

Week 6 Case Study Template

Pathophysiology & Clinical Findings of the Disease

1. Based on the review of the history, physical, and lab findings what is the most likely diabetes diagnosis for this patient?

Based on the patient's history, physical examination, and lab results, it is highly likely that the patient has Type 2 diabetes. The American Diabetes Association (ADA) states that diabetes is diagnosed if the A1C level is above 6.5%, Fasting Plasma Glucose (FPG) is 126 mg/dl or higher, or the Oral Glucose Tolerance Test (OGTT) shows a result greater than 200 mg/dl. In this case, the patient's A1C is 7.2%, FPG is 132 mg/dl, and OGTT is 220 mg/dl, confirming a diagnosis of diabetes.

Type 1 diabetes is an autoimmune disease where the immune system attacks and destroys the insulin-producing beta cells in the pancreas, leading to an absolute insulin deficiency (ADA, 2022). This condition typically begins in puberty or early adulthood, usually before the age of 35. Key indicators of Type 1 diabetes include diagnosis at a young age (under 35), a lower body mass index (BMI) under 25, unintentional weight loss, the development of ketoacidosis, and glucose levels over 360 mg/dl at diagnosis (ADA, 2022).

On the other hand, Type 2 diabetes is characterized by a progressive decline in B-cell insulin secretion, often due to insulin resistance and metabolic syndrome, and is not caused by an autoimmune process (ADA, 2022). It is more common in adults over 40 and is typically associated with obesity, defined as a BMI of 25 or higher (ADA, 2022). In this case, the patient is 48 years old with a medical history of hypertension (HTN) and hyperlipidemia (HLD) and has a BMI of 36.5, classifying him as obese. Obesity, HTN, and HLD are major risk factors for Type 2 diabetes (ADA, 2022). Additionally, the patient has a family history of Type 2 diabetes, as his brother also has the condition, which further increases his risk.

2. Explain the pathophysiology associated with the chosen diabetes diagnosis.

Type 2 Diabetes Mellitus (T2DM) primarily arises from two main factors: impaired insulin secretion by pancreatic β -cells and insulin resistance (Galicía-García et al., 2020). β -cells play a crucial role in producing insulin. Dysfunction of these cells occurs in conditions such as obesity, hyperglycemia, and hyperlipidemia. In these states, β -cells face various harmful factors like inflammation, ER stress, oxidative stress, and amyloid stress, which can ultimately lead to the deterioration of pancreatic islet function (Galicía-García et al., 2020).

Insulin resistance occurs when insulin-sensitive tissues fail to respond effectively to insulin, commonly seen in obesity. In obesity, adipose tissue triggers inflammatory processes, releases excess free fatty acids (FFAs), and disrupts adipokine regulation (Galicía-García et al., 2020). This disrupts insulin's ability to promote glucose uptake in muscle, liver, and adipose tissue, while also stimulating glucose production in the liver (Galicía-García et al., 2020). When both β -cell dysfunction and insulin resistance are present, hyperglycemia worsens, contributing to the progression of Type 2 diabetes.