Section: General Medicine

Original Research Article

CLINICAL STUDY ON COMPLICATIONS OF DIABETES MELLITUS

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Abstract

Background: Diabetes and its complications continue to be a major global health issue, affecting millions of people worldwide. Despite advancements in treatment and management, diabetes remains a leading cause of morbidity and mortality, and ongoing research is needed to improve prevention, diagnosis, and treatment strategies. The aim of this study was to evaluate the complications of diabetes mellitus. **Materials and Methods:** The present prospective hospital based observational study included 100 patients of long standing diabetes. Diagnosis of complications of diabetes involved a combination of physical exams, laboratory tests, and imaging studies, such as eye exams, nerve conduction studies, and kidney function tests. All the necessary details were documented and analyzed. All the patients underwent detailed history taking, thorough clinical examination and necessary investigations. Data was collected in MS Excel and presented as numbers and percentages in the form of tables and figures. **Result:** The gender distribution depicted 52% males and 48% females. The age distribution showed that most of the subjects belonged to the age group of >60 years followed by the age group 40-60 years and then 20-40 years. The complications in our study population were microvascular – Diabetic Retinopathy(15%), Diabetic Nephropathy(14%), Diabetic Neuropathy(14%) and macrovascular – Peripheral Artery Disease(5%), Coronary Artery Disease(19%), Stroke(6%). **Conclusion:** Screening for diabetes is an important tool for early detection and prevention of complications, such as kidney disease, neuropathy, and cardiovascular disease. Ongoing research aims to better understand the mechanisms behind these complications and develop new treatments to improve outcomes for people with diabetes.

INTRODUCTION

Diabetes is a major global health problem, with an estimated 463 million adults living with the condition worldwide.[1] India has a particularly high prevalence of diabetes, with an estimated 77 million adults affected, making it one of the countries with the highest burden of diabetes in the world.[2] The rising prevalence of diabetes in India is attributed to factors such as rapid urbanization, sedentary lifestyles, and unhealthy diets.

Diabetes mellitus, commonly referred to as diabetes, is a chronic metabolic disorder that affects the way the body processes blood sugar (glucose).[3] There are two main types of diabetes: Type 1 diabetes, which occurs when the body's immune system attacks and destroys insulin-producing cells in the pancreas, and Type 2 diabetes, which occurs when the body becomes resistant to insulin or does not produce enough insulin. Symptoms of diabetes include frequent urination, increased thirst and hunger, fatigue, blurred vision, and slow wound healing. Diabetes is diagnosed through blood sugar tests, such as fasting blood sugar and oral glucose tolerance tests. Treatment for diabetes may include lifestyle modifications such as diet and exercise, medications to lower blood sugar levels, and insulin therapy.[4] Diabetes can lead to both microvascular and macrovascular complications. Microvascular complications affect the small blood vessels and include diabetic retinopathy (eye disease), diabetic neuropathy (nerve damage), and diabetic nephropathy (kidney disease). Macrovascular complications affect the large blood vessels and increase the risk of heart attack, stroke, and peripheral artery disease. Poorly controlled blood sugar levels, high blood pressure, and high cholesterol levels can increase the risk of both microvascular and macrovascular complications.[5]

Research on complications of diabetes aims to understand the underlying mechanisms and risk factors of microvascular and macrovascular complications, as well as to develop effective

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prevention and treatment strategies. Studies have shown that early detection and management of diabetes-related complications can significantly improve outcomes and quality of life for individuals with diabetes.[6,7] Ongoing research continues to focus on identifying new targets and approaches for preventing and treating diabetes-related complications.

MATERIALS AND METHODS

Study Setting: The present study was conducted at the Department of Medicine, Gandhi Medical College, Hyderabad, Telangana.
Study Design: The present study was a Prospective Hospital based Observational study.

Study Sample: 100 long standing diabetic patients who consented were included in the study.
Inclusion Criteria
Subjects with long standing diabetes and who consented were included in the study.
Exclusion Criteria
Subjects who did not consent and those with chronic systemic illnesses were excluded from the study.
Methodology
Complications were made a diagnosis based on standard guidelines defining them. All the necessary details were documented and analyzed. All the patients underwent detailed history taking, thorough clinical examination and necessary investigations.
Statistical Analysis
Data was collected in MS Excel and presented as numbers and percentages in the form of tables and figures.

RESULTS

Table 1: Gender Distribution

Gender	No. Of Patients(%)
Male	52(52%)
Female	48(48%)

As depicted in the above table, there was a male predominance in our study.

Table 2: Age Distribution

Age	No. Of Patients(%)
20-40 Years	22(22%)
40-60 Years	30(30%)
> 60 Years	48(48%)

Most of the subjects belonged to the age group of >60 years followed by the age group 40-60 years and then 20-40 years.

Table 3: Complications

Complications	No. Of Patients(%)
Microvascular Complications	
Diabetic Retinopathy	15(15%)
Diabetic Nephropathy	14(14%)
Diabetic Neuropathy	14(14%)
Macrovascular Complications	
Peripheral Artery Disease	5(5%)
Coronary Artery Disease	19(19%)
Stroke	6(6%)

The various complications in our study population have been depicted in the above table.

DISCUSSION

Diabetes is a significant global health problem, affecting millions of people and increasing the risk of various health complications. The present prospective hospital based observational study included 100 patients of long-standing diabetes and aimed at studying the complications of diabetes. Complications of diabetes can be broadly classified as microvascular complications and macrovascular complications. The pathogenesis of microvascular complications in diabetes involves damage to the small blood vessels due to chronic hyperglycemia. High glucose levels lead to oxidative stress, inflammation, and the activation of various signaling pathways, including the polyol pathway and the advanced glycation end product (AGE) pathway. These pathways contribute to damage to the endothelial cells that line the small blood vessels, leading to impaired blood flow and damage to the surrounding tissues. This can result in diabetic retinopathy, neuropathy, and nephropathy, which are common microvascular complications of diabetes. Prevention and management of these complications focus on tight glycemic control and the reduction of other risk factors such as high blood pressure and high cholesterol levels. The

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mechanisms underlying macrovascular complications of diabetes are complex and multifactorial, but they are largely related to the development of atherosclerosis. Chronically high blood sugar levels and other cardiovascular risk factors such as high blood pressure, high cholesterol, and inflammation contribute to the development of fatty plaques in the walls of large blood vessels. These plaques can rupture, leading to the formation of blood clots that can block blood flow to the heart, brain, or limbs, causing a heart attack, stroke, or peripheral artery disease. In addition, high blood sugar levels can also cause dysfunction of the cells that line the blood vessels, leading to endothelial dysfunction and impaired blood flow. In our present study, the gender distribution depicted 52% males and 48% females. The age distribution showed that most of the subjects belonged to the age group of >60 years followed by the age group 40-60 years and then 20-40 years. The complications in our study population were microvascular – Diabetic Retinopathy (15%), Diabetic Nephropathy (14%), Diabetic Neuropathy (14%) and macrovascular – Peripheral Artery Disease (5%), Coronary Artery Disease (19%), Stroke (6%). Similar Results were obtained by Ankush et al, Ramachandran et al and Liu et al.[8-10]

CONCLUSION

Screening for diabetes is an important tool for early detection and prevention of complications, such as kidney disease, neuropathy, and cardiovascular disease. Ongoing research aims to better understand the mechanisms behind these complications and develop new treatments to improve outcomes for people with diabetes.

Ethical Clearance: Ethical clearance was obtained from the Institiutional ethics committee prior to the commencement of the study.

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