

THE EFFECT OF FOOT EXERCISES ON THE HEALING OF GANGRENE WOUNDS IN PATIENTS WITH DIABETES MELLITUS IN PAVILION III OF DR. RAMELAN CLINICAL HOSPITAL SURABAYA

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ABSTRACT

Introduction

Leg exercises are Wrong One part from very sport important especially For prevent worsening wound gangrene on DM patients . According to Ilyas , Ermita at all (2002: 297). Objectives in study This is analyze influence leg exercises against healing wound gangrene on Diabetes Mellitus Gangrene patients .

Method

Study This study This use method pre one group pre- post test non control group design experiment with do observation First or pretest that allows researchers test changes that occur after existence experiment (post test) , design This No own group comparison (control) (Nursalam , 2007).

Result

The results of the study of the effect of foot exercises on the healing of gangrene wounds in patients with Diabetes Mellitus Gangrene in Pavilion III of Dr. Ramelan Hospital, Surabaya using the Wilcoxon Signed Rank Test ($p < 0.05$); In the comparison results before and after the treatment of foot exercises, $p = 0.046$ so that there is a difference in the level of healing of gangrene wounds before and after foot exercises or there is an effect of foot exercises on the level of healing of gangrene wounds. While in the control group $p = 0.317$ means there is no difference between before and after. While the results of the statistical test for the comparison between the experimental group and the control group are $p = 0.421$ which is greater than ($p < 0.05$).

Conclusion

The conclusion of this study is that there is no effect of foot exercise on the healing rate of Gangrene wounds in Pavilion III of Dr. Ramelan Hospital, this can be caused by various factors that support healing other than foot exercise such as the use of therapy and care carried out on gangrene wounds. Foot exercise is one of the physical exercise treatments which is an alternative additional treatment to support wound healing. Control group clients still receive care and treatment as well as the provision of a Diabetes Mellitus Diet .

Introduction

Diabetes Mellitus is a collection of symptoms that arise in a person caused by an increase in blood sugar (glucose) levels due to absolute or relative insulin deficiency (Slamet Suyono, 2002: 8). Diabetes Mellitus patients are more susceptible to severe infections such as gangrene. Gangrene is an infection characterized by the expansion of cellulitis and the appearance of hemorrhagic vesicles. So that the surface of the gangrene appears reddish accompanied by the formation of calluses that will cause ulceration. According to observations of researchers in the Pav III room of Dr. Ramelan Hospital, it was found that the average client with Diabetes Mellitus with gangrene complications and foot exercises as one of the nursing actions that can be given to clients to prevent and support the healing of gangrenous wounds have not been optimally implemented and prioritize medication and nutrition. Foot exercises are exercises in the form of integrative movements of the feet for Diabetes Mellitus sufferers that are useful for improving blood flow to and from the feet, strengthening foot muscles, increasing joint flexibility, and maintaining nerve function (<http://www.korantempo.com>). However, until now the effect of foot exercises on healing gangrenous wounds in Diabetes Mellitus Gangrene patients at Pavilion III of Dr. Ramelan Hospital, Surabaya is not yet known.

Several studies in Indonesia report that the mortality rate of gangrenous ulcers in patients with Diabetes Mellitus ranges from 17% - 32%, while the amputation rate ranges from 15-30% (Ilyas, Ermita 2002: 293). Diabetes Mellitus is a degenerative disease whose prevalence is expected to continue to increase. From various epidemiological studies in Indonesia, there is an increase in prevalence from 1.5% - 2.3% to 5.7% in the population aged over

15 years. Meanwhile, at the Dr. Ramelan Hospital in Surabaya, there were 98 patients with Diabetes Mellitus with gangrenous complications in the Pav. III room in January - May 2007 and an average of 19-20 people per month.

Hyperglycemia in diabetes mellitus patients can cause various complications in various organs. According to Brunner and Suddart (2002: 1223), blood vessels in diabetes mellitus patients are more prone to atherosclerosis than in normal individuals. Atherosclerotic changes in the large blood vessels of the lower extremities contribute to the increased incidence of peripheral arterial occlusive disease. Poor lower extremity circulation is a contributing factor to delayed wound healing and gangrene. High blood glucose also causes nerve demyelination. Nerve conduction is disrupted if there is an abnormality in the myelin sheath. Disruptions in nerve conduction, along with capillary thickening and closure, cause peripheral neuropathy in the feet. Hyperglycemia impairs the ability of leukocytes to destroy bacteria, making DM patients susceptible to infection. This combination of factors can lead to gangrene in diabetic patients.

Foot exercises are a crucial part of exercise, particularly for preventing the worsening of gangrene in diabetic patients. According to Ilyas, Ermita, and others (2002: 297), actively contracting muscles can increase *blood flow*, thereby improving circulation and optimizing oxygen flow. Furthermore, active muscles have an *insulin-like effect*, increasing the entry of glucose into muscle cells to be broken down into energy. Lowering blood sugar levels can optimize leukocyte function and reduce the progression of peripheral neuropathy. Increased vascularization in the extremities, improved leukocyte function, and reduced neuropathy are expected to accelerate the

healing of diabetic gangrene wounds. Given this background, research is needed

to investigate the effect of foot exercises on the healing of gangrene in diabetic patients.

Material And Methodology

This research uses a pre-experimental method, *one group pre-post test, non-control group design*, by conducting the first observation or *pretest* which allows researchers to test changes that occur after the experiment (*post test*), this design does not have a comparison group (control) (Nursalam, 2007).

The research sample uses the technique *Consecutive The sampling* and samples taken were Diabetes Mellitus

Gangrene patients who met the following criteria: 1) patients did not experience hypoglycemia, 2) patients did not receive HBO therapy, 3) patients who had never received leg exercises, 4) patients with GCS 456 who were in Pavilion III of Dr. Ramelan Hospital, Surabaya.

Data analysis: *Wilcoxon Signed Rank Test*, aims to compare values before and after treatment and compare with the control group.

Results

Table 5.1 Level of Healing of Gangrenous Wounds with Foot Exercises in the Experimental Group at Pavilion III of Dr. Ramelan Hospital, Surabaya, April 10 to May 10, 2008

Healing Rate	Before		After	
Good	0	0%	1	20%
Ada repair wound	1	20%	3	60%
No There is repair wound	4	80%	1	20%
Amount	5	100%	5	100%
p = 0.046				

Table 5.2 Healing Rate of Gangrenous Wounds without Leg Exercises on Group Control in Pavilion III Hospital Dr. Ramelan Surabaya April 10th to by May 10, 2008

Healing rate	Beginning		End	
Good	0	0%	0	0%
Ada repair wound	2	40%	3	60%
No There is repair wound	3	60%	2	40%
Amount	5	100%	5	100%
p = 0.317				

Table 5.3 Influence Effect of Foot Exercise on Healing Rate of Gangrenous Wounds in Pavilion III Hospital Dr. Ramelan Surabaya April 10th to by May 10, 2008

Healing rate	Group experiment		Group control	
	before	after	Beginning	End
Good	0 0%	1 20%	0 0%	0 0%
Ada repair wound	1 20%	3 60%	2 40%	3 60%
No There is repair wound	4 80%	1 20%	3 60%	2 40%
Amount	5 100%	5 100%	5 100%	5 100%
p = 0.421				

Based on Table 5.1 Healing rate respondent's gangrene wound before done leg exercises among

others the biggest on No There is repair as many as 4 respondents (80%) and There is repair as many as 1 respondent (20%) while level healing respondent's gangrene wound after done leg exercises are good among others as many as 1 respondent (20%), there is repair wound as many as 3 respondents (60%) and No There is repair wound as many as 1 respondent (20%) and results test statistics obtained level error $p=0.046$ where not enough from ($p \leq 0.05$) so that There is difference level healing gangrene wounds before And after leg exercises or There is influence leg exercises against level healing gangrene wound .

Based on Table 5.2 Healing rate gangrene wounds without done leg exercises on beginning observation among the largest on No There is repair as many as 3 respondents (60%) and There is repair as many as 2 respondents (40%) while level healing terminal gangrene wound observation among others there are repair wound as many as 3 respondents (60%) and No There is repair wound as many as 2 respondents (40%). And the results p test = 0.317 where more big from ($p \leq 0.05$) means No There is difference between beginning

observation And end conservation on group control without done leg exercises .

Based on Table 5.3 Healing rate gangrene wounds when

compared to between group experiment And control group both experience improvement condition wound to direction There is repair wound And to direction condition good . Can seen on group experiment , before treatment No There is condition good wound , but after leg exercises are available condition good wound as many as 1 respondent (20%). Before treatment , there is repair wound 1 respondent (20%), then 3 respondents (60%). No There is repair wound , before treatment as many as 4 respondents (80%) and afterward only 1 respondent (20%)

Whereas on group control , no There is wound in condition good , 2 respondents (40%) on beginning observation And end observation of 3 respondents (60%). There was no improvement in wounds as many as 3 respondents (60%) at the beginning of the observation and 2 respondents (40%). And the results of the statistical test for the comparison between the experimental group and the control group were $p = 0.421$ where greater than ($p \leq 0.05$) means there is no difference between the experimental group and the control group or there is no effect of foot exercises on the healing rate of gangrene wounds.

Discussion

In this study, there were 10 respondents. Most of the respondents were male, aged 30-40 years, and had an average junior high school education, TNI occupation, married marital status, and Muslim religion. This study used a measuring tool or instrument in the form of an observation sheet regarding the level of gangrene wound healing before and after foot exercises and compared to without foot exercises. The observation sheet consisted of 5 question items that must be observed to the client regarding the condition of the gangrene wound. The level of gangrene wound healing was measured by the observation sheet because it requires observation by the researcher regarding the wound granulation tissue, epithelialization, type of exudate, amount of exudate, skin color around the wound, necrotic tissue, wound borders, peripheral tissue edema, wound size, and the extent of skin damage due to gangrene wounds.

Healing Rate of Gangrene Wounds with Foot Exercises in the Experimental Group

In the experimental group, the results of observations of the level of wound healing before foot exercises were carried out showed that there was improvement in the wound in 1 respondent (20%) and no improvement in the wound in 4 respondents (80%). After being given Foot Exercises with a frequency of 2 times a day for 1 month with the help of nurses, researchers and patients independently, there was an increase in the healing of gangrenous wounds in patients with the results of 1 respondent (20 %) having a good gangrenous wound condition, 3 respondents (60%) having an improvement in the gangrenous wound condition and 1 respondent (20%) having no improvement in the wound condition.

From the data above, it can be seen that there is still 1 respondent whose wound condition remains in a state of no

improvement. This can be caused by other factors that can inhibit wound healing even though foot exercises have been carried out, such as excessive exudate in the client's wound, decreased oxygen supply, where this element plays an important role in the formation of collagen, new capillaries and epithelial repair, as well as infection control. The amount of oxygen delivered to a wound depends on the partial pressure of oxygen in the blood, the level of tissue perfusion, and total blood volume. In accordance with the theory expressed by Morison M (2003), there are many factors that can slow the wound healing process, including: 1) Intrinsic factors (wound condition, general pathophysiology, physiological and psychological influences), 2) Extrinsic factors (inappropriate wound management and other therapies that can be detrimental such as radiotherapy, steroid therapy)

In addition, it was found that there was improvement in wounds before treatment in 1 respondent (20%), after treatment in 3 respondents (60%), and there was no improvement in wounds before treatment in 4 respondents (80%) and after treatment in only 1 respondent (20%). This was caused by the effect of foot exercises that had been carried out by the client twice a day for 1 month by ignoring various influencing factors. The foot exercises carried out by the client were in the form of integrative exercises on gangrenous feet, especially in clients with Diabetes mellitus so that blood circulation to the foot area increased and supported the occurrence of granulation, epithelialization in the wound causing the amount of exudate to decrease, necrotic tissue to decrease, tissue edema to decrease and wound size to decrease. In accordance with the definition of foot exercises, foot exercises are exercises in the form of foot movements in DM patients to improve blood circulation so that nutrients to the tissue are smooth, strengthen

muscles, flex joints, and maintain nerve function. (www.korantempo.com)

Results test statistics obtained $p=0.046$ where not enough from ($p \leq 0.05$) so that There is difference level healing gangrene wounds before And after leg exercises or There is influence leg exercises against level healing gangrene wounds . Foot exercises can activate muscle For contract so that can increase flow blood And *Insulin Like Effect*, so that net capillary open , flow oxygen increase , amount receptors active increased muscle nature *non-insulin dependent*, usage glucose by muscle And glucose blood decrease And condition This support healing gangrene wound .

Gangrene Wound Healing Rate without Leg Exercises on Group Control

Whereas in the data in table 5.2, it shows that No There is repair wound Where observation beginning as many as 3 respondents (60%) and observation end as many as 2 respondents (40%), and There is repair wound on beginning observation of 2 respondents (40%) and end observation of 3 respondents (60%). The data show that condition wound relatively still on beginning And end observation Where in condition There is repair And No There is repair And No There is wound in condition Good .

And the results p test = 0.317 where more big from ($p \leq 0.05$) means No There is difference between beginning observation And end conservation on group control without done leg exercises .

That matter due to by without do therapy supporters like exercise physical factors inhibitor healing wound will give influence big For lower circulation blood to extremities so that happen decline immunity And neuropathy peripheral Increased . This condition will increase wound infection and increase the progression of neuropathy. According to Morison (2000), wounds with poor blood supply can heal slowly. If essential healing

factors such as oxygen, amino acids, vitamins, and minerals are slow to reach the wound due to poor vascularization, wound healing will be hampered. Some areas of the body's skin, such as the tibia, have a poor blood supply, so even minimal trauma can cause leg ulcers that are difficult to treat.

The Effect of Foot Exercises on the Healing Rate of Gangrene Wounds

Based on the data, the level of gangrene wound healing when compared between the experimental group and the control group both experienced an increase in wound condition towards wound improvement and towards good condition. Meanwhile, the results of the statistical test for the comparison between the experimental group and the control group were $p = 0.421$ where greater than ($p \leq 0.05$) means there is no difference between the experimental group and the control group or there is no effect of foot exercises on the level of gangrene wound healing.

This can be caused by various factors that support healing even though foot exercises are not provided, such as the use of therapy and care performed on clients with gangrene. Foot exercises are one of the physical exercise treatments that are an alternative additional treatment to support wound healing and many other treatments that can support healing. Clients in the control group still received care and treatment, including a Diabetic Diet which is a nutrition to improve glucose burning in peripheral tissues and the sensitivity of beta cells in the pancreas so that it can improve peripheral blood flow and increase oxygen supply. In addition, Hypoglycemia or insulin drug therapy is still given, which is a therapy given to clients with Diabetes Mellitus with one of the goals of preventing and slowing further complications. So even without foot exercises, the wound healing process continues, but the wound healing rate will be slightly slower. According to Tjokro Prawiro (1996), there are five basic

treatments and care for Diabetes Mellitus, namely: 1) Primary therapy (Diabetes diet, physical exercise, public health education),

2) Secondary therapy (glycemia medication, pancreas transplant and insulin)

Conclusion

Based on the results of research on the effect of foot exercises on the wound healing rate at Pavilion III of Dr. Ramelan Hospital, Surabaya, the following conclusions can be drawn:

There is a difference between the level of wound healing before and after foot exercises in the experimental group of Diabeten Melitus Gangrene patients at Pavilion III of Dr. Ramelan Hospital, Surabaya.

There was no difference in the wound healing rate without foot exercises in the control group of Diabeten Melitus Gangrene patients at Pavilion III of Dr. Ramelan Hospital, Surabaya.

There is no effect of foot exercises on the healing rate of gangrenous wounds in Pavilion III of Dr. Ramel Hospital

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