

Diabetes mellitus essay sample



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Diabetes Mellitus is a disease caused by abnormal insulin production, impaired insulin utilization or both. Diabetes Mellitus is a severe health problem that affects people all over the world. It affects 8.3% of the U. S. population, and it is the 7th leading cause of death in the United States (Huether & McCance, 2012). The first time it was discovered by the ancient Egyptians it was around 1500 B. C. It was considered a rare condition at that time, where a person lost a lot of weight and urinated excessively. The term “diabetes mellitus” comes from the Greek word diabetes meaning siphon – to pass through and the Latin word mellitus meaning honeyed or sweet. (Polonsky, 2012). This is because in diabetes excess sugar is found in the blood as well as in the urine. In the middle ages, it was named the “pissing evil” (Polonsky, 2012).

Until the 1800s, nothing was known about the mechanisms responsible for the disease, no treatment was available, and diabetes was fatal within weeks to months after its diagnosis due to insulin deficiency. In our days, although there has been made significant signs of progress in the treatment of this disease, diabetes is still associated with a reduced life expectancy, and there is no cure available. The primary approach for diabetes lays in its prevention and treatment. Today there are many effective therapies for treating hyperglycemia and its complications. Still, diabetes is one of the most common and most serious medical conditions that healthcare has to deal with. Proper education and prevention teaching are the only ways to prevent this disease.

There are three types of diabetes:

- type 1 diabetes mellitus
- type 2 diabetes mellitus
- gestational diabetes

Type 1 diabetes mellitus is the most common pediatric disease and affects 0.17% of U. S. children (Huether & McCance, 2012). With this type, the body doesn't produce insulin. The underlying pathophysiologic defect in type 1 diabetes is the autoimmune destruction of pancreatic Beta cells. This results in an absolute insulin deficiency, and the pancreas no longer produces insulin. The thoughts behind the autoimmune beta cell destruction are that it is triggered by an environmental event, such as a viral infection (Huether & McCance, 2012).

The onset of type 1 diabetes is usually immediate. It generally occurs before the age of 30 years but may be diagnosed at any age. Most type 1 diabetic individuals are of average weight or are thin in stature. Since the pancreas no longer produces insulin, a type 1 diabetes patient is dependent on administered insulin for survival. According to Huether and McCance, people with type 1 diabetes are highly susceptible to diabetic ketoacidosis (Huether & McCance (2012). Due to the pancreas not producing insulin, glucose has a difficult time entering cells and remaining in the bloodstream. To meet these cellular energy needs, fat is broken down through lipolysis, releasing glycerol and free fatty acids. Glycerol is converted to glucose for mobile use, and fatty acids are converted to ketones, resulting in increased ketone levels in body fluids and decreased hydrogen ion concentration (pH) (Huether & McCance (2012). Ketones are excreted in the urine, accompanied by copious amounts of water. The accumulation of ketones in body fluids, decreased pH,

electrolyte loss and dehydration from excessive urination, and alterations in the bicarbonate buffer system result in diabetic ketoacidosis (DKA) (Dods, 2013). Left untreated DKA can result in coma or death. Many patients with type 1 diabetes are initially diagnosed with the disease following hospital admission for DKA. In a known diabetic patient, periods of stress or infection may precipitate DKA. More often, however, DKA results from poor daily glycemic control. Patients who remain severely hyperglycemic for several days or longer due to inadequate insulin administration or excessive glucose intake are prone to developing DKA. (Dods, 2013).

Diagnosis of diabetes type 1 is made by checking the glycated hemoglobin (A1C) (Dods, 2013). This blood test indicates the average blood sugar level for the past two to three months.

It measures the percentage of blood sugar attached to the oxygen-carrying protein in red blood cells (hemoglobin). Some symptoms in diagnosing the type 1 diabetes are polydipsia, polyuria, polyphagia, weight loss, and hyperglycemia (Dods, 2013).

Treatment for type 1 diabetes includes: taking insulin; carbohydrate, fat and protein counting; frequent blood sugar monitoring; eating healthy foods; exercising regularly and maintaining a healthy weight.

The goal is to keep the blood sugar level as close to normal as possible to delay or prevent complications. Generally, the goal is to keep the blood sugar levels before meals between 80 and 130 mg/dL (4.44 to 7.2 mmol/L) and after-meals keep the blood sugar no higher than 180 mg/dL (10 mmol/L) two hours after eating (Huether & McCance, 2012).

Type 2 diabetes is the most common and prevalent type of diabetes. Usually, it occurs in people over 40 years old. The most common risk factors are age, obesity, hypertension, physical inactivity, and family history. (Huether & McCance 2012).

In type 2 diabetes, the body either produces insufficient amounts of insulin to meet the demands of the body or insulin resistance has occurred. Insulin resistance is referred to when cells of the body such as the muscle, liver and fat cells fail to respond to insulin (Dods, 2013). According to Dods the pathophysiology of diabetes type 2 includes: peripheral resistance to insulin, increased production of glucose by the liver and by altered pancreatic insulin secretion (Dods, 2013). Dods explains that the increased tissue resistance to insulin happens first which is followed by impaired insulin secretion (Dods, 2013). At this time the pancreas continues to Produce insulin, but insulin resistance prevents its use at the cellular level. Glucose cannot enter the target cells but coagulates in the bloodstream, resulting in hyperglycemia. The high blood glucose levels often stimulate an increase in insulin production by the pancreas producing in excessive insulin production (hyperinsulinemia) for the type 2 diabetic individuals. (Dods, 2013).

Insulin resistance is significantly associated with obesity and lack of physical activity. As a treatment, weight loss is most important for obese type 2 diabetic patients. Thus, insulin resistance is associated with weight loss (Kim & Reaven, 2010).

Type 2 diabetes usually has slow inception and may remain undiagnosed or dormant for years. Approximately half of those who have type 2 diabetes are

unaware of their disease (Piper, Stewart, Murphy, 2017). By the time many type 2 diabetic patients are diagnosed, diabetic complications have already begun. Type 2 diabetic patients can still produce insulin and do not require exogenous insulin for survival (Kim & Reaven, 2010). Insulin injection is the medical management for type 2 diabetes. Unlike type 1 diabetic patients, individuals with type 2 diabetes are generally resistant to DKA because their pancreatic insulin production is often sufficient to prevent ketone formation (Piper, Stewart, Murphy, 2017).

Several tests may be utilized for diagnosing diabetes type 2: glycated hemoglobin test, fasting plasma glucose, oral glucose tolerance test (Piper, Stewart, Murphy, 2017). Type 2 diabetes is treated through diet, exercise, and medication. The goal of treatment is to keep blood sugar under control and prevent diabetes complications. Left untreated, type 2 diabetes can damage the heart, blood vessels, nerves, kidneys, brain, eyes, feet, and skin. It increases the risk of heart attack and stroke, it can lead to kidney failure, and it can lead to vision loss (Piper, Stewart, Murphy, 2017). In some severe cases, people with type 2 diabetes need a foot or a leg Amputated. The risk of these and other complications is why it is so vital to the blood sugar under control can prevent these complications.

Gestational diabetes occurs during pregnancy. Hormones from the placenta help the baby develop, but at the same time, these hormones may block the action of the mother's insulin in her body, causing insulin resistance. About 5 to 10 percent of all pregnant women get gestational diabetes (Piper, Stewart, Murphy, 2017). At higher risk are women who are: 25 or older, overweight; or have a close relative with diabetes, have the polycystic ovarian syndrome,

have a medical condition such as glucose intolerance, have had gestational diabetes before, or have had a big baby before. Eating a balanced diet and getting regular exercise can reduce the chances of getting gestational diabetes. (Piper, Stewart, Murphy, 2017).

The interview I conducted on my patient regarding diabetes mellitus had many common points with the research I did on this topic. My patient had no family history of diabetes, but she was diagnosed with gestational diabetes while she was pregnant. She gained 60 pounds during the pregnancy. My patient did not go for follow-ups to check her blood sugar after the pregnancy, and five years after she had her baby she was diagnosed with diabetes type 2. She did not have any symptoms; she was diagnosed during routine blood work.

According to Huether & McCance, many women with diabetes type 2, was diagnosed with gestational diabetes (Huether & McCance, 2012). Women with gestational diabetes have a 35% to 60% chance of developing DM in the next 10-20 years (Huether & McCance, 2012). At this time, my patient is not too motivated to adhere to a healthy diet or to include exercise in her daily schedule. I hope that through proper education, and by following the directions from her doctor, she will be able to Avoid the many complications that are associated with diabetes. By making significant changes in her lifestyle, she will not only improve her outcome, but she will also prevent her child from developing diabetes.

Based on the literature that I reviewed and the interview I conducted on my patient, I concluded that gestational diabetes leads indeed to type 2

diabetes if the patient is not educated on the prevention of this disease.

Patients with gestational diabetes need to be monitored closely following the birth of their baby; they need to know and recognize the symptoms that lead to diabetes. Prevention plays a key factor for this disease, as diabetes type 2 can be prevented with exercise and a healthy diet. Supported by research (Huether & McCance, 2012; Piper, Stewart, Murphy, 2017: and Dods, 2013), diabetes mellitus cannot be cured, but with the medical technological advances, we can assist our patients how to manage this disease better.