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Prevention of diabetic complications among the elderly

Thesis

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ABSTRACT

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<p>In Finland, the morbidity of diabetic mellitus is high. According to the record data, the Finnish people has the highest risk to have diabetic mellitus. When the patient has long disease history of diabetics, they will have high risk to occur in the diabetic complication, especially the elderly patient with diabetics.</p> <p>The purpose of this thesis is to study the current situation regarding diabetic complications among elderly. The thesis studies two different complications: diabetic foot and diabetic nephropathy. It would also answer basic questions regarding to elderly diabetic complications. The aim of this thesis is to create awareness among nurses who takes care of elderly diabetic patient. Additionally, it would be used as a guide to patient and their family numbers.</p> <p>The study showed that diabetes mellitus complications are famous but many people have wrong information about this disease. In a word, these serious complications could be prevented by patient themselves both with and without the help from nurses.</p>		

Key words

Diabetic complication. Prevention. Elderly. Diabetic foot. Diabetic nephropathy

ABBREVIATIONS

GLU	Blood glucose
HL	Hyperlipidemia
DM	Diabetic Mellitus
GFR	Glomerular Filtration Rate
HTN	Hypertension

CONTENTS

ABSTRACT

LIST OF ABBREVIATIONS

CONTENTS

1 INTRODUCTION.....	5
2 THEORETICAL FRAMKWORK	6
2.1 Cause and definition of diabetic mellitus.....	6
2.1.1 Type 1 DM Definition and Cause.....	6
2.1.2 Type 2 DM Definition and Cause.....	7
2.2 Diabetic foot and prevention.....	9
2.2.1 Diabetic foot.....	9
2.2.2 Prevention of Diabetic foot.....	10
2.3 Diabetic nephropathy and prevention	11
2.3.1 Diabetic nephropathy.....	11
2.3.2 Prevention of diabetic nephropathy.....	12
2.4 Nursing care of the elderly with DM.....	12
2.5 Patient counselling.....	13
3 RESEARCH PURPOSE, OBJECTIVE, AND QUESTIONS.....	14
4 METHODOLOGY AND DATA.....	15
4.1 Literature Review.....	15
4.2 Data collection.....	16
4.3 Data analysis.....	17
5 RESULTS.....	18
5.1 Prevention of diabetic foot.....	18
5.2 Prevention of diabetic nephropathy.....	20
5.3 What Patient can do for themselves.....	22
5.3.1 Food.....	22
5.3.2 Drink.....	22
6 DISCUSSION.....	24
7 REFERENCE.....	26
8 Table 1: Articles summary	28

1 INTRODUCTION

In Finland, there have 350,000 people has been diagnosed with diabetes, and the number of the type 2 diabetes accounts for two-thirds. The have accorded data to show the Finnish people are placed on the top of the risk occur in the diabetic mellitus. The have different factor to cause the diabetic mellitus, like a genetic factor, environment, lifestyle, and so on. But when people have had the diabetic, they cannot completely to heal, because the modern medical technology and equipment are not enough to completely make the patient with diabetic to be recovered. So the nurse can teach the patient how to avoid the diabetic complication. When the patient has lung disease history of diabetic, they will have a high risk to occur in the diabetic complication, especially the elderly patient with diabetic. They have been long since diabetic cause the diabetic complication. (Finnish Diabetes Association 2017.)

The diabetic mellitus has two different type, called type 1 diabetes and type 2 diabetes. Type 1 diabetes for almost occur in child and teenager, because the patient has autoimmune deficiency and genetic factors. And the type 2 diabetes almost occurs in adults and elder. This type has many factors in effect to diabetes, like: life style, body secretion insulin problem and environment factor. Diabetic complications individual two parts: the short term and the long term complication. The short term complication occurs by blood glucose level. If the blood glucose goes too low or too high for the body function properly in the present status. Short term complications can present immediate danger and need to be treated quickly to avoid emergencies. Most of the diabetic short term complication have hypoglycemia and ketoacidosis. (Forssas, Arffman, Koskinen, Reuanen & Keskimaki 2010.)

The purpose of this thesis is to study the current situation regarding diabetic complications among the elderly. The thesis studies two different complications: diabetic foot and diabetic nephropathy. It will create awareness among nurses who take care of the elderly diabetic patient. Additionally, it would serve as a guide to patient and their family numbers.

2 THEORETICAL FRAMEWORK

2.1 Cause and definition of Diabetic Mellitus

Diabetic mellitus is a metabolic disorder which characterized by high blood sugar. High blood sugar is caused by lack of insulin activity and glucagon inappropriately elevate blood sugar. It leads to chronic impairment and dysfunction of the eye, kidney, heart, blood vessel, nervous. Patients may have extreme thirst, urine, obvious, dehydration, extreme fatigue, nausea or vomiting, poor appetite, large vascular lesions, small vascular lesions, neuropathy and other symptoms. (Heller 2009.)

2.1.1 Type 1 DM Definition and Cause

There are two main factors to the causes of diabetes: genetic factors and environmental factors. Diabetes is a genetic factor and environmental factors long-term interaction results. Which genetic factors are internal factors, is the basis of the disease. Environmental factors are external factors, the conditions of the disease, external factors through internal factors to play a role(Heller 2009.)

Type 1 diabetes is an autoimmune disease that causes the insulin producing beta cells in the pancreas to be destroyed, preventing the body from being able to produce enough insulin to adequately regulate blood glucose levels. Type 1 diabetes may sometimes be referred to as juvenile diabetes, however, this term is generally regarded as outdated as, whilst it is commonly diagnosed in children, the condition can develop at any age. Insulin dependent diabetes is another term that may sometimes be used to describe type 1 diabetes. Because type 1 diabetes causes the loss of insulin production, it therefore requires regular insulin administration either by injection or by insulin pump. (Heller 2009.)

Type 1 diabetes is caused by a fault in the body's immune response in which the immune system the wrong targets kills beta cells, the cells in the pancreas responsible for producing insulin. As more insulin producing cells in the pancreas are killed off. The body cannot to longer control the blood glucose levels and the symptoms of diabetes begin to appear. The factors that lead to the initial defects in the immune system remain to be seen. However, research suggests that the condition results from a combination of genetic predisposition with an environmental trigger. To date, the strongest evidence points towards a virus as being the most likely trigger. (Heller 2009)

2.1.2 Type 2 DM Definition and Cause

Type 2 diabetes is caused by hyperglycemia metabolic diseases; it can't produce enough insulin resistance to hyperglycemia in the body. Type 2 diabetes diseases of characterized are the body cannot metabolize glucose. It can lead in high levels of blood and sugar in the body that can damage the body organs over time. For the patient with diabetes, normal food will become a poison of disorder the metabolic. But many patients with type 2 diabetes want to keep well and have to be a better situation. If they can keep the blood sugar lower, then they need to avoid eating sugar. Maybe they do not require long-term medication. Type 2 diabetes mainly occurs in people over the age of 40 years. However, type 2 diabetes is now more common in adolescents and children about 90% of global diabetes. (Takuo, Tomoyasu, Masayoshi & Yukio 2017)

Type 2 diabetes is a complex to completely healing clinical disease. The medical condition that usually uses of antidiabetic drugs or insulin to control blood sugar levels. However, the early detection and treatment can prevent type 2 diabetic to development and complications. Recently, many patients with type 2 diabetes can be through the low-carbon diet or low-calorie diet and exercise methods to change the diabetes disease development. According to the healthy diet method, it can improve blood glucose levels and weight, and use insulin resistance to hyperglycemia. The diabetes mellitus can be prevented by diet and exercise before the early stages of diabetes or metabolic disorders. (Hess 2004.)

The type 2 diabetic which caused by the body cannot produce the insulin independent. Type 2 diabetes occurs when the hormone insulin is not used effectively by the cells in the body. Insulin is needed for cells to be taken in glucose from the blood stream and convert it into energy. Ineffective use of insulin results in the body becoming resistant to insulin - also known as insulin resistance, which in turn causes blood sugar levels to rise (hyperglycemia). In advanced stages, type 2 diabetes may cause damage to insulin producing cells in the pancreas, leading to insufficient insulin production for the body needs. (Hess 2004.)

Type 2 diabetes carries the risk of diabetes complications over time. The most common complications of type 2 diabetes include: heart disease, stroke, kidney disease (nephropathy), eye disease (retinopathy) and nerve damage (neuropathy), which raises the risk of amputation. In fact,

about 50% of patients with type 2 diabetes develop early signs of these health conditions when they are diagnosed. Which also includes depression and sexual dysfunction, but their risks can be reduced through good treatment control and attending all diabetic screening appointments. As with many chronic diseases, early diagnosis is better way to make the treatment plan for the type 2 diabetes patients. Before of the type 2 diabetic developments, most patients have the pre-diabetic symptoms. The diabetic can be preventable at this stage. In the short term complications of diabetes, ketoacidosis is rare amongst type 2 diabetics. However, the non-ketogenic hyperglycemia still has the big threaten to type 2 diabetics patient, it should to be careful(Hess 2004)

2.2 Diabetic foot and prevention

2.2.1 Diabetic foot

Foot care amongst diabetics is incredibly important as foot related complications are common for those of us with diabetes. Foot ulcers affect as many as 1 out of 10 people with diabetes it can be too easily develop from blisters and small wounds to amputation. Even small ulcers on the foot can represent a serious risk. They may heal extremely slowly and need rigorous treatment to cure. Ulcers can develop into serious lower body infections, with the possibility of amputation at an advanced stage. (Ivy, Lemos & Thomas 2008.)

The presence of high blood glucose levels over a long period of time may result in a condition called diabetic neuropathy (damage to the nerves) or loss of circulation in the extremities of the body. If the nerves in feet or legs are damaged, then the feet can lose sensation and become numb. It is relatively common for people with diabetes to not feel foot problems until they have developed. Therefore, it is key to ensure the patient has regular foot examinations. (Wangnoo 2016)

The following can increase the likelihood of developing a foot ulcer: neuropathy, poor blood circulation, insufficiently well controlled diabetes, wearing poor fitting footwear and walking barefoot. People who have diabetes for a longer period or manage their diabetes less effectively are more likely to develop foot ulcers. Smoking, not taking exercise, being overweight, having high cholesterol or blood pressure can all increase diabetes foot ulcer risk. Unfortunately, for some people with diabetes, the end result of a foot ulcer can be amputation. Less serious foot ulcers can still take a long time to heal and be very uncomfortable during this time. (Wangnoo 2016)

Diabetic foot complications include: foot ulcers (open wounds on the foot), charcoal foot (deformation of the foot) and amputation. Foot ulcers can occur in anyone, and refer to a patch of broke down skin usually on the lower leg or feet. When blood sugar levels are high or fluctuate regularly, the skin would normally heal may not properly repair itself because of nerve damage. Even a mild injury can cause a foot ulcer. The nurse will teach patient how to take care of the foot and check the feet whether or complication occurs. The patient should regularly examine own feet for signs of damage. This is all the more important if patient suffering from poor circulation and numbness. If the patient has trouble checking their own feet, they may need to ask someone to help check feet. The patient careful for any of the following signs of foot damage: cuts, bruising, swelling,

grazes, sores, changes in color, ulcerations and hard skin. Also be aware of any cracking from dry skin as this could develop into an ulcer over time. (Wangnoo 2016)

2.2.2 Prevention of diabetic foot

To prevention of diabetic foot, we need to control blood glucose. Only keep blood glucose in normal range then we can to prevent the diabetic foot. Control blood sugar first need to control diet or oral hypoglycemic drugs, also can exercise to maintain body health. (Ivy, Lemos & Thomas 2008)

2.3 Diabetic nephropathy and prevention

2.3.1 Diabetic nephropathy

The diabetic nephropathy is one of the most serious diabetic complications. It is the leading cause of end-stage renal disease and usually occurs more than 10 years after the patient is diagnosed with DM. The symptom is nephrotic syndrome, such as: a large number of proteinuria, edema, hyperlipidemia, hypoproteinemia. (Wangnoo 2016.)

Kidney disease amongst diabetics is commonly called diabetic nephropathy. Statistically, around 40% of people with diabetes develop nephropathy but it is possible to prevent or delay through control of both blood glucose and blood pressure levels. Diabetes affects the arteries of the body and as the kidneys filter blood from many arteries, kidney problems are a particular risk for people with diabetes. Nephropathy is a general term for the deterioration of proper functioning in the kidneys. At an advanced level, this is called end-stage renal disease or ESRD. ESRD often stems from diabetes, with diabetes causing just under half of all cases. Diabetic nephropathy can affect people with both type 1 and type 2 diabetes. Diabetic nephropathy is divided into five stages of deterioration, with the final one being ESRD. It commonly takes over 20 years for patients to reach stage 5. (Nakamura, Kawagoe, Ogawa, Ueda , Hara, Shimada, Ebihara & Koide 2005.)

This actually referred diabetic glomerular sclerosis syndrome. At the beginning, it usually has no symptoms. Blood pressure is normal or high, then increase gradually. In early diabetes, renal volume and glomerular filtration rate increase. Gradually appears interstitial albuminuria or microalbuminuria. With the DM course being longer, persistent proteinuria, edema, glomerular filtration rate decrease, leads to uremia and renal insufficiency. These diseases threaten patients' lives. It is main cause of death of elderly hospitalized patient with diabetes. (Sudhakar & Reddy 2015.)

Diabetic nephrotic syndrome is often accompanied by hypertension, creatinine clearance rate of decline. If patient without treatment, usually four years later, it develops to chronic renal failure. The characteristic reduction in glomerular filtration rate in patients with nephrotic diabetic nephropathy usually is rapid and appears to be linear in relation to time. (Wangnoo 2016.)

2.3.2 Prevention of Diabetic nephropathy

Ingestion of blood sugar, salt and protein should be limited. Hyperglycemia, high blood pressure and high blood lipids should be controlled. Patient should change their diet and lifestyle. Avoid nephrotoxicity food and medicine. Remember to check on time. Control existing disease they have which may lead to nephropathy. (Sahoo, Mandal & Jasuja 2009.)

2.4 Nursing care of the elderly with DM

Patient should decrease sugar ingestion, get insulin and do more exercise. Check if there are redness, edema, bubble and bruise on the foot, especially on toes gap and pes pedunculi. Patients may lose most of feeling on foot. Small bruise can cause infection and become the begin of gangrene. We should decrease the pressure on foot. Patient should wear loose, soft and wide cloth shoes and ventilate leather shoes. Keep the shoes dry and choose different shoes to wear every several days. Choose suitable socks in order not to effect blood circulation. Washing foot by using about 40-degree water. Washing feet 5 to 10 minutes every day and then use towel to dry. Don't use electric blanket and hot-water bag. No smoking. Smoking lead to vasospasm and then aggravate ischemic. If patient have wound, do wound care carefully. Generally, the management of foot ulceration should address glycemic control, pressure relief/offloading, infection, lower-extremity vascular status, and local wound care. (Wangnoo 2016.)

Convalescent patients may do appropriate activities but not excessive exertion. Reasonable arrangements for life to avoid cold exacerbations or illness recurrence. Obese people should lose weight and strengthen exercise because obesity easily cause blood lipid deposition in the kidney ball, aggravate the deterioration of renal function. (Wangnoo 2016.)

Nurses should closely observe the patient's vital signs, urine volume, limb swelling and blood glucose changes and record. Patients with poor renal function should accurately record the amount of intake, especially urine. The changes of urinary protein, serum creatinine, uric acid and potassium were closely observed. If the urine volume suddenly reduced should promptly notify the doctor. (Wangnoo 2016.)

Diabetic nephropathy diet principles should be low cholesterol, low salt, low protein and low fat diet. Once the abnormal detection of trace proteinuria must reduce or do not eat plant protein, can eat high-quality animal protein. Patients with abnormal renal function must limit some high potassium containing vegetables and fruits. Under the premise of strict control of blood sugar can be appropriately increased pasta intake to avoid protein and fat decomposition more. Understanding the methods and adverse reactions of commonly used drugs in patients with diabetic nephropathy. The mental state, vital signs, skin color, urine output, urine protein and blood glucose were observed and observed during the medication. Provide reliable basis for doctors' medication. (Sexuna 2014.)

2.5 Patient counseling

We should let the patient know that he has lost some feeling on his foot. The nurse should teach the patient don't use too hot water to wash feet. Also not use hot water bag and electric blanket. Check his foot everyday if there is a wound and then tell nurses. Nurses will do it also. Protect his foot from sharp objects. In this part, the nurse needs to focus on the patient lifestyle and reduce the risk around patient. (Wangnoo 2016.)

3 RESEARCH PURPOSE, OBJECTIVE, AND QUESTIONS

The purpose of this thesis is to study the current situation regarding diabetic complications among elderly. The thesis studies two different complications: diabetic foot and diabetic nephropathy. It would also answer basic questions regarding to elderly diabetic complications.

The object of this thesis is to create awareness among nurses who takes care of elderly diabetic patient. Additionally, it would be used as a guide to patient and their family members.

The research question is:

What are the preventions method for diabetic complications among the elderly?

4. METHODOLOGY AND DATA

4.1 Literature review

Literary review is the content of academic papers, including existing knowledge, substantive discovery, and the theory of specific issues. The literature review is a secondary source and does not report new or usual experimental work. Usually related to academic literature, these comments published in academic journals, cannot be confused with the contents of the same publication. Literary review is the foundation of almost every academic field research. In this case, the review is usually done before the methodology and results of the work. (Serafy 2009.)

Basically in academic literature we learn preventions of these two kinds of diabetic complications among elderly. These can prevent by nursing interventions and health education. On the other hand, elderly patient should be paid more attention on caring. Nurses could detect the early symptoms early. The purpose is creating awareness among nurses who takes care of elderly diabetic patient and guide patient.

4.2 Data collection

Data collection is a systematic way of collecting and measuring information from a variety of sources. In order to obtain a complete and accurate result of the interested question. Data collection enables people or organizations to answer questions, get results and predict future trends. (Serafy 2009.)

For collecting academic articles for this work, We use the nursing databases Academic Search Elite (an Ebscohost database), Nursing database cinahl(an Ebscohost database). Abi inform (an Ebscohost database). Nursing database cinahl (an Sciencedirect). These databases were chosen according to my study program and my topic. Published articles which are written by English from 2004 to 2016 is the aim of my research. The amount of result is 8812.After we use keywords, the result decrease to 2157. At the end we use 13 articles. This is based on nursing topic.

The keywords we use in research are: Diabetic complication. Prevention. Elderly. Diabetic foot. Diabetic nephropathy.

Inclusion criteria:

We find results based on two complications, diabetic foot and nephropathy. We use materials about definition, cause, nursing interventions, and prevention of these complications. Patient age is more than 65. We choose scientific paper which are from 2000~2017.

Exclusion criteria:

We don't use materials about other diseases. Patient age is less than 65. Doctors work won't be used. We don't use articles older than 2000.

4.3 Data analysis

The process of data analysis to use analytical and logical reasoning to examine each component of the provided data. Analysis is one of the steps that must be done when doing an experiment. Collect, review and analyze data from various sources in order to form a certain discovery or conclusion. There are many specific data analysis methods, some of which include data mining, text analysis, business intelligence and data visualization. (Serafy 2009.)

See Appendix 1: Summary of Articles

5 Results

Our thesis studied on what nurses could do and patient should pay attention to prevent complication of diabetic mellitus. Our research question is What are the preventions method for diabetic complications among the elderly. The research used the methodology which includes literature review, data collection and data analysis.

Based on research results, we answered our research questions regarding to two different complications: diabetic foot and diabetic nephropathy.

5.1 Prevention of diabetic foot

Foot care amongst diabetics is incredibly important as foot related complications are common for those of us with diabetes. Foot ulcers affect as many as 1 out of 10 people with diabetes it can be too easily develop from blisters and small wounds to amputation. Even small ulcers on the foot can represent a serious risk. They may heal extremely slowly and need rigorous treatment to cure. Ulcers can develop into serious lower body infections, with the possibility of amputation at an advanced stage. (Ivy, Lemos & Thomas 2008.)

The presence of high blood glucose levels over a long period of time may result in a condition called diabetic neuropathy (damage to the nerves) or loss of circulation in the extremities of the body. If the nerves in feet or legs are damaged, then the feet can lose sensation and become numb. It is relatively common for people with diabetes to not feel foot problems until they have developed. Therefore, it is key to ensure the patient has regular foot examinations. (Ivy, Lemos & Thomas 2008.)

To prevention of diabetic foot, we need to control blood glucose. Only keep blood glucose in normal range then we can to prevent the diabetic foot. Control blood sugar first need to control diet or oral hypoglycemic drugs, also can exercise to maintain body health. (Ivy, Lemos & Thomas 2008.)

The patient should check on the foot daily, such as scratch, laceration, blister etc. Attention to the toe joints and soles. A small wound can cause infection. Minor wound may also the first of serious infection. Diabetes patients maybe will to lose the feeling for the feet. Sometimes the patient cannot to feel the infection happen so the nurse needs to tell the patient should check the hygiene with the

foot daily. And wearing loose, wide and soft breathable shoes is decreasing the diabetic foot risk. Avoid wearing cool light or high heels can reduce the incidence of diabetic foot. (Claire & Capobianco & Stapleton 2010)

The diabetic foot patients in daily life should pay attention to the diet management. Patients and nurses should be to plan the dietary management. Dietary principles follow the timing, ration, and ration of nutrients. Complement proteins and vitamins. Prohibit the consumption of high carbohydrate foods and high cholesterol foods gradually controlled diet. (Ivy, Lemos & Thomas 2008)

Any positive change should be helped to improve chances to avoid complications. There are a number of ways that can help improving blood sugar control. Testing the patient blood glucose, recording the test results in a blood glucose diary and then actively looking to understand the results tend is an important part of better controlling diabetes. Diabetes education courses are available to help people with diabetes get better control. However, in the modern social, diabetic patients can search online through the relevant diabetes forum or diabetes education courses, ask or counseling to the medical staff of the course. The Diabetes Forum is another great option, giving the patient the chance to pick up on the many years of valuable experience of others with diabetes. (Ivy, Lemos & Thomas 2008)

The most important thing for preventing diabetes is to report to the doctor or nurse that the patient himself can indicate symptoms of diabetes complications. This problem includes the patient's vision loss, the touch and sensitivity loss, any feeling of pain or any damage or blisters on the feet. Avoid smoking and drinking. Smoking and alcohol may increase the risk occurrence of complications, then it reducing the chances of complications. In addition, the right amount of physical activity can help improve insulin sensitivity and is considered to have other health benefits to the body. The nurse recommends to patient for at least two and a half hours of physical activity this week, or at least one and a half hours of intense activity. Eating healthy eating is a good condition for preventing complications. When taking a healthy diet to prevent complications, it is recommended to choose fresh food. (Ivy, Lemos & Thomas 2008)

5.2 Prevention of diabetic nephropathy

Ingestion of blood sugar, salt and protein should be controlled. If patient have high blood sugar for a long time, vascular permeability increase, protein leakage and store. Avoid ingest nephrotoxic drugs and diodone diodast. Get ACEI and ARB hypotensive drugs to delay disease. Check urine protein status and urinary function. If patient have kidney injure, we should check every year. No smoking and alcohol. Avoid analgesic medicine which may cause kidney injure. Limit the protein ingestion. Patient should take 0.8-1.0 gram per kg everyday. (Antia 2014.)

First control hyperglycemia, high blood pressure and high blood lipids:

When the blood glucose is timely and effective control, this change can be restored, in addition to control hyperglycemia can reduce the production of advanced glycation end products, reduce the advanced endosperm products The Control of diabetic patients with high blood pressure, can significantly reduce the incidence of diabetic nephropathy and development, reduce the incidence of end-stage renal disease. In addition to hyperlipidemia caused by atherosclerosis, but also direct damage to the kidney, low density lipoprotein, especially oxidized low density lipoprotein with chemical chemotaxis, macrophage uptake can stimulate its growth factors and cytokines, can promote Renal cell interstitial fibrosis. (Sai & Sandeep & Sanjiv 2009.)

At the same time, oxidized low density lipoprotein can also increase the production of oxygen free radicals, promote glomerular peroxide anion generation, accelerate the progress of diabetic nephropathy. During this period the patient should choose to ingest a low-protein diet. Because the high protein diet to increase the body of nitrogen products, increased glomerular filtration rate, increased kidney damage. Low protein diet can reduce urinary protein excretion, and can reduce the ball into the small artery expansion, thereby reducing the glomeruli "three high", delay the progress of renal damage. (Sai & Sandeep & Sanjiv 2009.)

The diabetic patient also need to change the bad lifestyle, include: bad diet style, smoking, drinking and fatty. It can help to down the risk of diabetic nephropathy happen. The low salt, low protein, low cholesterol and low fat diet is the principle of prevention of diabetic nephropathy. Once the micro-proteinuria abnormalities, it is necessary to reduce or not eat vegetable protein, such as beans and soy products. Can be quantitative intake of high quality animal protein such as lean meat and peeled fish and so on. If the kidney function is also abnormal but also limit some of the higher potassium

vegetables and fruits, such as rape, spinach, tomatoes, kelp, bananas, peaches and so on. (Sai & Sandeep & Sanjiv 2009.)

In the strict control of blood sugar under the conditions of appropriate increase in cereal intake to avoid protein and fat decomposition. A large number of proteinuria, edema and renal insufficiency of patients should be more specific analysis of the disease, and clear course of staging. According to the pathological changes in the pathological characteristics of the disease, to take an individual diet program. (Antia 2014.)

Early diabetic nephropathy can be carried out in the fast walking-based aerobic exercise, exercise at least once a day after meals, each time at least half an hour, at least five days a week. To avoid long-term intensity is very large can continue to increase blood pressure movement. If the emergence of clinical proteinuria should not be more intensive exercise therapy. Effective control of blood pressure: can make the kidneys from rapid failure. Treatment should be from the limit of salt intake, weight loss, smoking began. (Sai & Sandeep & Sanjiv 2009.)

Avoid nephrotoxicity medicine, such as contrast medium, antibiotics, COX-2 inhibitors, antiviral drugs, anticonvulsants, chemotherapy Drugs. Alcohol also Alcohol can also cause kidney damage. (Sai & Sandeep & Sanjiv 2009.)

In a word, this serious complication could be prevented by themselves with the help of nurses. Patient first changed their diet and lifestyle. Avoid nephrotoxicity food and medicine. Remember to check on time. Control existing disease they have which may lead to nephropathy.

5.3 What patient can do for themselves

For patient, things we write above is not suitable for them. What can patient do to prevent these complication? We asked this questions, and find many results. In a word, these serious complications could be prevented by patient themselves both with and without the help of nurses. (Sexuna 2014.)

5.3.1 Food

The patient with diabetic foot should be eating lower carbohydrate diets because of its benefits in terms of improving diabetes control, weight loss and being a diet that is satisfying and easy to stick to. Lower carbohydrate diets are flexible and can be followed by people with different types of diabetes. The diet has allowed many people with type 2 diabetes to resolve their diabetes, that is to get their blood sugar levels into a non-diabetic range without the help of medication. People with diabetes foot have also reported much more stable blood sugar levels, making the condition easier to predict and manage. The diet is a healthy way of eating as vegetables and natural, real foods are integral to the diet. (Sexuna 2014.)

Carbohydrates are nutrients that have the large impact on improving blood sugar levels. Reducing sugar levels is a benefit for patients with diabetes. The lower demand for insulin is also particularly useful. Because lowering insulin in the body can reduce insulin resistance, which helps to reverse type 2 diabetes. Insulin is also the body's fat-storing hormone, so reducing the body's insulin with low carbohydrate diets can help lose weight. (Sexuna 2014.)

The benefits of a low-carbohydrate diet typically include: improved weight loss, less chance of high sugar levels occurring, lower risk of severe hypos, more energy through the day, less cravings for sugary and snack foods, clearer thinking, clearer thinking and lower risk of developing long-term health complications. (Sexuna 2014.)

5.3.2 Drink

When the patient wants choose what to drink, there are a couple of main considerations relevant to your diabetes to take into account. The first consideration is whether, or how much, the drink will affect your blood sugar levels. The other main consideration, which will be relevant to all of us to

some degree but of particular relevance for those of us watching our weight, is to consider the calorie content of drinks. (John 2016.)

Water: the patient can't go too far wrong with pure water. It provides the hydration your body needs and is, of course, zero carbohydrate and zero calories. (John 2016.)

Milk: Moderate carbohydrate content which may need to be accounted for, particularly in people with type 1 diabetes, if drinking close to or more than 100ml. Milk tends to be a good source of energy and people that wish to watch their weight will need to take into account the calorie content of milk. Skimmed tends to have around half the calories of whole milk. (John 2016.)

Fruit juice is usually regarded as a healthy option but it should be noted that fruit juices have a relatively high carbohydrate content. The calorie content of fruit juice is similar to that of skimmed milk. Despite being quite high in carbohydrate content, fruit juice needn't be totally avoided and can be a good option before taking a sustained period of exercise as the activity may help to balance out the rise in blood sugar levels from the juice. To ensure you get good nutritional value from fruit juice, ensure you have real, unsweetened fruit juice. (John 2016.)

Fruit squash and cordials tend to be sweetened but some sugar free versions may be available. Squash and cordials don't carry the nutritional benefits of real fruit juice but can be a lower carbohydrate and lower calorie alternative to sugar soft drinks. (John 2016.)

Sugary soft drinks are high in both carbohydrate and calories and generally contain no nutritional value aside from energy, which can lead to taking in more energy than the body needs, or leading to not taking in enough vitamins and minerals. Sugary soft drinks are generally best avoided but can be useful if you specifically need to raise your blood glucose levels, such as before, during or after exercise or to help treat a hypo. (John 2016.)

Diet soft drinks tend to be popular with people with diabetes as they are low in carbohydrate and low in calories. Diet soft drinks tend to use artificial sweeteners and other artificial agents to provide sweetness, flavor and colors. Whilst soft drinks are recognized as safe for consumption, research has raised some questions over potential health issues and some people may prefer to limit or avoid their exposure to soft drinks as a precaution. (John 2016.)

6 DISCUSSION

This thesis researched on DM complications among the elderly. It talks about definition, cause, nursing interventions, prevention, patient's consideration of DM complications. It is limited in the elderly patient which are more than 65 years old.

In this thesis, we know what nurses could do to help patients. To prevent diabetic foot, we need strictly control blood glucose. We should check patient's feet daily. They should pay attention to the diet management. It is important to report any symptoms to doctor that could be indicative symptom of diabetic complications. Ingestion of blood sugar, salt and protein should be limited. Hyperglycemia, high blood pressure and high blood lipids should be controlled. Do not use nephrotoxic food and medicine. Control existing disease patient have which may lead to nephropathy.

For family members, they could encourage patient to fight against the disease and keep on prevention. In daily life, make sure the diet is suitable for patient. Remember the insulin cycle if needed and asked patient to take it. Give patient a peaceful and relaxed environment. They can accomplish with patient and even do exercise with patient together. This will increase patient aggressive to attend in prevention of DM complications.

After writing this thesis, we learned some new information for DM complications. People usually think prevention of DM complications is hard and it is nurses' work. They needn't do anything. Now we know there are so many things patient can do themselves to prevent. They can change their diet and drink, keep healthy lifestyle and check in the hospital on time. They can through the different way to understand how to prevent the diabetic complication, and choose the best method to implement it. And family member also can help them to prevent it.

The most important things in this article is, Prevention is always better than treatment. Not just in hospital, when patient in home or other place, they also should keep on prevention. It maybe a little hard for them, but it is effectively. It is a persistent challenge. We should let them know this prevention is significant. If they don't pay attention to this, these complications even can threaten their lives.

After working on this thesis, we practiced our skill on researching information, data processing capacity and writing skills. Our knowledges about DM complications are also improved.

In this thesis, the author has used secondary data collection through reading literatures that have been done previously and outlined different health problem that are associated to DM complications and how to prevent these complications before its causes serious health problems in elderly's life. The information searched was done by using Centria University of Applied Sciences databases and all references appropriately used in the thesis. This literature review follows the code of ethics, regulation and reliability. This review covers only freely accessible publications.

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Table 1: Articles summary

		ARTICLE NAME & JOURNALS	AUTHORS & YEARS	CONTENT & RESULTS OF ARTICLES
PREVENTIONS OF DM COMPLICATIONS AMONG ELDERLY	KNOWLEDGES OF DM AND DIABETIC COMPLICATIONS	Socioeconomic differences in mortality among diabetic people in Finland. Journal in Public Health. Page 691-698.	Erja, F & Matti, A & Seppo, K & Antti, R & Ilmo, K. 2010.	This article according the diabetic people have different factor effect to occur the diabetes in Finland. There are divide to the life and social factor to explain the diabetes. It introduces us the incidence and onset age in Finland.
		Structured education in type 1 diabetes in 2009. Journal in British Journal of Diabetes & Vascular Disease. Page 269-272.	Simon, R. 2009.	This article according the type 1 diabetes cause, effect factor, symptom, therapy and education. What kind of good method to prevent the diabetic, what kind of social associate can help the patient when their have prime symptoms shows the type 1 diabetes.
		Metformin for Prevention of Type 2 Diabetes. Journal in Published Page 1283-1285	Aleda, M & Donald, L. 2004	This article according the type 2 diabetes cause and prevention. Most type 2 diabetic patient cannot completely to healing when the patient get it. But if the patient can know how to prevent and what kind of the factor to cause this disease, then it is a good way to promotion health for

				themselves.
		<p>Role of crystalline in diabetic complications</p> <p>Journal in Biochemical et Biophysical Acta (BBA).</p>	<p>Vadde,S &Reddy, G & Bhanuprakash , R.</p> <p>2015.</p>	<p>This articles shows that crystalline play an instrumental role in diabetes and its complications. Upregulation of crystalline is a common feature of chronic diabetic complications.</p> <p>Chronic hyperglycemia alters the structure and function of crystalline by glycation and phosphorylation.</p>
	PREVENTION OF DIABETIC FOOT	<p>Management and Prevention of Diabetic Foot Ulcers and Infections: A Health Economic Review.</p> <p>Journal in Clinical Medicine.</p>	<p>Chow, I & Elkin, V & Einarson, R.</p> <p>2008.</p>	<p>This article according the diabetic foot prevention and treatment. There has different method to teach the diabetes patient how to prevent the diabetic foot, because this complication has high risk to occur in diabetes.</p>
		<p>Diabetic foot: Clinical presentation and management in 2015.</p> <p>Journal of Indian College of Cardiology.</p>	<p>Subhash, K.</p> <p>2005.</p>	<p>This article according diabetic foot management and, include: the foot wound care, food dietary, drinking and exercise. the good way to teach the patient understand the diabetes complication.</p>

PREVENTION OF DIABETIC NEPHROPATHY

<p>Complication in diabetic nephropathy</p> <p>Journal in Diabetes & Metabolic Syndrome: Clinical Research & Reviews.</p>	<p>Sharon, J. 2016.</p>	<p>This articles shows that diabetic nephropathy is the most prevalent diabetes associated in the complication of cardiovascular disorders. It is a major cause of cardiovascular mortality. It will impair the renal function of diabetes mellitus patients. The number of patients with chronic kidney disease developing to end-stage renal disease and required renal replacement therapy, is increasing all over the world.</p>
<p>Effect of low-density lipoprotein apheresis on urinary protein and podocyte excretion in patients with nephrotic syndrome due to diabetic nephropathy.</p> <p>American Journal of Kidney Diseases.</p>	<p>Tsukasa, N & Yasuhiro, K & Hiroshi, O & Yoshihiko, U & Masanori, H & Noriaki, S & Isao, E & Hikaru, K. 2005.</p>	<p>This articles shows that LDL apheresis effectively reduces proteinuria and podocyte excretion, ameliorating renal dysfunction in patients with nephrotic syndrome caused by diabetic nephropathy.</p>
<p>Diabetic polyneuropathy is a risk factor for decline of lower extremity strength in patients with type 2 diabetes.</p>	<p>Nomura, T & Ishiguro, T & Ohira M, & Ikeda, Y. 2017.</p>	<p>This article according the type 2 diabetes patient occur the kidney disease, eye disease and neuropathy disease. The patient should be make the early diagnosis and treatment plan to control the diabetic complication occurs, and teach them more need</p>

		Journal in Diabetes Investigation.		focus on the pre-diabetic symptoms.
		Nutritional management of diabetic nephropathy Journal in Clinical Queries: Nephrology	Antia, S. 2016.	This articles shows that diabetic nephropathy is the leading cause of end stage renal failure in the past two decades. Nutrition management is fundamental for the prevention of diabetic nephropathy. Ingestion of blood sugar, salt and protein should be controlled.