

11/19/2020

## **“Diabetes & the Role of a Pharmacist” - University of Hawai’i**

- Meeting starts at 6:07 PM
- Dr. Jarred Prudencio, pharmD, University of Hawai’i at Hilo
  - Assistant professor at UH Hilo DKICP
  - Ambulatory care clinical pharmacist
  - Specialties
    - Management of chronic diseases (diabetes, cardiology, respiratory, etc)
    - Family medicine
- Diabetes mellitus
  - Condition resulting in high blood glucose (sugar) levels
    - Medical terminology - hyperglycemia
      - Hyper = high
      - Glyc = sugar
      - Emia = blood
  - One of the most
- Complications of diabetes
  - Macrovascular vs microvascular
    - Macrovascular complications: heart attack, stroke, coronary artery disease
    - microvascular: retinopathy, neuropathy, nephropathy
- Type 1 vs type 2 diabetes
  - Two primary types of diabetes are very different
  - Commonalities: both result in high blood sugar and have same complication if uncontrolled
  - Type 1 more common in children to 30 years of age, autoimmune condition, no insulin production, no prevention, less common
  - Type 2 metabolic condition more common among older ppl, some insulin production, may be preventable
- Immune system attacks pancreatic beta cells in type 1 pathology of diabetes resulting in no insulin production
- Type 2: insulin resistance and overproduction of glucose
  - More complex pathway than type 1 diabetes
  - High blood sugar generated by a series of problems/steps
- Goals of treatment
  - Maintain a normal level of blood sugar and prevention complications
  - Fasting blood sugar for a patient without diabetes should be <100 mg/dL
  - pre-diabetes : 100-125 mg/dL
  - diabetes : >126 mg/dL
  - Hemoglobin A1c is also important and looked at

- Once diagnosed with diabetes, the goal is to keep fasting blood sugar between 80-130 mg/dL and hemoglobin A1c level of less than 7%
- Diet and exercise
  - Helps lower blood sugar, particularly for type 2 diabetes
  - Exercise recommendations
    - At least 150 minutes of exercise per week over a minimum of 5 days
  - Dietary (recommendations): diabetic plate method
    - 50%: non-starchy vegetables, leafy greens (not potatoes)
    - 25%: starch, whole grain
    - 25%: lean meats or protein
    - Minimize carbohydrate intake
- Hypoglycemia = low blood sugar
  - If medication or prevention methods work too well than it can result in hypoglycemia
  - Symptoms: shakiness, cold sweets, confusion, dizziness
  - Treatment: 15/15 rule
    - Eat 15 grams of carbohydrates, wait 15 minutes
- Medications
  - Medication treatment is a key part of controlling diabetes and preventing complications
  - 7 primary groups of medications for diabetes treatment
- Insulin
  - Natural hormone of the body
  - Can be used to treat type 1 or type 2 diabetes
  - Insulin moves the glucose from the blood into the cells so that it can be stored and used for energy later
    - Complications arise when glucose is high level staying in blood
  - As a medication, insulin is administered as a subcutaneous injection (into abdomen, thigh, back of arm)
  - Different types of insulin = rapid acting, intermediate-acting, or long-acting
  - New inhalant form of insulin!
- Biguanides
  - Medication: metformin
  - Mechanism of action
    - Decreases hepatic gluconeogenesis
    - Decreases intestinal absorption of glucose
    - Increases insulin sensitivity at muscle cells
  - Benefit: does not cause weight gain, rare incidence of hypoglycemia
  - Lowers A1c by 1-2%
  - Common side effect is stomach upset

- “Front-line medication” for type 2
- Sulfonylureas
  - Medication: glipizide, glyburide, glimepiride
  - Mechanism of action
    - Stimulates insulin release from pancreas
  - Benefit: older, cheap medicine
  - Common side effects: hypoglycemia, weight gain
  - Caution in elderly patients
  - Avoid in patients with allergy to sulfa medicines
- Thiazolidinediones (TZD)
  - medication
  - Cannot use in patients with heart failure
  - Causes water weight gain
- Dipeptidyl peptidase 4 (DPP4) inhibitors
  - Medications: all end in gliptin
  - Is an enzyme
  - The medication inhibits the enzymes and the enzyme breaks down incretins
  - Doesn't cause weight gain, rare incidence of hypoglycemia
- Glucagon-like peptide-1 (GLP1) agonists
  - GLP1 is an incretin
  - Same end mechanism for DPP4 inhibitors
  - Cannot use DPP4 inhibitor and GLP1 agonist together
  - Subcutaneous injection
  - Causes weight loss
- Sodium-glucose transport protein 2
  - Inhibits SGLT2 in the kidney
  - SGLT2 responsible for reabsorption of glucose by kidney
  - Common side effects especially among female patients are UTIs
- Which medications should we use?
  - Pharmacists weight many different factors to decide the best medication for a patient
  - Common things to consider
    - Weight, insurance, quality of life
- Role of the pharmacist in diabetes management
  - One of the primary conditions that a pharmacist can encounter/regulate
  - Growing need for pharmacists in acute care (hospital) and ambulatory care to work with patients with diabetes
- Acute care pharmacist
  - Work with physicians, nurses, PAs in hospital to make sure everyone in the hospital is being taken care of

- Community pharmacist
  - Responsible for dispensing medication to patient, make sure there are no drug interactions, make sure patient knows how to take medication, counsel patients on the phone
- Ambulatory care pharmacists
  - Work in clinics alongside other clinicians (hospitals); have prescriptive authority, can order lab tests, work with patient to help control their chronic condition
- Diabetes is one of the most common, chronic conditions in the US (public health problem)
  - Medications are primary treatment for diabetes
- 4 year pharmacy program at UH
  - 3 year didactics and IPPE and final year, you do your APPEs
  - Bachelor Arts in Pharmacy Studies (BAPS)
- Tracey Niimi from UH Hilo DKICP
- University of Hawaii at Hilo
  - Rural town, approximately 47,500
  - Diverse people
  - 3,372 enrollment
  - Hilo is a smaller town
  - New building: Hale Kiho'ihō'i
- DKICP PharmD certificates to differentiate yourself, illustrating that you specialized in something
- IPPEs 300 hours; APPEs 1440 hours
- Tuition cost around \$41,000 per year for non-residents
- Hilo is one of top 5 cheapest cities to live in in Hawaii; \$500-\$700
- Meetings ends at 7:03 PM