



Case Study

Diabetes Mellitus: A stitch in time saves Nine Early Diagnosis and Management minimizes complications- A Case Study

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Received: 03 August, 2021

Accepted: 09 August, 2021

Published: 10 August, 2021

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Keywords: Diabetic mellitus; Hyperglycaemias; Insulin; Oral hypoglycaemic drugs

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Abstract

Diabetes mellitus is a group of metabolic diseases in which the person has high blood glucose level, either due to inadequate insulin secretion or because the body's cells do not respond properly to the insulin or both. It has multiple aetiology characterised by hyperglycaemia, and disturbances of carbohydrates, proteins, and fat metabolism. For many years it can be silent without any suffering and be identified only when symptoms like persistent weight loss, blurring of vision or nonhealing wound or even diabetic ketoacidosis, stroke, kidney failure, and cardiovascular disease occur. When presented with symptoms of excessive urination, increased thirst, and hunger it is easy to recognize and manage.

We present one such Clinical case of a- 54 years old, housewife, reported of excessive urination, sudden weight loss, blurred vision, increased thirst, fatigue, and excessive sweating. She was experiencing these conditions from April 2021 onwards but was alarmed and reported to Punya hospital Bangalore in May 2021. After a thorough examination and random blood glucose check (189mg/dl), was diagnosed as Diabetic and was put on oral anti-diabetics. While the follow-up visit is due next week, she has nearly 70% relief from her symptoms.

Introduction

Diabetes Mellitus(DM) is a group of metabolic disorders which results in high blood glucose level for a long period resulting from defect in insulin production, insulin action or both [1,2]. There are more than 73 million people suffering from diabetes [2] globally and India contributes 50 million of them. This number is projected to increase to 79.4 million globally by the year 2030. 6–12% of urban and 2–3% of rural Indians have diabetes [3]. Diabetes symptoms if present may include excessive thirst, frequent urination, sweating, sudden weight loss, fatigue, and slow healing sores [4]. Diabetes mellitus has been known since antiquity, its treatments were known

since the middle Ages, and the elucidation of its pathogenesis occurred mainly in the 20th century [5]. DM is an important cause of morbidity and mortality all over the world. With an estimated 46% of cases currently undiagnosed, millions of people are unaware of their increased risk for developing diabetes-related complications, due to lack of awareness, and devoid of alerting symptoms and signs most patients with DM are recognized only when they have some complications [6,7]. Self-management of DM aims at normalizing blood glucose content and reducing the risk of long-term complications. Ideally, the rationale, implementation and goals of self-management are formulated in close collaboration between the person with DM and the health care team [6].

Pathogenesis

'Alpha cells' in the islets of Langerhans produce an important hormone called glucagon and important role in controlling blood glucose. The beta cells in Pancreas that produce insulin are attacked by the body's immune system. As more beta cells get killed off, the pancreas struggles to produce enough insulin to keep blood sugar levels down and the symptoms of diabetes begin to appear. Diabetes is classified in to 3 types, type I, type II and gestational diabetes [8].

Type 1 diabetes

In type 1 diabetes, the body's immune system attacks the beta cells in the pancreas. When the beta cells are lost there is not sufficient insulin for proper control of glucose levels. Resulting high sugar levels in the blood can cause damage to the kidneys, eyes, nervous system, and other organs. Neither the cause of Type 1 diabetes nor the means to prevent it are known. Symptoms include excessive excretion of urine (polyuria), thirst (polydipsia), constant hunger, weight loss, vision changes, and fatigue. These symptoms may occur suddenly.

Type 2 diabetes

In type 2 diabetes, the body builds up resistance to insulin and more insulin is needed to bring down blood glucose levels. Basically, it results from the body's ineffective use of insulin. Majority of diabetics have type 2 diabetes, mostly due overweight and physical inactivity. The condition may be diagnosed several years after onset, after complications like diabetic foot ulcers, retinopathy etc. have already arisen. Until recently, seen only in adults, type 2 diabetes is now increasingly occurring in children also.

Gestational diabetes

Gestational diabetes is temporary hyperglycaemia with blood glucose values above normal but below those diagnostics of diabetes. Gestational diabetes occurs during pregnancy. Women with gestational diabetes are at an increased risk of complications during pregnancy and at delivery and children born to such women are also at increased risk of type 2 diabetes in the future. Gestational diabetes is usually diagnosed through prenatal screening [3].

Case presentation

A Clinical case of a 54-year-old female, housewife visited on May 2021 Puna hospital Bangalore with the complaints of excessive urination, sudden weight loss, blurred vision, increased thirst, fatigue and excessive sweating for last one month.

Past medical history

Patient was suffering from Hypertension from Last 5 years for which she was using Tenormin (Atenolol) 50mg OD and had noticed the current symptoms since April 2021, but reported to the hospital due to weight loss and blurred vision a month and half later.

General examination

Weight: 55kg, Height: 5 foot 2 inches, BMI: 32.01kg/m².

Physical activity: daily routine household work.

Investigation

Random blood glucose level was 189mg/dl and her fasting glucose next day was 134mg/dl.

Diagnosis: Based on these she was diagnosed as a case of Type-2 diabetic.

Treatment

Neodipar-250mg BD (Metformin HCL) 5 -10 minutes before both main meals.

Instead of eating a lot at 3 meals, was advised divide total in in 5 helpings.

Drug interaction was checked, as there was no interaction was present b/w Atenolol and Metformin she was put on them.

Outcome

Patient used the suggested medicine Neodipar twice a day after using one month medicine the blood glucose level of the patient was monitored.

Fasting = 104mg/dl, After meal = 140mg/dl,

HbA1c=4.2 mmol/mol.

{HbA1c is your average blood glucose levels for the last two to three months. Diabetics have an HbA1c level of 4.8mmol/mol (6.5%) or below}

Discussion

The typical symptoms are excessive urination, increased thirst, and hunger, rarely exhibited as was experienced by our case. The major risks of diabetes are genetics, overweight and sedentary life, as was seen our case, the lady hardly was used to do any physical exercises, though in this case the patient had no family history of Diabetes. The case was diagnosed in an early stage, therefore it responded well to single drug i.e., Metformin. Small meals help in keeping the blood sugar under control as our case experience within a short period of 2-3 weeks. Diabetic condition needs to be addressed by medicines and non - pharmacological methods such as 1) doing exercise, 2) by stopping intake of high sugar content food. Basic principles of medications is to use injectable (Insulin) just before a meal and other oral hypoglycaemia agents be taken after 30-40 minutes of each meal. In a single drug regimen, it is advised to be taken (as advised in our case) just 5-10 minutes before main meals. Patient on oral hypoglycaemic agents and not taking food as per body need and the type of work they do may suffer from hypoglycaemia a state that can be more dangerous than the hyperglycaemia.

According to a study published in the Lancet, The latest statistics from the health ministry shows that the lifestyle



diseases are rampant in Bangalore. In Bangalore 14% people are suffering from diabetes [9].

A cross sectional study was conducted in a village with a population of 5,948 in Gadag district, Karnataka. Stratified random sampling technique was used. There were 246 adults in the selected age group. Prevalence of diabetes is 19.91% of the adult population in this village appears to be three times higher than the ICMR study. Main risk factors are obesity, Family history, high blood pressure. The situation demands the need for early diagnosis and treatment and all out efforts in our efforts in changing the life styles for their prevention and reducing the incidence [7].

Epidemiological data from different parts of India show a rising prevalence of diabetes. Oral glucose tolerance testing, although still a valid mechanism for diagnosing DM, is not recommended as part of the routine care, as OGTT may be difficult to perform in field studies and the cost and demands on participants 'time may be excessive. Therefore, for epidemiological studies, the revised criteria for the diagnosis of diabetes emphasize fasting plasma glucose as a reliable and convenient test for diagnosing DM in asymptomatic individuals [10].

The studies conducted in community's estimates the prevalence of DM in rural areas from 4.3% to 10%. The findings of other studies suggest the prevalence was high in the age group of 45 to 69 years. The age group divisions of males and females were not uniform in most of the studies. Main risk factors are obesity, smoking, high blood pressure. The ICMR study conducted in urban areas of cities in India shows higher prevalence of DM and the other study finds the similar observation in Belagavi city. Most of the studies shown higher prevalence among the population aged 60 years and above [11].

A Population based cross sectional study by Ranjit Mohan Anjana, et al. (2017) reported an overall prevalence of diabetes in all 15 states of India was 7.3% (95% CI 7.0-7.5). In rural areas of all states, diabetes was more prevalent in individuals of higher SES. However, in urban areas of some of the more affluent states (Chandigarh, Maharashtra, and Tamil Nadu), diabetes prevalence was higher in people with lower SES. The overall prevalence of prediabetes in all 15 states was 10.3% (10.0-10.6). Age, male sex, obesity, hypertension, and family history of diabetes were independent risk factors for diabetes in both urban and rural areas. The spread of diabetes to economically disadvantaged sections of society is a matter of great concern, warranting urgent preventive measures [12].

The worldwide prevalence of Diabetes Mellitus (DM) has risen dramatically in the developing countries over the past two decades. Diabetes Mellitus is emerging as a major health-care challenge for India. In a population-based cross-sectional study using random blood sugar sampling carried out in the Rural and Urban field practice area of tertiary care medical teaching institute in Patiala, showed an overall the prevalence of DM of 10.0% (7.4% in Rural & 12.6% in Urban Area). Known DM was 6.9% of study population and undiagnosed DM being 3.1% subjects. Significant association was seen between

prevalence of DM and age, Obesity and Hypertension. It was observed that the prevalence of DM is higher in urban area as compared to Rural Area. Adults with age >40 years, Obesity and Hypertension are more likely to develop Diabetes Mellitus. Control of DM mandates lifestyle modification and control of risk factors [13].

Conclusion

Successful self-management of DM requires that individuals with disease frequently monitors their blood glucose levels and take required action to keep blood sugar within physiological level. There are many glucometers in the market costing around INR 1000. Each time test strip costs about INR 30-35. Recently Freestyle Libre Sensor Flash Glucometer have hit the market, which is a step ahead of the future. It lets us to check our blood glucose levels without pricking anything into your skin. Blood glucose level is checked by simply performing an easy scan. They are not yet popular in India as a daily recurring cost would be roughly INR 200 per day.

Desired level of blood sugar can be achieved by self-management education, self-monitoring, and social support. Cultural influences may interfere successful self-management of DM.

Treating diabetes as a public health problem means understanding and appreciating that it affects not only individuals but also families, communities, and society. The further you move from the individual to societal interventions, the more complex and multifactorial the approaches become, the longer it can take to achieve change, and the more difficult it is to evaluate, but the impact is more far-reaching.

While much of the work in improving diabetes outcomes has focused on clinical care, there is growing recognition that improving diabetes prevention and control also requires public health approaches that are complementary to what can be achieved in clinical care. For people with diabetes, medical concerns are not the only factors that need to be managed, lifestyle, family, psychosocial, cultural, and economic matters also warrant attention. For people at high risk for developing type 2 diabetes often referred to as pre-diabetes, the non-medical factors are even more important. The healthcare delivery system should take the lead in screening, diagnosis and disease care as early as possible, and Public health attempts health protection, promotion, prevention, and preparation [14].

The goals of diabetes management are 1) To prevent or treat the many complications that can result from the disease itself and from its treatment. 2) By keeping the blood sugar level under control, diabetes can become patient's companion and she can enjoy life joyfully. 3) Diet control, exercises, and anti-diabetic drugs are the main stay of management of diabetes case recognised early. 4) Avoiding hypoglycaemia is equally important to be kept in mind.

Take home messages

Diabetes is a common disease, often asymptomatic.

Periodical fasting Blood sugar levels estimation is the easy way of screening for diabetes.



Can be managed with Proper diet, low carbohydrate, low fat high roughage diet, regular aerobic exercises (walking, Cycling etc) and strengthening muscle masses.

References

- Rothman-Kabir Y (2018) 1 Diabetes. Parental Vigilant Care 118-123.
- Cho NH, Kirigia J, MbanyaJC, Ogurstova K, Guariguata L, et al. (2017) Eighth edition 2017. IDF Diabetes Atlas. 8th edition 1-150. [Link: https://bit.ly/3yAOxfB](https://bit.ly/3yAOxfB)
- Chandra P, Gogate B, Gogate P, Thite N, Mutha A, et al. (2015) Economic Burden of Diabetes in Urban Indians. Open Ophthalmol J 8: 91-94. [Link: https://bit.ly/3jEVvdd](https://bit.ly/3jEVvdd)
- Cooke DW, Plotnick L (2008) Management of diabetic ketoacidosis in children and adolescents. *Pediatr Rev* 29: 431–436. [Link: https://bit.ly/3lWcjii](https://bit.ly/3lWcjii)
- Piero MN, Nzaro GM, Njagi JM (2015) Diabetes mellitus – a devastating metabolic disorder. *Asian J Biomed Pharm Sci* 4: 1–7. [Link: https://bit.ly/3iziWW3](https://bit.ly/3iziWW3)
- Kisokanth G, Prathapan S, Indrakumar J, Joseph J (2013) Factor influencing self - management of Diabetes Mellitus; a review article. *J Diabetol* 3: 1-7. [Link: https://bit.ly/3yC5p5A](https://bit.ly/3yC5p5A)
- Patil VK (2018) Prevalence of diabetes and hypertension and management practices in a village of Gadag District,Karnataka,India.
- .Book reviews (2012) Mobilization. 85: 2012.
- Indus Health Plus. Karnataka Health Statistics – Public Health Status in Karnataka [Internet]. 2014. [Link: https://bit.ly/3AuJGNg](https://bit.ly/3AuJGNg)
- Rao CR, Kamath VG, Shetty A, Kamath A (2010) A study on the prevalence of type 2 diabetes in coastal Karnataka. *Int J Diabetes Dev Ctries* 30: 80–85. [Link: https://bit.ly/2VDYeLu](https://bit.ly/2VDYeLu)
- Shrinivas Sangappa Tamboli RB (2018) Prevalence of Diabetes Mellitus in Families and Population of Rural District of Southern Karnataka: Community Based Study. *Asian J Pharm Clin Res* 11: 94-99.
- Anjana RM, Deepa M, Pradeepa R, Mahanta J, Narain K, et al. (2017) Prevalence of diabetes and prediabetes in 15 states of India: results from the ICMR–INDIAB population-based cross-sectional study. *Lancet Diabetes Endocrinol* 5: 585–596. [Link: https://bit.ly/3CwUbjJ](https://bit.ly/3CwUbjJ)
- Niti S, Amrit V, Gupta BP, Jasdeep S (2016) Prevalence and Risk Factors of Diabetes Mellitus among Adults residing in Field Practice Area of a Teaching Hospital in Punjab. *Heal J* 6: 57–62. [Link: https://bit.ly/3lNvzyA](https://bit.ly/3lNvzyA)
- Albright A (2008) Public health practice and diabetes-what more can be done to halt the epidemic? *US Endocrinol* 4: 16–19. [Link: https://bit.ly/3ivblyI](https://bit.ly/3ivblyI)

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Citation: Kumar A, Suresh K (2021) Diabetes Mellitus: A stitch in time saves Nine Early Diagnosis and Management minimizes complications- A Case Study. *Glob J Obes Diabetes Metab Syndr* 8(2): 014-017. DOI: <https://dx.doi.org/10.17352/2455-8583.000052>