

Nursing Care in Diabetes Mellitus Type-2 in The Bougenvil Room of The General Hospital dr. H. Koesnadi Bondowoso Indonesia: Case Report

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Abstract:

Diabetes mellitus is a disease caused by the body being unable to release or use insulin adequately so that glucose levels in the blood are high. If this high blood glucose level lasts for a long time, there will be a disturbance in the alcohol metabolic pathway which results in increased sorbitol production so that various nursing problems arise, including ineffective peripheral perfusion. This study uses a case study method in the form of exposure to the results of applying the client's nursing care process in accordance with the theory, containing a discussion of nursing actions that occur in the field. This research was conducted on one client who experienced Diabetes mellitus for 4 visits starting from May 15, 2023, through data collection of interviews, observations, physical examinations, and documentation studies. The results of this study were obtained from the assessment, namely Ineffective Peripheral Perfusion in accordance with the theory, and diagnosis as in accordance with the client's condition, while the implementation refers to the interventions that have been set, and the evaluation refers to the general objectives and specific objectives that have been set in accordance with the theory.

Article info:

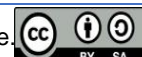
Submitted:
21-01-2024
Revised:
26-01-2024
Accepted:
29-01-2024

Keywords:

ineffective peripheral perfusion; diabetes mellitus; nursing care

DOI: <https://doi.org/10.53713/htechj.v2i1.155>

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INTRODUCTION

Diabetes Mellitus (DM), or better known as diabetes, is a collection of symptoms that arise in a person due to high blood glucose levels (hyperglycemia), this chronic disease occurs when the pancreas does not produce enough insulin or when the body cannot use the insulin it produces effectively. Insulin is a hormone that regulates blood sugar which functions to absorb glucose in the body that becomes energy. Uncontrolled diabetes over time causes serious damage to many body systems, especially nerves and blood vessels (Hanggayu, 2022). Type 2 diabetes is a problem that occurs in the body because cells are less able to absorb insulin, a condition called insulin resistance (Kurniawan et al., 2023).

The incidence of DM in the world has always increased from year to year. The latest data from the World Health Organization (WHO) shows that in 2000 as many as 150 million people in the world suffered from DM and this figure will double by 2025 (WHO, 2016). The International Diabetes Federation (2013) has reported that there are 4.6 million deaths each year and more than 10 million patients experience paralysis and complications such as heart attack, stroke, kidney failure, blindness and amputation According to data from the Bondowoso Health Office in 2022 from January to December the total number of people with Diabetes Mellitus reached 14,273 patients, with 4,773 men and 9,500 women. The first place of Diabetes Mellitus sufferers is the Wringin area with 1,133 people, the second place is in the Cermee area with 996 people, the third

place is in the Kademangan area with 921 people. From this data, the research plan will be carried out in Bondowoso Regency with the second highest number of Diabetes Mellitus sufferers. Diabetes Mellitus (DM), usually often causes medical problems and nursing problems, nursing problems that can arise in patients with DM are ineffective peripheral perfusion.

Ineffective peripheral perfusion is a decrease in blood circulation at the capillary level that can interfere with the body's metabolism (PPNI, 2017). The peripheral circulation of the legs in patients with diabetes mellitus often experiences damage characterized by peripheral arterial disease (PAD). Delays in filling the Capillary Refill Time (CRT) can indicate tissue ischemic conditions which of course will accelerate the occurrence of complications in the form of diabetic foot ulcers (Arif, (2020).

Nursing care is a series of nursing processes for patients by means of assessment, diagnosis, planning, action implementation and patient evaluation. Nursing care planning is individualistic and responsive to the patient's unique needs. The goal is to develop strategies to overcome patient obstacles or problems (Agustin et al., 2023). So comprehensive nursing action is needed through the provision of nursing care. Based on the SLKI (Indonesian Nursing Output Standards) theory in 2018, the outcome criteria to be achieved in nursing care for clients experiencing Diabetes Mellitus with Nursing Problems ineffective peripheral perfusion, namely: Pale skin color 5 (Decreased), Peripheral edema 5 (Decreased), Muscle weakness 5 (Decreased), Capillary filling 5 (Improved), Acral 5 (Improved). Based on the 2019 SIKI (Indonesian Nursing Intervention Standards) theory, efforts made in overcoming Diabetes Mellitus with Nursing Problems of ineffective peripheral perfusion are: observation: 1). Check peripheral circulation (eg. peripheral pulse, edema, color, temperature); 2). Identify risk factors for circulation disorders; 3). Monitor heat, redness, pain, or swelling of the extremities; therapeutic: 4). Avoid infusion or blood collection in areas of limited perfusion 5). Avoid blood pressure measurement in perfusion-limited extremities; 6). Avoid compressing and applying tourniquet to the injured area; 7). Perform infection prevention; 8). Perform hydration; education: 9). Encourage smoking cessation; 10). Encourage regular exercise; 11). Encourage the use of blood pressure-lowering, anticoagulant, and cholesterol-lowering drugs, if necessary; 12). Advise proper skin care; 13). Recommend a diet program to improve circulation; 14). Inform them of emergency signs and symptoms to report (e.g. pain that does not go away with rest, wound that does not heal).

STUDY DESIGN

Research Design

This research is case study research, which is a study that explores a problem or phenomenon with detailed boundaries, has in-depth data collection and includes a variety of information. Case studies are limited in time and place, and cases are studied in the form of individual activity events. This case study, is a study to explore the problem of nursing care for Mrs. S who has diabetes mellitus with ineffective peripheral perfusion problems in the Bougenvil Room of Dr. H. Koesnadi Bondowoso General Hospital. The inclusion criteria in this study were clients who met the criteria: 1) Clients suffering from diabetes mellitus; 2) Patients who have never experienced gangrene wounds; 3) Patients can communicate well and clearly; 4) Patients can still do sports activities; 5) Patients are willing to become respondents.

Research Population

The target population in this study was a client named Mrs. S, female gender, 43 years old in the Bougenvil Room of Dr. H. Koesnadi Bondowoso General Hospital.

Place and Time of Research

This study was conducted in the Bougainvillea Room of Dr. H. Koesnadi Bondowoso General Hospital in 2023 for 3 days from May 15 - May 17, 2023.

Instrument

The instrument used the medical-surgical nursing care patent format.

Data Collection

The data collection methods used include: 1) Interviews (the results of the anamnesis contain client identity, chief complaint, history of present illness, history of past illness, family history of illness and others) data sources obtained from clients, families and nurses; 2) Observation and physical examination (with the approach of inspection palpation percussion and auscultation) on the client's body system; 3) Document study and questionnaire (results of examination of relevant client data).

Research Ethics

This research has been ethically tested at the Health Research Ethics Commission of the Faculty of Health, Muhammadiyah University of Jember with number NO. 0197/KEPK/FIKES/XII/2023.

PATIENT INFORMATION

The client said abdominal pain nausea and vomiting and weakness when at the Puskesmas then taken to the hospital on May 12, 2023 in an unconscious state and when assessed on May 15, 2023 hours said his body was weak because while in the hospital he was fasted and allowed to eat only on May 15, 2023 in the afternoon and evening and the client said his appetite decreased so that his weight decreased from 60 kg to 37 kg said there was a lump on the head and there was pus and approaching there were also scars and legs often tingling and swelling. The client said he had a history of DM disease since 4 years ago. The client said he had a family history of the disease. While in the hospital the patient performs activities and mobility assisted by family. The diet provided by nutrition is filter food with a frequency of 2 times / day, the patient complains of difficulty swallowing. The patient's general condition is weak with a temperature of 36.6 ° C, pulse 128x / minute with regular rhythm, blood pressure 114/28 mmHg, breathing frequency 22x / minute, body

CLINICAL FINDINGS

Table 1. Results of the Assessment

Date/Time	DATA	ETIOLOGY	PROBLEM
May 15, 2023	<p>Subjective Data: Clients say they often tingle / free</p> <p>Objective data:</p> <ol style="list-style-type: none"> 1. Client appears limp 2. The client is attached to oxygen 5 lpm 3. The acral is palpably cold 4. Capillary Refill Time >3 seconds 5. Vital signs: 6. Blood pressure: 114/82 mmhg 7. Pulse: 129 x/min 8. Temperature: 36,6 9. SPO2: 99 % 	<p>The body's oxygen supply decreases</p> <p>↓</p> <p>Hypoxemia of peripheral cells</p> <p>↓</p> <p>Peripheral neurotic</p> <p>↓</p> <p>Metabolic and sensory disorders</p> <p>↓</p> <p>Nursing Problems: Ineffective Peripheral Perfusion</p>	Ineffective Peripheral Perfusion

Patients also get pharmacological therapy in the form of NaCl Infusion 1000 CC = 30 Drops Per Minute, Ondansetron Injection 2x4 grams, Omeprazole Injection 2x 4 mg, Anbacim Injection 3 x 1 gram, Transamin Injection 3 x 500 g. The nursing diagnosis raised by the researcher is ineffective peripheral perfusion. Inactive peripheral perfusion according to SDKI (Indonesian Nursing Diagnosis Standards) is a decrease in blood circulation at the capillary level which can interfere with body metabolism (PPNI, 2017).

THERAPEUTIC INTERVENTION

Nursing planning refers to the SKLI book (Indonesian Nursing Intervention Standards) including circulation care by observation: 1) Check peripheral circulation; 2) Identify risk factors for circulation disorders; 3) Monitor heat, redness, pain, or swelling in the extremities. Therapeutics by avoiding infusion or blood collection in areas of limited perfusion and avoiding blood pressure measurements on extremities with limited perfusion, carry out infection prevention. Furthermore, conduct education: 1) Encourage smoking cessation; 2) Encourage regular exercise; 3) Encourage proper skin care; 4) Encourage a diet program to improve circulation; 5) Inform emergency signs and symptoms that should be reported.

The first day of implementation was carried out on May 15, 2023, with 4 implementations of 5 interventions. Starting at 17:30 WIB on Mrs. S, namely Identifying the causes of Ineffective peripheral perfusion. The second implementation at 17:40 WIB is measuring blood sugar with the response: Cold acral, Capillary refill time > 3 seconds. The third implementation at 17:50 WIB is to prevent infection with the response: The client is given wound care on the head. The fourth implementation at 18:00 WIB is to recommend regular exercise with a response: The client has not been able to do the activity. The fifth implementation at 18:10 WIB is to recommend a diet program to improve circulation with a response: The client gets a special diet. In the implementation of the second day of implementation carried out on May 16, 2023, with 4 implementations of 5 interventions starting at 07:00 WIB on Mrs. S, namely Checking circulation with a response: Cold

acral, Capillary refill time > 3 seconds. The second implementation at 07:10 WIB was to measure blood sugar with the response: Random blood sugar 350mg. The third implementation at 07:20 WIB was to recommend routine.

The second day of implementation was carried out on May 16, 2023 with 2 implementations of 5 interventions starting at 2:30 pm on Mrs. S, namely Checking circulation with a response: Cold acral, Capillary Refill Time > 3 seconds. The second implementation at 15:00 WIB was to measure blood sugar with the response: Random Blood Sugar 350mg. The third implementation at 15:10 WIB is to recommend routine exercise with the response: The client has not been able to do the activity. The fourth implementation at 15:20 WIB is to prevent infection with the response: wound care in the head area.

The second day of implementation was carried out on May 16, 2023, with the implementation of 3 out of 5 interventions starting at 08:00 WIB on Mrs. S, namely Checking circulation with a response: Cold acral, Capillary refill time > 3 seconds. The second implementation at 15:00 WIB was to measure blood sugar with the response: Random blood sugar 210 mg. The fourth implementation at 15:20 WIB is to prevent infection with the response: wound care in the head area, the client's wound heals well.

Furthermore, the evaluation obtained in 3 days of management is the first day on May 15, 2023 the problem has not been resolved, of all the implementations the researcher took 4 implementations and was carried out on Mrs. S on the first day of the evaluation results as follows Subjective: The client said the client said weak, no appetite, often tingling and swelling, Objective: General condition: weak, Blood Pressure: 114/82 mmHg, Pulse: 87x/min, Temperature: 36 °C, Respiration Rate: 26x/min, limp body, dry mucosa, pale appearance, Capillary Refill Time > 3 seconds, cold warm acral, installed oxygen 5 liters per minute, Random Blood Sugar: 250 mg in Mrs. S has not been resolved seen from the objectives and outcome criteria, namely a) Pale skin color (3), b) Muscle weakness (3), c) Capillary filling (3), d) acral (3).

Second day evaluation on May 16, 2023, at 14:00 WIB the problem has not been resolved, of all the implementations the researcher took 3 implementations and was carried out on Mrs. S on the second day of the evaluation results as follows Subjective: The client said he was still weak, often tingling and swelling, Objective: General condition: Weak, weak body, dry mucosa, looks pale, Capillary refill time > 3 seconds, cold palpable acral, Client installed oxygen 5 liters per minute, Random Blood Sugar 350 mg, Blood Pressure: 97/70 mmHg, Pulse: 112 x/min, Temperature: 36.9 oC, Respiration Rate: 22 x / min in Mrs. S has not been resolved seen from the objectives and outcome criteria, namely a) Pale skin color (3), b) Muscle weakness (4), c) Capillary filling (4), d) acral (4). Second day evaluation on May 16, 2023 at 14:00 WIB the problem has not been resolved, of all the implementations the researcher took 3 implementations and was carried out on Mrs. S on the second day of the evaluation results as follows Subjective: The client said he was still weak, often tingling and swelling, Objective: General condition: Weak, weak body, dry mucosa, looks pale, capillary refill time > 3 seconds, cold palpable acral, client installed oxygen 5 liters per minute, Random Blood Sugar 350 mg, Blood Pressure: 104/74 mmhg, Pulse: 116 x/min, Temperature: 37.2 oC, Respiration Rate: 20 x / min in Mrs. S has not been resolved seen from the objectives and outcome criteria, namely a) Pale skin color (3), b) Muscle weakness (4), c) Capillary filling (4), d) acral (4).

Evaluation of the third day on July 02, 2022 the problem was resolved, of all the implementations the researcher took 2 implementations and was carried out on Mrs. S on the third day of the evaluation results as follows Subjective: The client said it had improved, Objective: Random Blood Sugar: 210 mg, General condition: adequate, Blood Pressure: 95/67 mmhg, Pulse: 107 x/min, Temperature: 37.4 oC, Respiration Rate: 20 x / min in Mrs. S is resolved seen from the

objectives and outcome criteria, namely a) Pale skin color (5), b) Muscle weakness (5), c) Capillary filling (5), d) acral (5).

DISCUSSION

Actually, death in people with diabetes mellitus does not occur directly as a result of diabetes mellitus itself, but is related to complications of diabetes mellitus. Complications of diabetes mellitus are divided into two. The first complication is microangiopathy (microvascular damage) such as retinopathy, nephropathy and neuropathy (Permata & Musta'in, 2019). While the second complication is macroangiopathy (microvascular damage) such as ischemic heart disease and peripheral blood vessels (Darmono, 2015). This occurs because hyperglycemia in patients with DM affects the flexibility of red blood cells that release O₂, so that O₂ in the blood decreases and peripheral hypoxia occurs which causes ineffective tissue perfusion. The nursing diagnosis obtained is ineffective peripheral perfusion. According to Purwanto (2016), that diagnosis is a nursing diagnosis for patients with type 2 diabetes mellitus with one of its etiologies is hyperglycemia which can be known by checking blood glucose levels.

According to researchers, nursing diagnoses for patients with type 2 diabetes mellitus have theoretical conformity that diabetic patients experience impaired peripheral perfusion characterized by hyperglycemia and decreased ABI values. Instability of blood glucose levels characterized by the value of blood glucose levels > 200 mg/dl. This shows suitability because patient Mrs. S experienced hyperglycemia with a blood glucose level of 350 mg/dl.

Peripheral perfusion disorders are caused by hyperglycemia. Uncontrolled hyperglycemia causes impaired blood flow to the periphery due to the accumulation of sugar products in the blood and abnormalities of vascular endothelial cells that interfere with the process of impulse relay activity by nerves and damage to blood vessel walls (Syafri, 2018). Inhibition of blood flow in the veins in the legs can cause obstruction of venous return against gravity (Salam & Laili, 2020). Dysfunction of venous return in the legs will result in diabetic wound complications, even if treatment is not immediately carried out, it will result in amputation, which will have an impact on reducing the quality of life of a person with diabetes (Sothornwit et al., 2018).

Normal peripheral tissue perfusion in the foot, is > 0.9 obtained from the ankle brachial pressure index (ABPI) formula, which compares the systolic value of the brachialis and the systolic value of the dorsalis pedis, while an abnormal condition can be obtained when the ABPI value < 0.9 indicates there is a high risk of injury in the foot, ABPI > 0.5 and < 0.9 patients need follow-up care and ABPI < 0.5 indicates that the foot has experienced necrotic feet, gangrene, ulcers, ulcers that need multi-disciplinary treatment. Peripheral tissue perfusion disorders can be overcome by regular exercise, because exercise is the main pillar in controlling the severity of tissue perfusion problems in diabetics in addition to support therapy in the form of giving anti-diabetic drugs and providing insulin therapy (Hoda et al., 2019).

This case study reports that within three days of management the observation results always showed that the patient's CRT was > 3 seconds. Capillary refill time (CRT) is a useful and rapid metric in determining the intravascular volume status of sick patients, especially those with conditions arising or resulting from hypovolemia. Examples of these pathological states include but are not limited to hypo- and hyperthermia, all forms of shock, bleeding, plasma volume loss in burns, gastrointestinal fluid loss through diarrhea or vomiting, excessive diuresis, and anaphylactic reactions. Information obtained from CRT assessment can then guide fluid resuscitation strategies, reassess applied therapies, and determine treatment endpoints (McGuire, Gotlib & King, 2023). Recent studies have suggested that increased capillary refill time is indicative of systemic disease

resulting from venous insufficiency or obstruction (Sudoyo, 2006; Kerry, 2007; Chang et al, 2013; Flemming, 2016). CRT or capillary refill time is an easy and quick test that produces accurate results (Flemming, 2016). An increase in peripheral capillary refill time can identify a significant risk of morbidity and mortality (Jennifer, 2007; Flemming, 2016).

This study also documented that one of the implementations carried out was education to patients such as advocating smoking cessation, advocating regular exercise, advocating proper skin care, advocating a diet program to improve circulation, informing emergency signs and symptoms that must be reported. Because people with diabetes mellitus need changes in health behavior patterns (change behavior) in a better direction. Non-pharmacological management can be done through lifestyle modifications, such as nutritional therapy, stress management and physical activity (Pratiwi et al., 2020).

CONCLUSION

This study found that there are implementations that can be done and some that cannot be done. The main one is to reduce ineffective peripheral perfusion by doing light activities. This cannot be done optimally due to the patient's condition so that the implementation is optimized by educating patients to lower their blood sugar to normal so that peripheral tissue perfusion is effective again. In addition, diabetes mellitus patients must also routinely do light activities to help effective peripheral perfusion return.

ACKNOWLEDGEMENT

Thank you to the Nursing Study Program, Universitas Bondowoso, Indonesia.

CONFLICT OF INTEREST

There is no conflict of interest in this article.

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