



A STUDY ON DIABETES IS A PROGRESSIVE DISORDER THAT LEADS TO SERIOUS COMPLICATIONS

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Article Received on 09/10/2023

Article Revised on 30/10/2023

Article Accepted on 19/11/2023

ABSTRACT

Introductions: Diabetes is a chronic heterogenous metabolic disorder that effects the way the body processes blood sugars. Diabetes is a metabolic syndrome known as SYNDROME X or INSULIN RESISTANCE SYNDROME. This is a long term or chronic condition that decreases the glucose metabolism which leads to increased glucose circulating in the blood stream eventually results in high blood glucose levels. These increased levels lead to various disorders of the circulatory, nervous and immune systems. Diabetes is a progressive disorder that leads to serious complications, which are associated with increased costs to the family, community, and healthcare system. Uncontrolled diabetes leads to increased risk of vascular disease and much of the burden of type 2 diabetes is caused by macrovascular (cardiovascular (CV), cerebrovascular, and peripheral artery disease) and microvascular (diabetic retinopathy, nephropathy, and neuropathy) complications. **Aim:** To determine the prevalence of microvascular and macrovascular complications of Type 2 diabetes mellitus and their risk factors. **Methods:** This is a Cross sectional study design. This is an observational study conducted over a period of 6 months from November 2021 to April 2022 at Lalitha super speciality hospital in an in- patient department. The individuals who met the inclusion criteria are taken into consideration. The patients are included according to their interests and willingness in order to carry out the study. The study was conducted in LAITHA SUPER SPECIALITY HOSPITALS [multi centred hospital]. The study will be carried out for a period of 6 months. **Results:** The results of this study of prevalence of microvascular and Macrovascular complications of Type-2 diabetes was males were more prone to the diabetes mellitus, 61-70 is the most common age group, duration of diabetes for developing complications in the most was 1-5yrs, Risk factors that aggravate the complication prevalence include hypertension, and also most of them didn't have any risk factors yet developed complications which may be due to several factors i.e., diet, diabetic control. Majority of the people that developed complications have good to fair diabetes control. Mostly developed complication was CAD in Macrovascular complication and neuropathy in microvascular complication. **Conclusion:** The conclusion of the study of prevalence of microvascular and macrovascular complications, macrovascular complications are more prevalent, in which cardiovascular disease has the highest incidence rate. There are many risk factors that influence the complication prevalence which include hypertension, obesity, alcohol, smoking and age, of which HTN seem to increase the prevalence or incidence of complications among the diabetic people.

KEYWORDS: Diabetes, Diabetes Mellitus, CAD, CVA, PVD, Microvascular, Macrovascular, Complications, Neuropathy, Nephropathy, Retinopathy, Hyperglycemia, Blood, Prevalence, Risk, Risk Factor, Incidence, Disease, Disorder.

INTRODUCTION

Diabetes: Diabetes is a chronic heterogenous metabolic disorder that effects the way the body processes blood sugars. Diabetes is a metabolic syndrome known as SYNDROME X or INSULIN RESISTANCE SYNDROME. Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that

regulates blood sugar. Hyperglycemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels.

This is a long term or chronic condition that decreases the glucose metabolism which leads to increased glucose circulating in the blood stream eventually

results in high blood glucose levels. These increased levels lead to various disorders of the circulatory, nervous and immune systems. Diabetes is a progressive disorder that leads to serious complications, which are associated with increased costs to the family, community, and healthcare system. Uncontrolled

diabetes leads to increased risk of vascular disease and much of the burden of type 2 diabetes is caused by macrovascular (cardiovascular (CV), cerebrovascular, and peripheral artery disease) and microvascular (diabetic retinopathy, nephropathy, and neuropathy) complications.

1. Distribution based on complications and duration of diabetes.

Table 9: Distribution Based on Complications and Duration of Diabetes.

DURATION OF DIABETES	CAD	CVA	PVD	NEUROPATHY	NEPHROPATHY	RETINOPATHY
01-05	82(20.5%)	56(14.00%)	1(0.25%)	43(10.75%)	40(10%)	29(7.25%)
06-10	70(17.5%)	47(11.75%)	0(0%)	70(17.5%)	32(8%)	24(6%)
11-15	38(9.5%)	16(4.0%)	2(0.5%)	29(7.25%)	31(7.75%)	12(3%)
16-20	17(4.25%)	21(5.25%)	0(0%)	22(5.5%)	21(5.25%)	16(4%)
21-25	11(2.75%)	03(0.75%)	0(0%)	8(2%)	07(1.75%)	07(1.75%)
26-30	02(0.5%)	05(1.25%)	0(0%)	3(0.75%)	06(1.5%)	01(0.25%)
31-35	00(0.0%)	00(0%)	0(0%)	0(0%)	00(0%)	00(0%)
36-40	02(0.5%)	01(0.25%)	0(0%)	2(0.5%)	00(0%)	01(0.25%)

Table shows distribution based on complications and duration of diabetes of study population. These 400 patients were divided into according to the duration of diabetes. These patients were divided into 5 groups according to the duration of diabetes i.e, patients with DOD 1-5years were 251 [82(20.5%) CAD, 56(14%) CVA, 1(0.25%) PVD, 43(10.75%) Neuropathy, 40 (10%) nephropathy, 29(7.25%) retinopathy], patients with 6 -10 years were 243[70(17.5%)CAD, 47(11.75%) CVA, 70(17.5%) Neuropathy, 32(8%) nephropathy, 24(6%) retinopathy], patients with 11-15years were 128[38(9.5%)CAD, 16(4%)CVA, 2(0.5%) PVD,

29(7.25%) neuropathy, 31(7.75%) nephropathy, 12(3%) retinopathy], 16-20 were 97[17(4.25%) CAD, 21(5.25%)CVA, 22(5.5%) Neuropathy, 21(5.25%) nephropathy, 16(4%) retinopathy], 21-25years were 36[11(2.75%) CAD, 3(0.75%) CVA, 8(2%) Neuropathy, 7(1.75%) nephropathy, 7(1.75%) retinopathy], 26 -30 years were 17[2(0.5%)CAD, 5(1.25%) CVA, 3(0.75%) neuropathy, 6(1.5%) nephropathy, 1(0.25%) retinopathy], 36-40 years were 6[2(0.5%) CAD, 1(0.25%) CVA, 2(0.5%) neuropathy, 1(0.25%) retinopathy].

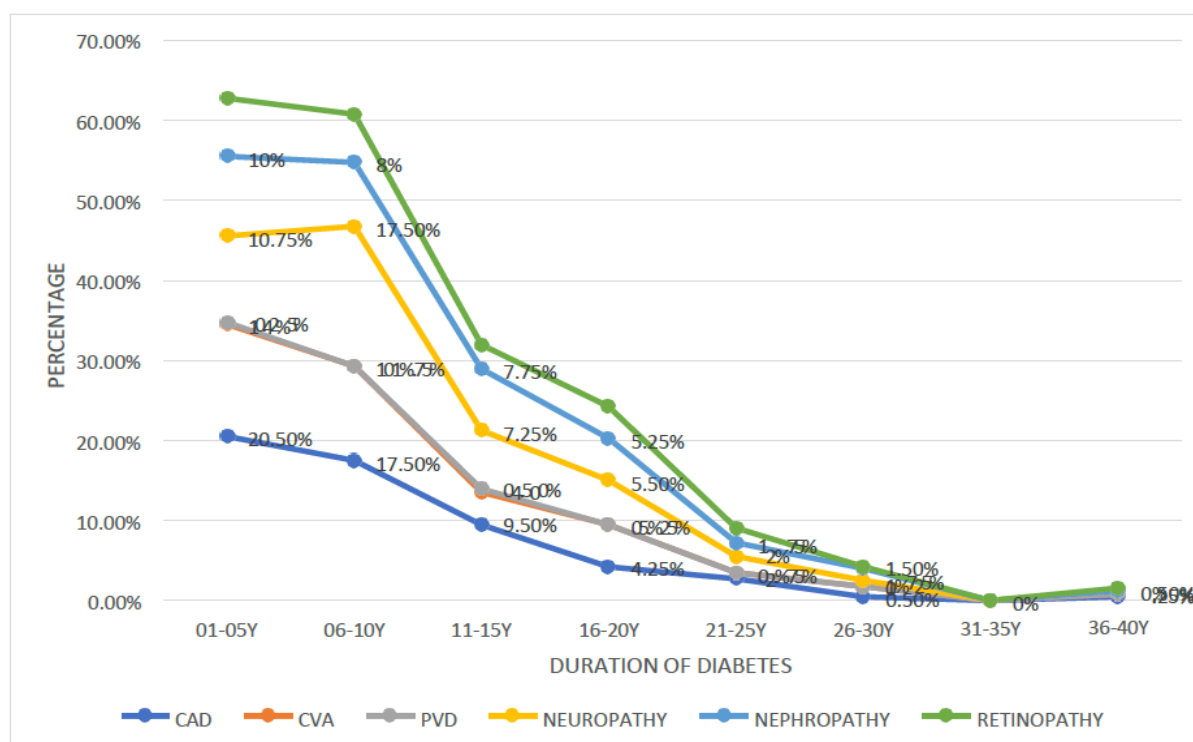


Chart 9: Distribution Based on Complications and Duration of Diabetes.

2. DISTRIBUTION BASED ON COMPLICATIONS AND AGE GROUP.

Table 10: Distribution Based On Complications And Age Group.

AGE	CAD	CVA	PVD	NEUROPATHY	NEPHROPATHY	RETINOPATHY
35-45	23(5.75%)	21(5.25%)	0	22(5.5%)	16(4%)	7(1.75%)
46-55	57(14.25%)	26(6.5%)	0	50(12.5%)	39(9.75%)	19(4.75%)
56-65	87(21.75%)	58(14.5 %)	0	58(14.5%)	46(11.5%)	29(7.25%)
66-75	52(13%)	38(9.5%)	3(0.75 %)	41(10.25%)	33(8.25%)	31(7.75%)
76-85	5(1.25%)	10(2.5%)	0	9(2.25%)	4(1%)	4(1%)
86-95	1(0.25%)	1(0.25%)	0	1(0.25%)	0	0

Table shows distribution based on complications and age group of study population. These 400 patients were divided according to their age group and also based on their complications i.e, patients with age between 35-45 years 89[23(5.75%) CAD, 21(5.25%) CVA, 22(5.5%) neuropathy, 16(4%) nephropathy, 7(1.75%) retinopathy]. Patient's with age between 46 to 55 years 191[57(14.25%) CAD, 26(6.5%) CVA, 50(12.5%) Neuropathy, 39(9.75%) nephropathy, 19(4.65%) retinopathy];56 to 65 years 278[87(21.75%)

CAD, 58(14.5%) CVA,58(14.5%) neuropathy, 46(11.5%) nephropathy, 29(7.25%) retinopathy]; 66 to 75 years 198[52(13%) CAD, 38(9.5%) CVA, 3(0.75%) PVD, 41(10.25) Neuropathy, 33(8.25%) nephropathy, 31(7.75%) retinopathy]; 76 to 85 years 32[5(1.25%) CAD, 10(2.5%) CVA, 9(2.25%) Neuropathy, 4(1%) nephropathy,4(1%) retinopathy]; 86 to 95 years 3 [1(0.25%)each case of CAD, CVA and neuropathy].

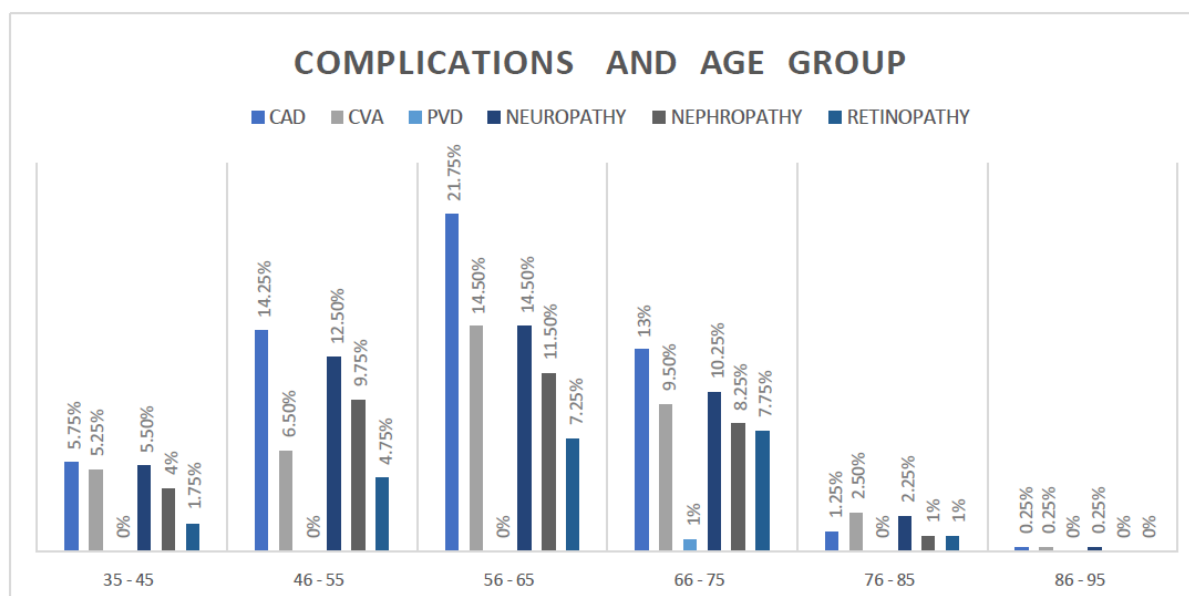


Chart 10: Distribution Based On Complications and Age Group.

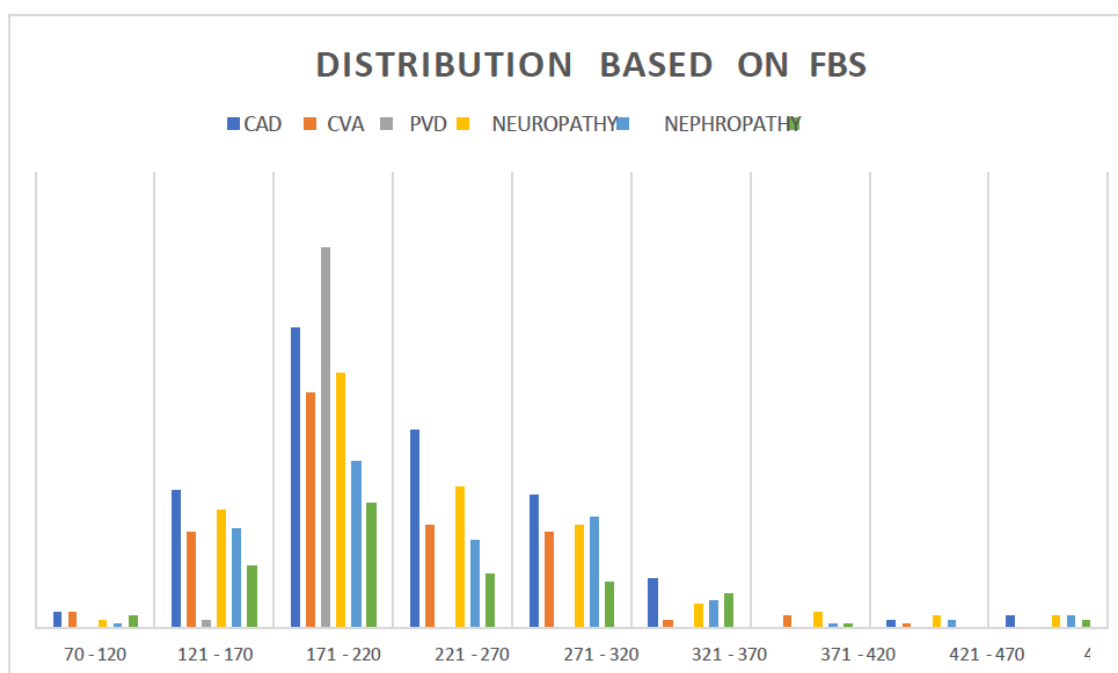
3. DISTRIBUTION BASED ON FBS

Table 11: distribution based on FBS.

FBS	CAD	CVA	PVD	NEUROPATHY	NEPHROPATHY	RETINOPATHY
70-120	4(1%)	4(1%)	0	2(0.5%)	1(0.25%)	3(0.75%)
121-170	36(9%)	25(6.25%)	2(0.5%)	31(7.75%)	26(6.5%)	16(4%)
171-220	79(19.75%)	62(15.5%)	1(0.25%)	67(16.75%)	44(11%)	33(8.25%)
221-270	52(13%)	27(6.75%)	0	37(9.25%)	23(5.75%)	14(3.5%)
271-320	35(8.75%)	25(6.25%)	0	27(6.75%)	29(7.25%)	12(3%)
321-370	13(3.25%)	2(0.5%)	0	6(1.5%)	7(1.75%)	9(2.25%)
371-420	0	3(0.75%)	0	4(1%)	1(0.25%)	1(0.25%)
421-470	2(0.5%)	1(0.25%)	0	3(0.75%)	2(0.5%)	0
471-530	3(0.75%)	0	0	3(0.75%)	3(0.75%)	2(0.5%)

Table shows: Distribution based on FBS and complications of study people. These 400 type 2 diabetic patients were divided according to their FBS values and also based on their complications i.e., patients with FBS value between 70 to 120 [4(1%) CAD, 4(1%) CVA, 2(0.5%) Neuropathy, 1(0.25%) nephropathy, 3(0.75%) retinopathy]; 121 to 170 [36(9%) CAD, 25(6.25%) CVA, 2 (0.5%) PVD, 31(7.75%) neuropathy, 26(6.5%) nephropathy, 16(4%) retinopathy]; 171 to 220 [79(19.75%) CAD, 62(15.5%) CVA, 1(0.25%) PVD, 67(16.75%) Neuropathy, 44(11%) nephropathy, 33(8.25%) retinopathy]; 221 to 270 [52(13%) CAD, 27(6.75%) CVA, 37(9.25%) neuropathy, 23(5.75%)

nephropathy, 14(3.5%) retinopathy]; 271 to 320 [35(8.75%) CAD, 25(6.25%) CVA, 27(6.75%) Neuropathy, 29(7.25%) nephropathy, 12(3%) retinopathy]; 321 to 370 [13(3.25%) CAD, 2(0.5%) CVA, 6(1.5%) Neuropathy, 7(1.75%) nephropathy, 9(2.25%) retinopathy]; 371 to 420 [3(0.75%) CVA, 4(1%) Neuropathy, 1(0.25) each case of nephropathy and retinopathy]; 421 to 470 [2(0.5%) CAD, 1(0.25%) CVA, 3(0.75%) Neuropathy, 2(0.5%) nephropathy]; 471 to 530 [3(0.75%) each case of CAD, Neuropathy and nephropathy, 2(0.5%) retinopathy].



CONCLUSION

- Our study results indicate that prevalence of microvascular and Macrovascular complications of Type-2 diabetes was high in males, 61-70 is the most common age group, duration of diabetes for developing complications in the most was 1-5 yrs, Risk factors that aggravate the complication prevalence include hypertension, and also most of them didn't have any risk factors yet developed complications which may be due to several factors i.e., diet, diabetic control. Macrovascular complications are more prevalent in which cardiovascular disease has the highest incidence rate. The mostly developed complication was CAD in Macrovascular complication and neuropathy in microvascular complication.
- This study results show that HTN was highly associated with vascular complications of type 2 DM. BP control is highly important in preventing vascular complications among patients type 2 DM and physicians should be aware of self-management of BP, especially for type 2 DM

patients with HTN comorbidity.

- Adoption of appropriate diet, exercise behaviors and adherence to medication regimens will result in desired glycemic control, along with controlled BP and blood lipids, will greatly reduce the burden of diabetes complications.

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