Case Series of Diabetes Mellitus Type 2 Patient Presented with Atrial Fibrillation: Mechanism, and Therapeutical Modality

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Introduction: Beside coronary artery disease, cardiac electrical system is also an important target for diabetic damage. Diabetes Mellitus (DM) has become an independent risk factor for Atrial Fibrillation (AF). The aim of this case series to describe their relationship and modalities of therapy.

Methods: CASE ILLUSTRATION Case 1 52 y.o male, presented with generalized weakness, anorexia, vomitus, and palpitation. He had history of DMT2 and did not take medicine regularly. On physical examination: BP(120/80mmHg), Pulse (110x/minute irregular), RR(24x/minute), Temperature(37 degrees celcius). Cardio-pulmonary examinations were unremarkable. ECG showed AF RVR. Chest x-ray showed: no cardiomegaly. Laboratory studies: RBG(380mg/dL), Ketone(0.2mmol/L), Leucocytes(11.000/mm3). Insulin, digoxin, and ondancentrone were given to the patient. Case 2 70 y.o woman admitted to hospital due to new onset of sudden palpitation and dizziness. She had history of hypertension on regular Amlodipine and controlled type 2 diabetes mellitus. On physical examination, we found normal BP and irregular tachycardia. ECG: AF RVR. Blood glucose 368 mg/dL with normal blood ketone and serum potassium 5.5 mmol/L with normal eGFR. Digoxin, ISDN, clopidogrel and insulin therapy were given.

Result: Prospective data from large population based studies has established the relationship between LA size and Left ventricular (LV) hypertrophy have been associated with DM and abnormal glucose tolerance in several epidemiology studies and risk of developing AF. Thus increased the probability of stress hyperglycemia in sudden onset of rapid-response AF in our patient. Therapeutic options for AF in DM are anti-coagulant, upstream therapy, antiarrhythmic therapy and catheter ablation. This patient had score of CHA2DS2-VASc=4 and HASBLED=2 which indicates high risk of thromboembolism and should receive anti-coagulation therapy. Upstream therapy is using ARB which can decrease atrial fibrosis and structural remodelling. This patient should undergo further evaluation of hyperkalemia before receiving ARB as both upstream therapy and anti-hypertension. Despite of its benefits, catheter ablation was eliminated due to patient's advanced age.

Conclusion: Several patho-mechanisms such as autonomic system distortion, structural and electrical alterations were connected with glucose and insulin disturbances seen in patient with DM. Patient with hyperglycemia on DM and AF should receive anti-coagulant therapy and anti-arrhythmic drugs before cardioversion to restore the sinus rhythm, while still on regular DM treatment.