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INTRODUCTION

Diabetes mellitus is a disease increasingly affecting many people around the world. It affects more than 120 million people worldwide, and is estimated that it will affect 370 million by the year 2030 (Kumar and Clark 2009). Zambia experiences a lot of cases of diabetes mellitus however; the diabetes prevalence of Zambia is 5.13 % of population ages ranging from 20 to 79 and with a global ranking of 153. Diabetes mellitus prevalence rate compared to other countries is similar to Norway (Mecometer 2013).

A recent report on non communicable diseases states that, “developing countries are undergoing an epidemiological transition from the communicable and infectious diseases to the non communicable diseases” (WHO, 2011).

In the essay I will look at diabetes mellitus type two, the challenges patients go through and focusing on the patient’s perspective. As a nurse having worked in Zambia and in Norway, I will look at the settings of Zambia and the implications of the challenges in nursing .I will build on the information from research, journals, ,textbooks and internet sources and where I am not able to find information I will use my own experience and knowledge.

DEFINITION

Diabetes mellitus refers to a chronic, progressive disease characterized by the body’s inability to metabolize carbohydrates, fats and proteins leading to hyperglycemia. Hyperglycemia is the high blood glucose levels in the body. However, diabetes is sometimes referred to as “high sugar” by health care providers and client’s .The phrase is appropriate because of the passage of large amounts of sugar in urine characteristic of poorly controlled diabetes (Black and Hawk 2009).

Classification

Diabetes mellitus is classified as type one and type two. Type one previously known as insulin dependent diabetes mellitus or juvenile onset diabetes mellitus, is the result of auto immune beta -cell destruction leading to absolute insulin deficiency. It is usually diagnosed before the age of 30.

Type two diabetes mellitus previously known as non insulin dependent or adult onset diabetes mellitus occurs as a result of progressive insulin secretory along with insulin resistance. It usually affects older adults above the age of forty and those who are obese (Black and Hawks 2009).

Risk factors

The risk factors patients are faced with are family history, this plays a part in the development of diabetes type two where many family members have obesity, and this factor may contribute to the disease.

Diabetes mellitus increases in developing countries especially Zambia due to urbanization and industrialization. When people move there is change in the lifestyle from traditional to modern with unhealthy eating diets, hence obesity and inactivity which will contribute to the diabetes (Hjelm et al., 2003).

Emotional and psychological stress cause elevation of the stress and growth hormones leading to increased blood glucose levels in the body which results in increased demand on insulin production by the pancreas. Drugs like diuretics for example hydrochlorothiazide, adrenocorticosteroids and oral contraceptives when they are taken for a long period of time they interfere production of insulin hence one developing diabetes mellitus (McCann, 2001). Age especially people above the age of forty have a high prevalence to have impaired glucose levels. Physical inactivity increases type two diabetes in that it lowers the metabolism of food in the body (Senkwe et al., 2011).

PATHOPHYSIOLOGY

A limited beta cell response to hyperglycemia appears to be a major factor in its development. Beta cells chronically exposed to high blood levels of glucose become progressively less efficient, when responding to further glucose elevations. This phenomenon is termed as desensitization and it is reversible by normalizing glucose levels. The ratio of pro insulin a precursor to insulin also increases (Black and Hawks 2009).

A second pathogenesis in type 2 diabetes mellitus is the resistance to the biologic activity of insulin in both the liver and the peripheral tissues. This state is known as insulin resistance. People with type 2 diabetes have a decreased sensitivity to glucose levels which results in continued hepatic glucose production, even with high blood glucose levels. This is coupled with an inability of muscle and fat tissues to increase glucose uptake. The mechanism causing peripheral insulin resistance is not clear, however it appears to occur after insulin binds to a receptor on the surface cell. Insulin is a building hormone without insulin problems occur such as decreased glucose utilization, increased fat metabolism and increased protein utilization (Black and Hawks, 2009).

Clinical manifestations

In diabetes the onset of clinical manifestations may develop gradually, Patients may notice few clinical manifestations. The patients will experience an increase in frequency of urination known as polyuria. This occurs as a result of water not being reabsorbed from the renal tubules, secondary to osmotic activity of glucose leading to loss of water, glucose and electrolytes. Patients experience a dry mouth due to the reduced fluid and electrolytes in the body. Thereafter, an increase in thirst and fluid intake known as polydipsia.

As the disease progresses, weight is lost despite the patient experiencing hunger and increased food intake known polyphagia. This is due to lack of fluid in the body, increased breakdown of fat and muscle secondary to lack of insulin in the body. In addition, a patient may experience shivering and sweating when they are hungry.

Weakness fatigue and dizziness occurs in patients with diabetes mellitus due to decreased plasma volume leading to postural hypotension, potassium loss and protein catabolism.

Recurrent blurred vision secondary to chronic exposure of the ocular lens and the retina to hyperosmolar fluid (McCann 2001, Kumar and Clark 2009).

Management

Physical examinations ,medical history,and laboratory tests are employed in health centers to evaluate patients with diabetes mellitus type 2 .Clinical manifestations suggest the presence of diabetes melitus but, laboratory tests are needed to make a diagnosis . The fasting blood glucose level sample is drawn from the patient. The patient must not eat anything apart from water for at least eight hours. The sample of blood is then tested. A diagnosis of diabetes is made when a patient's blood glucose level is greater than 126mg/dL. The fasting blood glucose measurements provides the best indication of overall glucose, it is the preferred method of diagnosing diabetes mellitus. Patients can be diagnosed using a random blood glucose level. When the results are greater than 200mg/dl it is an indication of diabetes. The other test is known as the Post load blood glucose level meaning, after a meal. This sample is taken two hours after a standard meal, a result of greater than 200mg/dl is a confirmation of diabetes (Black and hawks, 2009).

In a case where there is no laboratory, a glucometer is used to detect the blood sugar levels instantly. On the other hand, a urine sample is collected from a patient urinalysis test is done, which may reveal a raised glucose in the urine (WHO, 1999).

Types of insulin

Insulin is made chemically by deoxyribonucleic acid (DNA) technology meaning human

insulin. It is made with different durations of action rapid, short, intermediate, and long acting. The human insulin peaks more precise and predictable. It has a shorter duration of action with a reduced ability to produce antigen response. It does not cause loss of subcutaneous fat or fat metabolism disturbance, leading to loss of subcutaneous fat at the site of the injection. Insulin works to lower blood glucose levels. It does this by promoting the transport of glucose into the cells, inhibiting the conversion of the glycogen and amino acids to glucose. Thereafter, patients who have been prescribed are given two types of insulin these are the rapid acting and the long acting (Black and Hawk 2009).

The rapid acting insulin Humalog and NovSalog, are the foundation in the management of clients with diabetes. They are similar to human insulin .However the onset for the rapid acting insulin begins to work about five minutes after injecting the patient,peaking in one hour and a duration of action lasting about two to four hours .They are both used subcutaneous or in the insulin pump and should be taken immediately before eating. They both provide benefits in achieving glucose control and may ultimately prevent or delay complications. Insulin therapy is individualized and the dosage varies greatly because of

The effects of various types of insulin with a starting dose of 0.5unit/kg/day but may increase according to the health care provider (Black and Hawks 2009).

Challenges

Recent research study on diabetes mellitus conducted in 2011 in Sub-Saharan Africa , has shown that diabetes mellitus type 2 accounts for over 90 percent of diabetes mellitus patients. The disease is a significant burden in the region and is expected to increase. The total annual cost of diabetes mellitus in the Sub Saharan region was estimated at 67.03billion US dollars or 8836 US dollars per diabetic patient (Diabetes for sub-Saharan,2011).Now I will discuss the challenges the patients are facing in the Zambian setting.

Infrastructure and diagnostic tools

Zambia is a developing country, it experiences a lot of challenges in the acquiring of the needed tools in the management of diabetes. This problem is experienced due to limited funding. The glucose and ketone testing equipment are unavailable at most of the health institutions and this makes it difficult to monitor the patients on how they are responding to the treatment they are receiving, and determine the severity of the disease. Along the way this may lead to miss management of the disease and in some cases the diabetes may not be

detected in time .On the other hand most patients have no means of self monitoring of blood glucose level, only the wealthy manage to purchase a glucometer from the private sector. This leaves the less privileged without access to one. The patients from the rural areas of Zambia are most affected as the distance from the hospital where equipment is and where the private pharmacies are located is vast (Beran et al., 2005).

Insulin is an essential drug, in the treatment of diabetes mellitus apart from oral diabetic drugs in the Zambian community. Patients receiving insulin are given for free by the government owned institutions in Zambia and at times insulin is out of stock. The insulin is purchased from the private sector, using internal tenders from the private wholesalers at a very high price. The distance and the cost involved to access the drugs from the hospital by most patients is a barrier leading to poor prognosis (Beran et al., 2005).

The majority of the syringes that are used for the administration of the insulin are purchased from the private sector, hence making patients on insulin, living in the rural areas having difficulties in accessing the syringes. Special syringes are widely used form of administering insulin in Zambia. Syringes are in short supply in the public health sector and most patients reuse their syringes more than once, until the injection becomes blunt.

As a nurse from Zambia having worked in one of the hospitals In Norway, I came across the use of insulin pens and insulin pumps which are not used in the hospitals in Zambia. The insulin pump is used for

Continuous administration of regular insulin. The small pump, is worn externally, it injects insulin subcutaneously into the abdomen through an indwelling needle site changed one to three days. Insulin is usually infused at a low rate, a rate that matches the patients, basic metabolic needs with additional infusion of larger amounts of insulin just before the meals. Insulin pump commonly improves the glucose control by means of continuous subcutaneous insulin infusion. However, the pump does not have a built in feed back mechanism for monitoring the blood glucose levels. To benefit from the use of an insulin pump the patient must comply with the diet requirements and must deliver the correct bolus of insulin before a meal. The Patient must also monitor the blood glucose levels four times a day and make the doses using the problem solving skills (Black and Hawk 2009).

In addition insulin pens are used for multiple injections; another insulin delivery method .The pen-like holder is loaded with pre-filled cartridges holding 150 to 300 units of insulin. A disposable needle is then attached to the pen for each injection, but they do not carry extra syringes or bottles of insulin. The insulin dose is entered into the pen before administering it. Each new needle is attached before the the desired insulin dose is entered into the pen for

administration (Black and Hawk 2009).

The health system In Zambia is public, as there is no health insurance. The government is the main provider of the health service to all users making it free. However, health services are under funded and frequently drugs are unavailable forcing patients to purchase from private pharmacies. The major reason for the non accessibility of insulin in all the regions of the country is transportation difficulties, high demand and lack of supply. Most of the hospital lacks guidelines on management of diabetes mellitus nation wide, contributing to the setbacks in dealing with the diabetic disease (Mario and Sridevi alla 2008).

Knowledge

Misconceptions about the diet and a low understanding of insulin use leads to poor management and frequent complications. These misconceptions in the communities in Zambia occur due to the low education, low social economic status and poverty among the patients.

Many health workers rarely get cases of diabetes mellitus requiring insulin especially the remote areas of the country and lack of guidelines on diabetes that is, the management and prevention may lead to poor understanding of a patient's condition and miss the diagnosis (Beran et al. 2008).

In Zambia and sub Saharan Africa at large the major threat lies in patients, which relying on traditional medicine than the modern one. The problem with the traditional healers is that they rarely refer the patients to public health facilities, because of their little understanding of the disease even though they may be aware of the patient's complaints like excessive thirst and frequent urination hence causing a delay

In diagnosing disease (Hjelm K and Nambozi, 2008).

Storage

Zambia experiences a climate which is warm most part of the year and from my experience of nursing Patients on insulin, the storage system it is a big challenge. Many households especially in the rural areas do not have refrigerators to keep the insulin cool, for the patients on the self administering of insulin. This leads to poor prognosis as these patients tend to use insulin that is not properly stored and less potent.

Diet

To establish a suitable diet for a diabetic patient is a problem in Zambia, due to the cost of living and the availability of food according to the seasons. Having meals is a challenge, as most people have one meal a day others two meals. The staple food being nshima has a high

Content of carbohydrates and may contribute to the raising blood sugar levels after meal. A diet modification after being diagnosed with diabetes is equally a challenge.

Patient education

Education of the patient about Diabetes is the way for successful diabetes .It focuses on explaining the key concepts of diabetes, especially the chronic nature of the disease and therefore the inevitability of treatment for life, and on understanding its interactions within the social context, which is vital to effectively fighting the disease. It will also help explain the management of diet and physical activity, and warn of the risks of complications. Education benefits both the patient and the nurse, so that the various stages of treatment are understood and effectively applied (Senkwe et al., 2011).

Complications

Patients living with diabetes are at an increased risk of developing complications, causing deaths and chronic illnesses affecting all the body system. Diabetes is usually irreversible, although a patient can have a reasonably normal lifestyle, its late complications result in reduced life expectancy.

Diabetic retinopathy occurs where the lesions develop in the retina and in the iris, associated with macula edema and consequent loss of vision (Kumar and Clark 2009).Diabetic foot occurs due to infection, ischemia and neuropathy producing tissue necrosis associated with trauma and infection of the lower extremity which results in amputation (Kumar and Clark 2009).

Hypoglycemia occurs when the blood glucose level fall below a certain thresh hold of 80mg dl and It may occur following an insulin injection that does not correspond to food intake,or an overdose (Wild et al., 2004).Diabetic ketoacidosis occurs when the body can no longer use sugar as fuel because of the total absence of insulin Kidney disease in the body.

Infections on the skin such as boils and abscesses are due to impaired leukocyte function and vascular insufficiency infected sites are due to damaged vascular system that cannot carry sufficient white blood cells, oxygen, nutrients and anti bodies to the injured site.

Urinary tract infections particularly in women occur due to the inhibition of the leukocyte activity while glucose in urine is associated with hyperglycemia. The development of glucose in urine results incomplete emptying of the bladder causing urinary retention which may

contribute to the risk of urinary tract infections.

Hyperglycemia impairs the patients resistance to infection because the glucose content of the epidermis and the urine encourages bacterial growth thereafter a patient is susceptible to skin and urinary tract infections and vaginitis (McCann, 2001).

One of the most common complications in diabetes mellitus is neuropathy. The nerve fibers are affected, causing numbness and loss of sensation especially in the legs and feet. Neuropathy is associated with poor blood circulation in the legs contribute to the development of ulcers on the feet. If the ulcers on the feet are not treated properly, patients run the risk of gangrene and lower limb amputation. Diabetes contributes to impotence in men (Azevedo and Alla, 2008).

Coronary heart disease is caused by the coronary artery changes that influence decreased oxygen and nutrients to the myocardium. Diabetes mellitus also affects the large blood vessels thereby affecting the heart, brain and the lower limbs. When the large veins are affected

CONCLUSION

In conclusion, diabetes mellitus still remains a challenge in Zambia. Therefore the Zambian health system needs to put more efforts with other stake holders in order for the challenges being faced by the patients living with diabetes mellitus type two to be overcome. The challenges of shortage of staff, the unavailability of equipment, equal distribution of the tools and the purchase of syringes and insulin in good time . These areas include hospitals healthcare centers and the community at large.

RECOMENDATIONS

To increase consultation time for patient during hospital visits to allow time for education.

More healthcare workers to be employed in the hospitals to improve on the health care delivery.

Increasing the number of staff trained in diabetes for continuous education and knowledge.

The leaders at the health institutions need to put in place a good referral system and ensure the guidelines are up to date and are used to improve on the quality of care to diabetes mellitus patients.

People in the communities must be educated on diabetes for awareness.

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