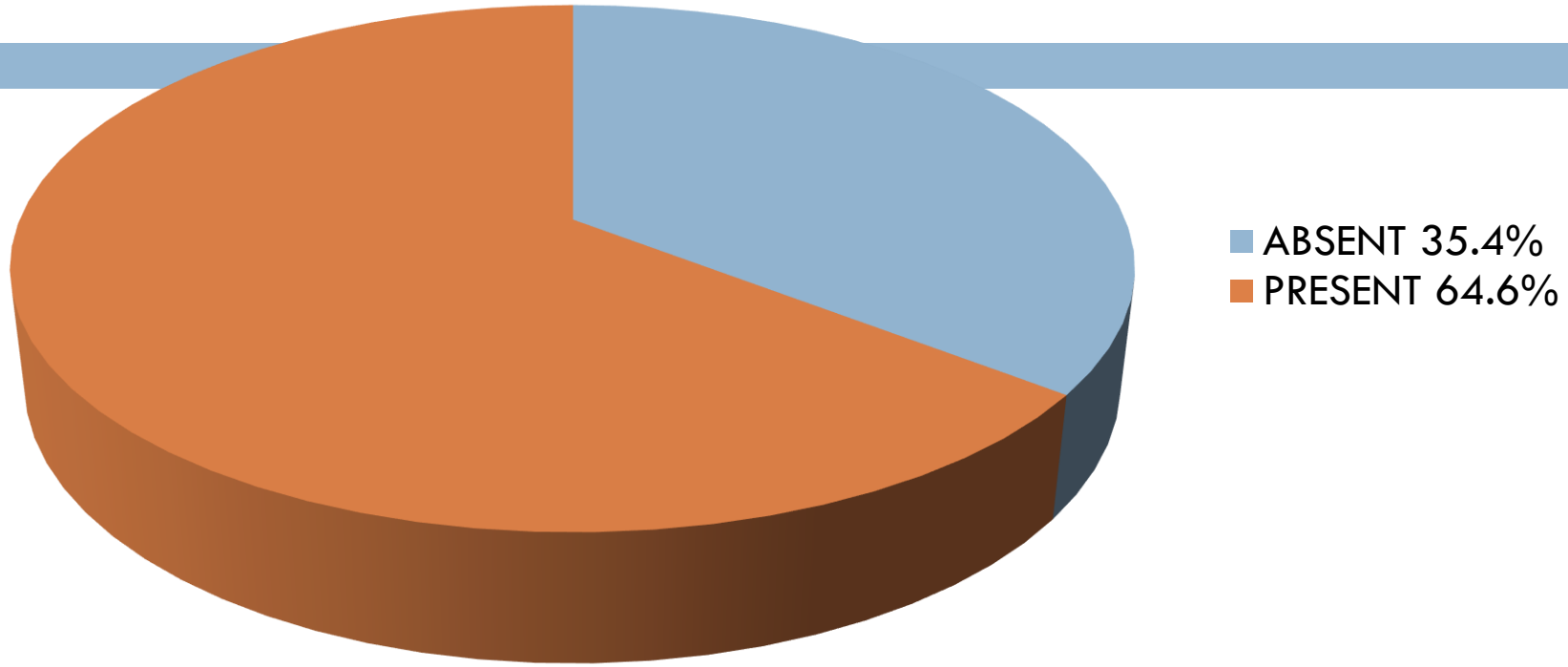
Studies	Our Study	Unadike et al [11]	Puepet et al [12]	Ogbera [13]
	70.8%	62.5%	63.6%	86%

An association has been established between MetS and CKD independent of conventional risks factors like age, sex, glycaemic control, albuminuria and disease duration. [14]

Association btw MetS, BP& Glycaemic control

VARIABLE	P value
MetS vs BP control	**< 0.001**
MetS VS Glycaemic control	0.866

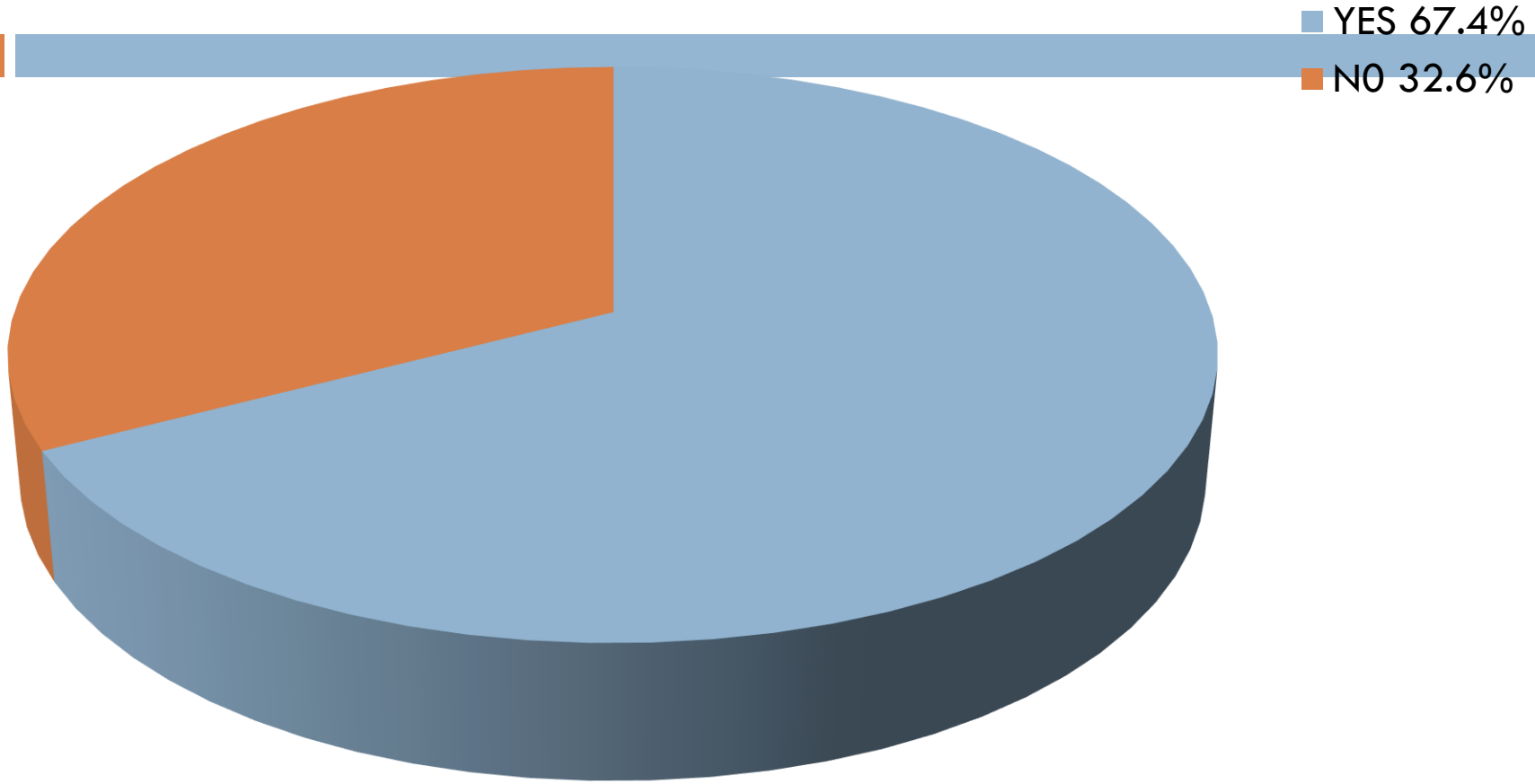
DYSLIPIDAEMIA



Studies	Our study	Agboola et al [15]	Ogbera et al [16]	Vezi et al [17]
	64.6%	60.5%	89%	90.3%

Dyslipidaemia has been shown to be associated with glomerular injury and an established risk factor for diabetic nephropathy.[18,19]

HYPERTENSION

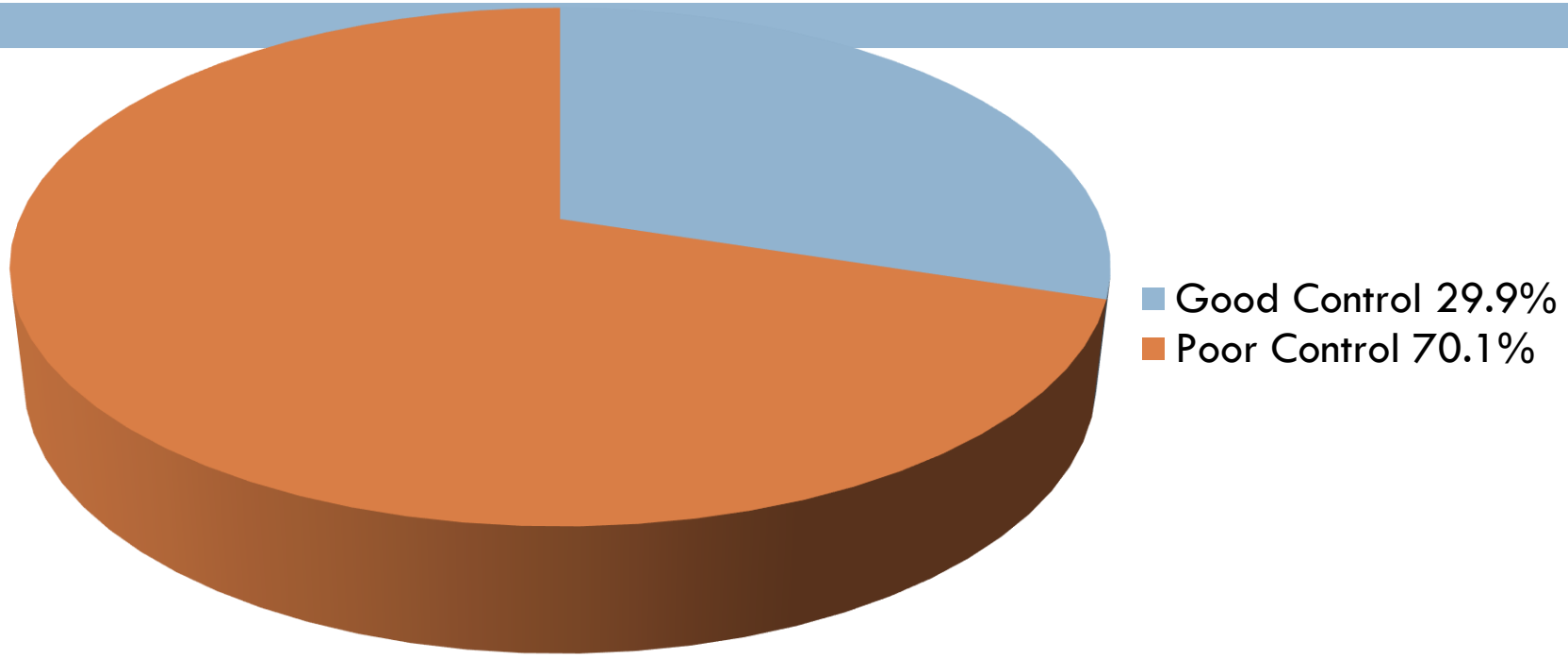


Studies	Our study	Ajayi et al [3]	Chineye et al [1]
	67.4%	76.3%	60.9%

Correlation between Age, BMI & BP

Parameter		P value
AGE vs SBP		**<0.001**
AGE vs DBP		0.610
BMI vs SBP		0.377
BMI vsDBP		**0.001**

BP Control



Studies	Our Study 29.9%	Ajayi et al [3] 24.5%	Ogbera et al[16] 17.2%

- **UKPDS, ABCD Trial have shown that tight BP control reduces both macrovascular and micro vascular complicatons in diabetic. [4,20]**
- **Hypertension has been shown to be a risk factor for diabetic nephropathy in Nigerian diabetics [7]**

Limitation of study

We could not use glycated haemoglobin to assess glycaemic control due to financial constraint.

CONCLUSION

- **The risk factors for CKD in type 2 diabetic patients attending UBTH were highly prevalent.**

- **Efforts should be geared towards modifying these risk factors in order to prevent or slow down development of CKD.**

REFERENCES

1. **Sunday Chinenye, Andrew E. Uloko, Anthonia O Ogbera, Esther N. Ofoegbu, Olufemi A. Fasanmade, Adesoji A. Fasanmade, Osi O. Ogbu. Profile of Nigerians with diabetes mellitus – Diabcare Nigeria study group (2008): Results of a multicenter study. Indian J Endocrinol Metab. 2012 Jul-Aug; 16(4): 558–564.**

2. **Iloh GU Pascal, John N Ofoedu, Njoku P Ucvhenna, Amadi A Nkwa, Godswill-Uko E Uchamma. Blood Glucose Control and Medication Adherence Among Adult Type 2 Diabetic Nigerians Attending A Primary Care Clinic in Under-resourced Environment of Eastern Nigeria N Am J Med Sci. 2012 July; 4(7): 310–315.**

3. E. A. Ajayi , A. O. Ajayi , O. E. Olalekan . Treatment to targets in type 2 diabetics: analysis of out-patients practice at a remote Western Nigerian hospital Internet Journal of Medical Update 2010 July;5(2):8-14

4.Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). UK Prospective Diabetes Study (UKPDS) Group. [No authors listed] Lancet 1999; Aug 14;354(9178):602.

5.Motoaki S, Kishikawa H, Ohkubo Y, Wake N. Long-Term Results of the Kumamoto Study on Optimal Diabetes Control in Type 2 Diabetic Patients. Diabetes Care 23 (Suppl. 2) 2000 (Suppl.2):21–29

6.Bakris G, Viberti G, Weston WM. Intensive Blood Glucose Control and Vascular Outcomes in Patients with Type 2 Diabetes. The ADVANCE Collaborative Group. N Engl J Med 2008; 358:2560-2572

7.Ibrahim A, Arogundade FA, Sanusi AA, Ikem R, Akintomide AO et al.Which factor actually influence the development and progression of overt nephropathy in Nigerian diabetic. Cent Afri J Med 2009 May-Aug;55(5);28-34

8. Daousi C, Casson IF, Gill GV, Mac Farlane IA, Wilding JP et al. Prevalence of obesity in type 2 DM in secondary care: association with cardiovascular risk factor. Post grad Med J 2006 Apr; 82(966):280-2849.

9. Adebisi SA, Oghagbon EK. Prevalence of obesity among diabetic in Ilorin, Middle belt of Nigeria. Sahel Journal.Vol 6(4) 2003:112-115

10. Idogun ES, Unuigbe EI, Famodu AA, Akinola OT. Body mass index in type 2 diabetes mellitus complications: Hypertensive diabetic and diabetic nephropathy. Niger Postgrad Med J 2006 March: 13(1): 17-20

11. Unadike BC, Akpan NA, Peters EJ, Essien IO, Essien OE. Prevalence of the metabolic syndrome among patients with type 2 diabetes mellitus in Uyo, Nigeria. AJEM 2009; 8(1): 7-9

12.Puepet FH, Uloko A, Akogun IY, Aniekwensi E. Prevalence of the metabolic syndrome among patients with type 2 diabetes mellitus in urban North-Central Nigeria. AJEM 2009: 8(1): 10-12

13.Ogbera OA. Prevalence and gender distribution of metabolic syndrome. Diabetol Metab Syndr 2010:2(1):1-5

14. Andrea OY, Wing-Yee SO, Ronald CW, Alice PS, Risa O Metabolic Syndrome Predicts New Onset of Chronic Kidney Disease in 5,829 Patients With Type 2 Diabetes. A 5-year prospective analysis of the Hong Kong Diabetes Registry Diabetes Care 2008; 31:2357–2361

15. Agboola-Abu CF, Onabolu A. Plasma lipid levels in patients attending Igbinedion hospital and medical research centre, Okada, Edo State, Nigeria. Nig Med J 2000;38:1-5.

16.Ogbera AO, Fasanmade OA, Chinenye S, Akinlade A. Characterization of lipid parameters in diabetes mellitus-a Nigerian report. Int Arch Med 2009;2:19.

17. Vezi ZB, Waidoo DP. Dyslipidaemia among black patients with type 2 diabetes. Cardiovasc J S Afr 2005 Jul-Aug; 16(4): 194-198

18. Muntner P, Coresh J, Smith JC, Eckfeldt J, Klag JM. Plasma lipids and risk of developing renal dysfunction: The Atherosclerosis Risk In Communities. Kidney Int 2000; 58: 293–301

19. Gall MA, Hougaard P, Borch-Johnsen K, Parving HH. Risk factors for development of incipient and overt diabetic nephropathy in participants with non-insulin dependent diabetes mellitus: Prospective observational study. Br Med J 1997; 314: 783–788

20. Estacio RO, Jeffers BW, Gifford N, Schrier RW. Effect of blood pressure control on diabetic microvascular complications in patients with hypertension and type 2 diabetes. Diabetes Care. 2000 Apr;23 Suppl 2:54-64.