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THE EFFECT OF TYPE II DIABETES MELLITUS THERAPY WITH ANTI-DIABETIC DRUG & INSULIN WITH GAS GANGRENE PEDIS WITH MEGGIT-WAGNER CRITERIA

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Abstract

Diabetes mellitus itself is divided into three types, namely type 1 diabetes mellitus, type 2 diabetes mellitus, and other types of diabetes mellitus. One of the effects of this disease is the emergence of gangrene pedis. to describe the effect of therapy Type 2 Diabetes Mellitus Patients with Diabetic Oral Medicine & Insulin with Gas Gangrene Pedis from Meggit-Wagner Criteria. This research is an observational study (Non Experimental Design) using a cohort retrospective design method. The sample in this study were patients with gas gangrene pedis obtained from the patient's medical record for the period January 2021 – March 2022 at Bhayangkara Hospital Kediri. The analysis used Chi-square correlation from Pearson. Based on the results of the Association Test between Wagner Grade and DM therapy, it has a p value of 0.525, the hypothesis H0 is accepted. Chi-square and Pearson test between Wagner Grade and gas gangrene pedis therapy has a p value of 0.199. Patients with Type 2 DM who have a history of not routinely control, it is very likely that the progression will worsen with different therapeutic outcomes for each patient.

Keywords: Type 2 Diabetes Mellitus, Gas Gangrene Pedis, Metabolic Neuropathy.

INTRODUCTION

As we know diabetes mellitus is a disease caused by insulin disorders as explained by WHO that «Diabetes mellitus is a collection of anatomic and chemical problems resulting from a number of factors where there is absolute or relative insulin deficiency and impaired insulin function». The emergence of this impact in patients with diabetes mellitus accompanied by infection will increase the possibility of amputation in patients with gangrene pedis. Patients with type 2 diabetes, which is a condition where there is interference with the insulin that is produced works ineffectively on target cells, so that blood sugar levels remain high and this causes beta cells to increase production until fatigue occurs. The choice of the type of insulin therapy is determined by considering several things such as the individual's body's response to insulin, the patient's lifestyle choices, how many

injections per day you want to do, how often to check blood sugar levels, age, and blood sugar setting targets.

One of the most up-to-date methods and can be used as a reference is the results of Consensus and Consensus. According to research conducted, the most chronic complications in diabetes mellitus patients whose blood sugar levels are not controlled will increase the risk of complications in diabetes mellitus patients. Peripheral neuropathy is the main cause and often affects >50% of the deep sensory system. Avascular Necrosis / Osteonecrosis is a degenerative bone condition characterized by the death of bone cellular components due to subchondral blood supply disturbance.

It often affects the epiphyses of long bones in joints that bear too much weight, or in bones where the surrounding tissue has an infection, one of which is caused by the Staphylococcus aureus bacterium. Multiple Avascular Necrosis is an osteonecrosis event that develops as a result of vascular disturbances in the bone, causing necrosis of bone marrow cells, osteocytes and trabecular cells resulting in bone collapse in the necrotic segment. The Indonesian Ministry of Health in 2012 stated that diabetes mellitus was included in the top ten non-communicable diseases with the highest number in 2017, diabetes mellitus ranked highest in non-communicable diseases in Indonesia, namely 21,159 cases which showed an increase in cases from the previous year. Epidemiological studies conducted by the University of Indonesia show that in Indonesia there are more than one million amputations every year due to diabetic gangrene.

The results showed that 90% of other cases were more common in patients aged over 65 years with the term Keinbock disease / Crescent Osteonecrosis with most sufferers being women than men, namely 3,125 residents of the United States. Indonesia, which is a developing country, type 2 diabetes mellitus which becomes gangrene pedis is still a significant health problem because the level of community infection and death is still high and lifestyle is still bad. One of the potential causes of Multiple Avascular Necrosis in Gangrene Pedis patients is a microorganism which is a facultative anaerobic bacterium, namely Staphylococcus aureus, where the bacteria enter through the soft tissue that has injured diabetic gangrene. Conditions where sugar levels are not controlled properly can cause endothelial function disorders in blood vessels which result in blood vessels experiencing vasoconstriction. In addition, high blood sugar levels can also increase Thromboxan A2 which can cause platelet aggregation and all of which can increase the risk of plasma hypercoagulation.

Ulcers that are formed are also susceptible to infection and develop into gangrene which ends in amputation, which is a pathological process of bacterial infection from diabetic gangrene pedis. Multiple osteonecrosis can be given prophylactic therapy or reconstructive surgery in other words this therapy is to slow the progression of osteonecrosis by endoprosthetic replacement of affected bone & soft tissue. The most common prophylactic surgery is decompression of the core of the femoral head, to prevent venous congestion and to stimulate repair. Decompression can also be performed at the malleoli pedis to increase mechanical support and improve healing of avascular necrosis caused by Staphylococcus aureus in gangrene pedis, with confirmation by arthroscopic examination of the joints showing varying degrees of chondral folds and features of joint degeneration with joint collapse occurring due to gangrene pedis.

Administration of pencillin and clindamycin is included in prophylactic therapy in patients with gangrene pedis with avascular necrosis because of their broad spectrum for Streptococcal group bacteria followed by further physiotherapy afterwards.

RESEARCH METHODS

This research is an observational study (Non-Experimental Design) using the cohort retrospective design.

RESULT AND DISCUSSION

Descriptive statistics

Descriptive Statistics Table

		n	%	Mean	stdev
Wagner Grade	Grade I	1	8.33		
	Grade II	4	33.33		
	Grade III	1	8.33		
	Grade IV	3	25.00		
	Grade V	3	25.00		
Gender	Male	7	58.33		
	Woman	5	41.67		
bacterial culture	Pseudomonas aeruginosa	8	66.67		
	Staphylococcus aureus	3	25.00		
	Streptococcus pyogenes	1	8.33		
duration of DM II	less than 1 year	7	58.33		
	1 year and above	5	41.67		
Osteomyelitis	Negative	8	66.67		
	Positive	4	33.33		
Avascular necrosis	Negative	7	58.33		
	Positive	5	41.67		
Charcott	Negative	9	75.00		
	Positive	3	25.00		
DM therapy	Glibenklamid	1	8.33		
	Glimepiride	1	8.33		
	Long & Rapid Acting	1	8.33		
	Metformin	4	33.33		
	Rapid Acting Insulin	5	41.67		
Diabetic Foot Therapy	Amputasi	4	33.33		
	Debridement	8	66.67		
Age		12		42.08	17.79
Hb		12		10.50	1.93
Leukosit		12		204916.67	86379.14
Neutrofil		5		10300.00	1717.56

LED	5	21.40	1.67
GDA	12	295.42	42.61
HbA1c	12	8.33	0.49

Table of Cross Tabulation Results between Wagner Grade and DM therapy

Wagner Grade	DM therapy					Total	p
	Glibenklamid	Glimepiride	Long & Rapid Acting	Metformin	Rapid Acting Insulin		
Grade I	0	0	0	1	0	1	0,525
Grade II	0	0	0	2	2	4	
Grade III	0	0	0	0	1	1	
Grade IV	0	0	0	1	2	3	
Grade V	1	1	1	0	0	3	
	1	1	1	4	5	12	

Based on the results of the Association Test between Wagner Grade and DM therapy, it has a p value of 0.525,. Because the significance value (p) is greater than =5%, the hypothesis H0 is accepted. This means that the Wagner Grade variable with DM therapy has an insignificant relationship.

Table of Cross Tabulation Results between Wagner Grade and Pedis Gas Gangrene Therapy

Wagner Grade	Diabetic Foot Therapy		Total	p
	Amputasi	Debridement		
Grade I	0	1	1	0,199
Grade II	0	4	4	
Grade III	0	1	1	
Grade IV	2	1	3	
Grade V	2	1	3	
	4	8	12	

Based on the results of the Association Test between Wagner Grade and Diabetic Foot Therapy, the p-value is 0.199,. Because the significance value (p) is greater than =5%, the hypothesis H0 is accepted. This means that the Wagner Grade variable with Pedis Gas Gangrene Therapy has an insignificant relationship.

Discussion

Therapy for type 2 diabetes mellitus patients with pedis gas gangrene at Bhayangkara Hospital Kediri Period January 2021 – March 2022 was investigated using a retrospective design (non-experimental) cohort method by counting the number of type 2 diabetes mellitus patients with pedis gas gangrene in Bhayangkara Kediri Hospital with several variables that have been determined previously, and the results obtained H0 are acceptable / there are no significant results, which means that the therapeutic target for type 2 diabetes mellitus &

treatment outcomes varies between patients with Type 2 DM with p> 0.05

Initial therapy for people with diabetes mellitus is by non-pharmacological therapy, namely in the form of diet and exercise settings. If with this first step the goal has not been achieved, it can be combined with pharmacological steps in the form of insulin therapy or oral hypoglycemic drug therapy, or a combination of both. (Khoirunnisa, 2022). According to Permenkes 73 of 2016 Anti-Diabetic Drugs (OAD) are materials or combinations of materials, including biological products that are used to influence or investigate physiological systems or pathological conditions in the context of establishing diagnosis, prevention, healing, recovery, improvement, health and contraception for humans. The purpose of giving OAD according to the Indonesian Ministry of Health is to prevent worsening, diagnosis, and treatment of DM disease, and to know that the use of drugs can improve the patient's symptoms instead of curing his diabetes (Nabilah, 2019). Based on the results of research that has been carried out, it is found that H0 is acceptable / not significant, which means that the treatment of type 2 diabetes mellitus with diabetic foot in patients varies according to the indications between patients in consuming the OAD, and the outcome of each patient is different but stay on one goal, namely improving symptoms in patients and lowering the patient's blood sugar levels to be more stable. Metformin is an OAD whose use is most widely used by patients, due to the mechanism of action of biguanides by decreasing gluconeogenesis and increasing glucose utilization in tissues with KI in AV block patients only (Khoirunnisa, 2022).

Based on the description above, this research is a descriptive study, because the results of the study provide an overview of patient therapy type II diabetes mellitus with diabetic foot in secondary data at Bhayangkara Hospital, Kediri according to the specified period, and seeing the number of patients who have been entered according to the specified variable criteria.

The weakness in this study is that there is no analytical study that explains which therapy has the most effect on patients, only descriptive statistics are explained due to the limited number of patients, so the number (n) has not been met for retrospective analytical studies.

This research is still an early study that has weaknesses and limitations, so it is necessary to conduct further research related to the effect of type 2 diabetes mellitus therapy with diabetic foot analytically

to find out which therapy is the most effective or has an effect on patients according to the patient's blood sugar levels.

CONCLUSION

Blood sugar levels of people with diabetes mellitus above normal can result in a decrease in foot sensitivity in patients with type 2 diabetes mellitus. Patients with type 2 diabetes mellitus who experience gangrene pedis suffer from blood vessel disorders in the form of ischemia, this is due to the process of macroangiopathy and a decrease in tissue circulation which is characterized by loss of or loss of blood. reduced pulse. This often causes complications in the form of Avascular Necrosis, Charcott's disease, and/or Osteomyelitis in patients, starting from the toes or legs. Based on the description above, this study is a descriptive study, because the results of the study provide an overview of therapy in type 2 diabetes mellitus patients with gas gangrene pedis in secondary data at Bhayangkara Hospital Kediri according to the specified period, and see the number of patients who have been included according to variable criteria.

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