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Case Report of a Person aged 105 years old with Type 2 Diabetes

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Introduction

In developing countries, the burden of diabetes is rapidly increasing, with most people with diabetes being in the age range of 45 – 64 years.[1] Diabetes affects 10–25% of older people (older than 65 years) worldwide, with exceptionally high rates in populations such as Pima Indians, Mexican- Americans, and South Asians.[2] In India, 11.5 percent were diagnosed with diabetes, or high blood sugar levels were over the age group of 45 years, according to the study conducted by the Union Ministry of Family and Health Welfare (MoFHW). The prevalence of diabetes in adults aged 20years or older in India increased from 5.5% in 1990 to 7.7% in 2016.[3] The current life expectancy for Asian Indians is 67 years for males and 69 years for females; it reduces by 6-8 years in patients with type 2 diabetes mellitus.[4]

Changes in body composition with an accumulation of fat in the abdomen are a key factor in the causation of diabetes in the aging population. The size and strength of skeletal muscle, a major tissue involved in glucose metabolism, also declines, leading to muscle weakness and a reduction in physical activity. These changes lead to a marked decrease in energy expenditure and abdominal fat accumulation, causing insulin resistance. Elderly persons with diabetes mellitus have considerable economic, social, and health burdens.

Case Report

A 105 years old male patient came to the hospital with complaints of generalized weakness for three days and fluctuating blood sugars for two weeks. The patient was diagnosed with Diabetes Mellitus in the past 35 years ago; he has been on regular oral hypoglycemic agents and sub-cutaneous Insulin. Systemic hypertension for the past 30 years and is on regular medications. At the time of admission, his Glycemic control was unsatisfactory, with HbA1c of 12.9% & CBG - 441 mg/dl. The patient was started on Insulin infusion and tapered. For better Glycemic control, he was started on a basal-bolus regimen.

Laboratory findings revealed that all the hematological and biochemistry panel was normal, except for serum creatinine, which was 1.4, eGFR, 40, and the glycated hemoglobin was 12.9%. A special investigation like Doppler revealed normal blood circulation in both the legs, Biothesiometry revealed significant neuropathy; Monofilament test showed Protective sensation absolutely nil. 2DEcho showed Normal LV function with Posterior Mitral Calcification EF-63%. He had undergone cataract surgery for both eyes five years back.

Discussion

Diabetes Mellitus in the elderly includes two groups: "survivors" of young or middle-aged onset of diabetes and incident diabetes in older age or type 2 DM. Diabetes occurs at an increased frequency in the elderly due to decreased physical activity. Diabetes is the 6th most common cause of death in the older population. Type 2 DM (Diabetes Mellitus) with age more than 90 years observed to have less BMI due to poor eating habits, decreased appetite, weight loss due to sarcopenia, or any associated illness. Diabetic complications like hypertension, peripheral neuropathy, PVD (Peripheral vascular disease), and Coronary artery disease were significantly higher in elderly patients. Kidney disease in elderly

patients may also reflect other causes of chronic kidney disease or age-related decline in renal function. Not unexpectedly, neuropathy, PAD, and CAD were more common in the ≥ 90 years group compared to the 50 – 60 years age group. When comparing long-term survivors and non-survivors with Type 2 DM, survivors showed better control of glycemia, blood pressure, and dyslipidemia.[5]

The International Diabetes Federation (IDF) divides old patients into three functional groups. The first category includes functionally independent patients who rely on their own. The second category comprises patients who are not autonomous, which means they are functionally dependent on someone else. The second subcategory includes patients with dementia, which means they have cognitive impairment and cannot self-care. The third group includes patients at the end of life care.[6] The patient was under the second category as he was functionally dependent.

The glycemic target varies according to the patient's health status and life expectancy. The hemoglobin A1c (HbA1c) is below 7% for physically fit and cognitively intact, A1c 7% to 7.5% for elderly patients without significant co-morbidity, and A1c between 7.5% and 8% for fragile patients.

Lifestyle modification is necessary at any stage of disease, but the fear of falls and any rheumatic disease may limit the practice. An astringent diet is a good alternative; however financial problems, social isolation, memory loss, dental problems, and changes in their taste may negatively impact the diet. Our patient followed the dietician's advice and avoided non-veg to prevent indigestion problems. Physical activity like walking inside the house was performed only to fulfill the basic requirements.

DM treatment in old people should obey the fundamental rule "Go slowly and individualize. All types of oral hypoglycemic drugs (OHA) are safe choices for elderly patients, although each medication has some limitations due to hypoglycemic risk or co-morbidity. Insulin is under-utilized due to the fear of hypoglycemia by patients and clinicians worldwide. The patient was initially on premixed insulin and sitagliptin, later changed to basal-bolus insulin as his HbA1c was high.

Previous studies of the very elderly with diabetes showed that 24.4% were treated with OHA, 2.2% with insulin, and the rest with diet.[7] A study showed 85% of T2DM patients ≥ 90 years were on OHA, and 12% were on insulin. The majority of the Elderly patients were on OHA like sulphonylureas like Gliclazide and Glimipride; a Study from China also showed that sulphonylurea was the most used as it was well tolerated by the elderly. Insulin will be administrated if any co-morbid condition of the patient precludes the use of oral medication or failure of oral medications in achieving glycemic control.[5]

Conclusion:

Diabetes in the elderly population is growing into epidemic proportions throughout the world. Tight metabolic control should be the goal of therapy but may not be safe in all elderly patients because of comorbidities and the risk of hypoglycemia. Whether on insulin or oral drugs, self-monitoring of blood glucose will help reduce the chances of severe hypoglycemia. Treating high blood pressure and lowering lipids are more beneficial in the elderly, a group highly susceptible to cardiovascular morbidity and mortality. Physical exercise improves muscle strength and endurance and improves insulin sensitivity. Lifestyle modifications to prevent weight gain, especially abdominal accumulation of fat, is essential for preventing and treating diabetes.

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