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A Case Report on Clinicians Challenge in Prescribing Oral Hypoglycemics in Type 2 Diabetes Mellitus with Coexisting Diseases

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ABSTRACT: The array of diseases in the diabetic population makes it critical to establish personalized therapy. This case report concerns a 66-year-old male with a previous history of an old hemorrhagic cerebrovascular accident, rheumatic heart disease with mitral valve regurgitation 20 years ago, hypertension, psychiatric illness, and current medication use. The patient complained of fever, cough with sputum, swaying, and altered sensorium. Lab investigations revealed elevated glycated hemoglobin (HbA1C - 13.5 %) and random blood sugar (RBS) levels of 469 mg/dL, indicating newly diagnosed type 2 diabetes mellitus. During the hospital stay, the patient was successfully treated with insulin. However, upon discharge, the patient refused to continue insulin therapy, posing a challenge for the physician in tailoring alternative treatment options according to the patient's comorbidities. The choice of oral hypoglycemic agents in geriatric patients who are unwilling to take insulin therapy remains controversial, and further studies are needed to evaluate the effectiveness and safety of various OHAs in geriatric patients with multiple comorbidities who are unwilling to take insulin therapy.

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INTRODUCTION:

Type 2 diabetes mellitus (T2DM) has emerged as a significant global public health concern. In India, the prevalence has risen to 15.0 % in rural areas and 19.0 % in urban areas between 2015 and 2019, underscoring its growing impact [1]. T2DM is commonly associated with microvascular and macrovascular complications, leading to increased morbidity and mortality rates. Achieving stable blood sugar levels is central to managing T2DM [2]. Glycosylated Hemoglobin (HbA1C) serves as a crucial indicator for measuring glycemic control, with a

target of maintaining HbA1C below 7 % in elderly individuals [3]. The methods of treatment for type 2 diabetes mellitus have undergone significant changes in recent years due to advancements in medicine [4]. Individualizing therapy is particularly essential for patients with newly diagnosed T2DM and concurrent comorbidities. The primary consideration is how to effectively achieve glycemic control while minimizing adverse effects. When selecting medications, several factors should be taken into account, including their effectiveness in lowering A1C levels, the risk of hypoglycemia, impact on weight, potential side effects, cost, simplicity of administration, and patient preferences. By emphasizing the need for personalized treatment approaches in T2DM, and considering the diverse criteria influencing medication selection, healthcare professionals can strive to attain optimal glycemic control and improve patient outcomes [3]. The aim of this case report is to highlight the challenges faced by clinicians and manage the therapy according to individual patient conditions.

CASE REPORT:

A 66-year-old male presented with complaints of fever, cough with sputum for one day, and morning episodes of swaying and altered sensorium. The patient had a past medical history of an old hemorrhagic cerebrovascular accident, rheumatic heart disease with previous mitral valve regurgitation 20 years ago, hypertension for 15 years, and psychiatric illness. The patient was on multiple medications including Tab. WARF (warfarin) 5 mg 0-0-1, Tab. AMIFRU (Furosemide 40 mg + Amiloride 5 mg) 1/2 -0-0, Tab. MET XL (Metoprolol) 50 mg 1-0-0, Tab. LEVERA (Levetiracetam) 500 mg 1-0-1, and Tab. LORSAVE (Losartan) 25 mg 0-0-1.

Physical examinations and laboratory tests were performed, the results of which are shown in Table 1 and Table 2. Based on these investigations, the patient was additionally diagnosed with Type 2 diabetes mellitus and cholelithiasis. The following medications were prescribed during the 3-day hospital stay: Inj. VITE 10 mg, Inj. SILAXONE SB 1.5 gm 1-0-1, Inj. SILPAN (Pantoprazole) 40 mg 1-0-0, Tab. DOLO (Acetaminophen) 650 mg 1-1-1, Tab. LEVERA (Levetiracetam) 500 mg 1-0-1, Tab. MET XL (Metoprolol) 50 mg 1-0-0, Tab. LORSAVE (Losartan) 25 mg 0-0-1, Tab. WARF (Warfarin) 5 mg 0-0-1, Tab. AMIFRU 0.5 mg ½-0-0, Inj. INSUGEN R 12-12-10, Inj. INSULATARD 10-0-8, and Tab. GP 1-0-0.

Upon discharge, the patient was prescribed Glycomet GP, which is a combination of Glimipride 1 mg and metformin 500 mg. Despite insulin being the preferred choice of treatment, the patient declined insulin therapy, posing a challenge for the physician to select the most suitable oral hypoglycemic agents.

Table 1. The Physical examination.

Parameters	Value
Pulse rate	140 bpm
BP	130/80 mm of Hg
CVS	S1, S2 +, Metallic click +, No murmurs
RS	B/L Air entry +, No added sounds
P/A	Soft, non-tender
CNS	Conscious, Oriented

Table 2. Abnormal Laboratory findings.

Parameter	Result	Reference Range
Total Count	11980 cells/cumm	4000-11000 cells/cumm
Neutrophills	90 %	40-75 %
Lymphocytes	3 %	20-45 %
Prothrombin time test (PTT)	57.7 s	9-12 s
C Reactive protein	52.31 mg/L	<6 mg/L
Serum sodium	123.9 mmol/L	133-152 mmol/L
Serum chloride	90.38 mmol/L	96-106 mmol/L
Random blood glucose	469 mg/dl	<140 mg/dl
HbA1C	13.5 %	<5.6 %
Direct Bilirubin	0.3 mg/dl	<0.2 mg/dl
Indirect Bilirubin	0.9 mg/dl	0-0.6 mg/dl
A/G Ratio	1.8	1.0-1.5
Alkaline phosphatase (ALT)	137.4 U/L	30-120 U/L
Ultra-sonogram abdomen: Cholelithiasis – 12 mm		

DISCUSSION:

The majority of people with T2DM have one or more comorbidities that can impact the management of diabetes and its progression [5]. According to Diethelm, *et al.*, patients treated with insulin experienced a reduction in HbA1c of 1.5 %, while those treated with oral hypoglycemic agents (OHA's) had a reduction of 0.6 % [6]. In cases with higher initial HbA1c values, the initiation of either insulin with frequent hypoglycemia screenings or two antihyperglycemic agents is recommended [7]. Metformin monotherapy is less

effective in lowering HbA1c levels compared to combination therapy with two drugs [8]. In this particular case, a combination therapy of metformin and a second-generation sulfonylurea is being administered as a two-drug therapy.

CONCLUSION:

The choice of selecting OHA's in patients with newly diagnosed diabetes and other comorbidities is particularly difficult and remains as a challenge because of the lack of studies that have been proven the safety and efficacy of different OHA's. If in case the patient has to be prescribed with OHA's as alternative for insulin in patients who can't take it, frequent screening should be done.

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