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Type 2 Diabetes (T2D)
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Introduction

- Type 2 diabetes (T2D) is long-term, chronic condition affecting the way the body processes glucose.
- More common than type 1 diabetes, T2D involves the body not producing enough insulin to metabolize food into energy (Leonitis & Hess-Fischl, 2019).
- Previously considered adult onset, evidence reveals increased prevalence of T2D in children, contributing to the growing number of 29.2 million people in the US with this disease (Cornell, 2013).
- A progressive disease, T2D predisposes individuals to heart disease, stroke, retinopathy, nephropathy, dementia, renal disease, and lower extremity amputation (Skyler et al., 2017).
- As disease progresses, pancreas is unable to keep up with demand, making T2D a progressive disease (Huether & McCance, 2019).
- Hyperglycemia, insulin resistance, and inflammation and eventual beta cell death (McCance et al., 2016, p. 24).

Case Presentation

- Working in a Case Management role, this graduate nurse experiences first-hand recurrent hospitalizations requiring patient education, utilization of resources and support to manage diabetes. C.P. is a 55-year-old male who most recently presented with A-Rh., neuropathy, open sores on both feet, and insulin or nephropathy. His blood glucose was 245 and was asked about home medications for diabetes patient exclaimed, “I don’t have diabetes, my blood sugar is just high.” Treatment of dysrhythmia, regulation of blood glucose, levels, treatment of open wounds required education therapies and milions.
- Obesity contributes to insulin resistance whereby serum levels of leptin, adiponectin and inflammation affect insulin synthesis and resistance (McCance & Huether, 2019).
- People with diabetes who smoke have increased risk of serious complications, such as heart disease, amputation, kidney disease, and poor blood flow in legs and feet predisposing them to infections and amputations.
- Collaborative education with a Diabetes Educator involved obtaining glucometer with education on use, storage of supplies, medication compliance, diet & lifestyle modifications as well as the importance of smoking cessation.
- Established patient with Chronic Care Management team for ongoing education, support and symptom management for overall health.

Underlying Pathophysiology

- Abnormalities of insulin signaling pathway with gradual progression.
- Pancreatic beta cell function ability to sense blood glucose level, insulin synthesis and secrete insulin.
- Insulin resistant to cells, thereby promoting gluconeogenesis from the blood.
- Cells in muscle, liver and adipose tissue ineffective at absorbing insulin, likewise cannot regulate glucose levels (Brunton, 2016, p.3).
- Inability of cells to respond to insulin leads to insulin resistance.
- Hormones in GI tract such as amylin and ghrelin are diminished in T2D, thereby slowing gastric emptying, GI motility and promoting hunger.
- Impaired regulation of hepatic glucose, the liver overproduces glucose due to developed resistance to suppressive effect of insulin.
- Insulin resistance develops with ectopic fat deposition in the liver and muscle.
- Accumulation of fat in the pancreas contributes to decline in beta cell function, beta cell inflammation and eventual beta cell death (Skyler et al., 2017, p.24).
- High levels of glycemia in blood signal pancreas to secrete more insulin. As disease progresses, pancreas become unable to keep-up with the demand which leads to insulin insufficiency and finally hyperglycemia (McCance & Huether, 2019, p. 690).

Conclusion

- Obesity
- Family history - 40% greater if one parent has the disease
- Age, older than 45 years
- Physical inactivity
- Hypertension
- Diet/diet during pregnancy
- Male sex - higher prevalence than females

Risk Factors

- Metabolic syndrome
- Smoking increases incidence by 30-40%
- Sleep quality/quantity
- Depression
- Psychosocial factors
- Ethnicity (Black, Pacific Islander, Asian American, or Native American)
- Low socioeconomic status

Signs & Symptoms

- Polydipsia
- Polyuria
- Polyphagia
- Hyperglycemia
- Fatigue
- Blurred vision
- Recurrent infections
- Poor wound healing
- Weight loss
- Areas darkened skin, usually in armpits and neck
- Possibly asymptomatic

Type 2 Diabetes (T2D): food digested in the bloodstream

https://www.kmenesondemand.com/Health/Bluemedia?id=4052552ContentType=pdf

Implications for Nursing Care

- Patient and family education regarding disease process, signs and symptoms of hyperglycemia and prevention of T2D complications.
- Referral to resource for a Nutritional management for balanced and healthy diet promotes glycemic control and overall health.
- Personalized approach for a regular exercise regimen thereby encouraging weight loss.
- Referral to resource for a Risk factors of T2D along with dietary management may lead to hypoglycemia as blood glucose levels regulate.

Significance of Underlying Pathophysiology

- Chronic hyperglycemia leads to CAD, PAD, CVD (Brunton, 2016).
- Blood vessels damaged by constant hyperglycemia lead to thickening and stiffening in the kidneys and eyes, likewise diabetic nephropathy develops when blood vessels in the kidneys undergo damage.
- Peripheral neuropathy is loss of sensation in hands and more commonly feet from chronic nerve damage which leads to undetected sores predisposing individuals to infections.
- Neuropathic damage occurs in the kidneys and liver. Further damage to kidneys, liver eventually lead to renal, hepatic failure.
- Diabetes care in the last 20 years, the number of adults diagnosed with diabetes has more than tripled as the US population has aged and become more overweight. (Type 2 Diabetes Data & Statistics, 2019).
- Diabetes care has a major economic impact worldwide, as a future major nursing practitioner (PNP) patient education on T2D risk factors, disease process and medical management are vital to halt this growing epidemic.
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