Geriatric Issue; Treatment of Hypertension and Chronic Kidney Disease in Diabetes Mellitus Patient

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Abstract  Hypertension is a common dilemma in patients with diabetes mellitus (DM) and increases the complications. Hypertension accelerates the progression of renal disease and may lead to end stage renal disease. A 70 years old, female, Malay, with a known history of type 2 diabetes mellitus (DM), stage 2 severe hypertension (HTN) and newly diagnosed chronic kidney disease (CKD). Patient was admitted to ward of Hospital Universiti Sains Malaysia (HUSM) for radiocephalic fistula creation on patient left arm (L-RCF). Patient was admitted for L-RCF and waiting for the surgery on the following day. Blood pressure (BP) was way above the threshold value for pharmacological treatment. She was suffering from diabetes 20 years ago and hypertension developed 5 years later. Furthermore, patient was newly diagnosed with CKD and in need for dialysis. Patient condition was worsening due to uncontrolled DM and she was on oral hypoglycemic agent. Surgery was postponed for a week and switched on Insulin plus oral hypoglycemic and normalized the BP by drug therapy. Patient was successfully underwent her surgery with minor pre-surgery complications and was treated with her anti-diabetic and antihypertensive medications.

Keywords  Chronic Kidney Disease, Diabetes Mellitus, Geriatric, Hypertension, Radiocephalic Fistula

1. Introduction

Hypertension is a common problem in patients with diabetes mellitus and a comorbid condition that enhances the risk of morbidity and mortality.1 In type 1 diabetes, the incidence of hypertension increases from 5% to 70% at the duration of 10 to 40 years, and appears to be closely related to diabetic renal disease.1 In type 2 diabetes, hypertension is even more prevalent.2 Hypertension should be detected and treated early in the course of DM to prevent cardiovascular disease and to delay the progression of renal disease and diabetic retinopathy. Hypertension accelerates the progression of renal disease and may lead to end stage renal disease (ESRD). Good control of BP is therefore important. The target BP should be < 130/80 mmHg for those with proteinuria of < 1g/24 hours and < 125/75 mmHg for those with proteinuria of > 1g/24 hours.3

2. Case Report

A 70 years old female, Malay in race, with a known history of type 2 diabetes mellitus (DM), stage 2 severe hypertension (HTN) and newly diagnosed chronic kidney disease (CKD). Patient claimed that based on self-monitoring BP measurement, the average systolic BP was 150-170 mmHg and diastolic BP was 80-60 mmHg. Patient was admitted in Hospital Universiti Sains Malaysia (HUSM) for radiocephalic fistula creation on her left arm (L-RCF). At the time of admission patient was nervous and on routine medication. On the day next, patient complained of having trouble sleeping especially late night. Patient blood pressure (BP) at that time was skyrocketing which was 206/60 mmHg and her pulse rate (PR) was 79 beats/min. For that condition, patient was on tablet Nifedipine 10 mg stat and her BP post 1 hour was 166/60 mmHg, PR=68. Patient was being monitored closely for any symptoms or complications due to drop in her BP and Aspirin tablet was withheld (Table 1). Regarding uncontrolled diabetic condition patient was switched on Insulin with gliclazide oral.

With one week interval, patient BP and diabetic level were normalized and was prepared for L-RCF surgery. Three hours post operation, the patient was comfortable and being prescribed with Paracetamol 1g tablet TDS. Patient was discharged with her current medications plus Paracetamol 1g tablet TDS. Aspirin tablet was restart and her BP before discharged was 179/65 mmHg.

3. Discussion
The exact hypotensive mechanism of β-blockers is not known but may involve decreased cardiac output through negative chronotropic and inotropic effects on the heart and inhibition of renin release from the kidney. Atenolol has relatively long half-life and are excreted through urine; the dosage may need to be reduced in patients with moderate to severe renal insufficiency. The addition of low doses of a thiazide diuretic can increase efficacy significantly of Angiotensin II Receptor Blocker (ARB), which is Irbesartan. In patients with type 2 diabetes and nephropathy, ARB therapy has been shown to significantly reduce progression of nephropathy. Calcium Channel Blockers are useful add-on agents for BP control in hypertensive patients with diabetes. Limited data suggest that nondihydropyridines may have more renal protective effects than dihydropyridines. Aspirin was prescribed to high risk patients of Coronary Heart Disease (CHD) as a prophylaxis. The regimen was stopped a day before to allow surgery. Same as aspirin, it was prescribed as a prophylaxis for patients with CHD risk. These drugs were prescribed to control the blood sugar level of patient. The usage of these drugs needs to be monitored closely and the dose may need to be reduced due to her renal problem.

Generally, pharmacological treatment should be initiated in patients with diabetes when the BP is persistently >130 mmHg systolic and/or >80 mmHg diastolic. Tight BP control should take precedence over the class of antihypertensive drug used. This often will require oral combination therapy. There are suggestions that a lower target BP may be necessary to maximally protect against the development and progression of cardiovascular and diabetic renal disease. In general, the systolic blood pressure (SBP) should be targeted to <130 mmHg and diastolic blood pressure (DBP) <80 mmHg. The BP should be lowered even further to <125/75 mmHg in the presence of proteinuria of >1 g/24 hours.

Before surgery, unstable BP and uncontrolled diabetes prolong the hospital stay and need to change the medications. Insulin and tablet Nifedipine 10mg was provided to treat her problem. At the discharge time patient BP (196/64 mmHg) was high and concluded that patient was asymptomatic and no complications occurring.

In such condition, Angiotensin Converting Enzyme Inhibitors (ACEI) is the drug of choice, if patient can tolerate, otherwise an Angiotensin receptor blocker (ARB) should be considered. Furthermore, in cases of slow progressing of nephropathy at the microalbuminuric stage or overt nephropathy stage in type 2 diabetic patients, ARB should be a better choice.

Diuretics can be used as initial therapy or added-on when monotherapy is inadequate. The lowest possible dose should be used to minimize adverse metabolic effects. However, adverse metabolic effects with higher doses of diuretics have also been reportedly reduced when used in combination with an Angiotensin Converting Enzyme Inhibitors (ACEI) or an Angiotensin receptor blocker (ARB).

### 4. Conclusions

Present patient was successfully prepared to surgery with pre-surgery complications and was treated with anti-diabetic and antihypertensive medications. World Health Organization and most guidelines strongly recommended that before surgery, patient should switch on Insulin and control BP. Current case was switched on insulin and got better outcomes, whereas Aspirin should be avoided.

### REFERENCES


