*Scenario: Patient CB has a history of strokes. The patient has been diagnosed with type 2 diabetes, hypertension, and hyperlipidemia. Drugs currently prescribed include the following:*

* *Glipizide 10 mg po daily*
* *HCTZ 25 mg daily*
* *Atenolol 25 mg po daily*
* *Hydralazine 25 mg qid*
* *Simvastatin 80 mg daily*
* *Verapamil 180 mg CD daily*

**Factors Affecting Pharmacokinetic and Pharmacodynamics Processes**

Diabetes mellitus is one of the common medical problems. The number of patients diagnosed with diabetes is raising due to physical inactivity leading to obesity. One of the main problem with diabetes is complication related to the disease. Diabetes is associated with a progression of microvascular (e.g. nephropathy, neuropathy, retinopathy) and macrovascular (e.g. myocardial infarction, stroke) complications. Most people with type 2 diabetes are obese and the degree of duration of obesity correlates with the risk of the diabetes. Obesity and inactivity are two of the most important lifestyle risk factors for type 2 diabetes. It has been observed that changes in lifestyle and a moderate level of physical activity can prevent type 2 diabetes.

Dostalek, Akhlaghi & Puzanovova (2012) elaborates that diabetes may influence the pharmacokinetics of numerous drugs by affecting the absorption, due to changes in muscle blood flow and delayed gastric emptying; distribution, due to non-enzymatic glyon-enzymatic glycation of albumin; biotransformation, due to differential regulation of enzymes involved in drug biotransformation and drug transporters; and  excretion, due to nephropathy, the use of drugs by patients with diabetes is expectedly higher than in an age-matched population without the disease

**Patient’s Recommended Drug Therapy.**

The patient drug therapy includes Glipizide 10 mg po daily, HCTZ 25 mg daily, Atenolol 25 mg po daily, Hydralazine 25 mg qid, Simvastatin 80 mg daily and Verapamil 180 mg CD daily. HCTZ 25 mg daily are high doses are contraindicated for patient with diabetes and hypertension. It is effective in patient with creatine clearance above 30ml/min. Atenolol 25 mg po daily is advantageous in patient with stroke. Hydralazine 25 mg is beneficial if used in black patient with heart failure. Simvastatin 80 mg daily is a high intensity statin and this tends to increase risk of myopathy and rhabdomyolysis. Verapamil 180 mg CD daily it should be avoided in patient with AV node dysfunction or left ventricular dysfunction (Arcangelo, Peterson, Wilbur & Reinhold, 2017).

**The Patient’s Drug Therapy Plan.**

The patient is on Glipizide 10 mg po daily. The dosage increment for this drug is 2.5–5 mg depending on the patient response, as determined by blood glucose response. The maximum recommended once daily dose is 15 mg. Doses above 15 mg should ordinarily be divided and given before meals of adequate caloric content. The maximum recommended total daily dose is 40 mg (Drugs.com, 2018).

HCTZ 25 mg daily, The recommended patient initial dose 25 mg once daily and the maintenance dose can increase to 50 mg daily. While used with other anterhypentesive drug the max dose is 50mg once a day (Drugs.com, 2018).

Atenolol 25 mg po daily the recommended initial dose is 50 mg orally once a day and the maintenance dose is 50 to 100 mg orally once a day lastly the maximum dose is 100 mg per day. The atenolol dose for this patient will be increased to 50 mg(Drugs.com, 2018).

Hydralazine 25 mg qid. The initial dose is 25 mg bid. This can be increased gradually to the maximum dose of 200 mg daily. The dose should not be increased beyond 100 mg daily without first checking the patient's acetylator status (Drugs.com, 2018).

Simvastatin 80 mg daily the most prescribed dosage is 5 to 40 mg/day mostly in patients with CHD or at high risk of CHD. The recommended usual starting dose is 10 or 20 mg once a day in the evening. In patients at high risk for a CHD event due to existing CHD, diabetes, peripheral vessel disease, history of stroke or other cerebrovascular disease, the recommended starting dose is 40 mg/day. Lipid determinations should be performed after 4 weeks of therapy and periodically thereafter. Therefore, the 80-mg dose of ZOCOR should be used only in patients who have been taking simvastatin 80 mg chronically (e.g., for 12 months or more) without evidence of muscle toxicity. Limit the dose of simvastatin in patients on verapamil to 10 mg daily (Drugs.com, 2018).

Verapamil 180 mg CD daily this drug should be individualize based on the patient factors that include age, ethnicity/race, comorbidities, cardiovascular risk. The initial dose is 180 mg orally once a day at bedtime. The maximum dose is 480 mg/day. Titration should be based on therapeutic efficacy and safety evaluated weekly and approximately 24 hours after the previous dose (Drugs.com, 2018).

Reference

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