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Hydrotherapy to Reduce Plasma Glucose among Patients with Diabetes Mellitus at Rsup Fatmawati (A Case Study)

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Abstract

Background: Diabetes mellitus type 2 occur when there is a problem about insulin production in the body, body resistant to the insulin, or the sensitivity of body to insulin decreased. Management of diabetes mellitus type 2 is needed to prevent further complications. Hydrotherapy is a complementary therapy by using water that can reduce plasma glucose levels among patients with diabetes mellitus. **Purpose:** the purpose of this case study is to determine the effectiveness of hydrotherapy on reducing plasma glucose level among patients with diabetes mellitus type 2. **Methods:** the type of this case study is descriptive. Data collection conducted through interviews, observation, and documentation. The subjects in this study were 2 patients with diabetes mellitus type 2 from Fatmawati General Hospital. **Result:** after finished hydrotherapy for 3 days, the patient's plasma glucose levels decreased significantly with an average decrease in subject I was 41,3 mg/dl and subject II was 23,3 mg/dl. **Conclusion:** researcher recommends hydrotherapy to be carried out by patient with diabetes mellitus type 2.

Keywords: Diabetes Melitus, Hydrotherapy, Plasma Glucose Level

Background

World Health Organization (WHO) divides diabetes mellitus into 4 types namely Diabetes Mellitus type 1 (DMT1), Diabetes Mellitus type 2 (DMT2), Diabetes Mellitus gestational, and impaired glucose tolerance (WHO, 2016). Prevalence of Diabetes Mellitus Type 2 is very high about 90-95% in the world.

Diabetes mellitus (DM) type 2 is a serious chronic disease that occurs due to the pancreas not producing enough insulin or when the body cannot effectively use insulin (Khairani, 2019). According to

American Diabetes Association (ADA), there are several criteria for diabetes mellitus based on plasma glucose levels, such as: if fasting plasma glucose (FPG) result 126 mg/dl or higher, and if random plasma glucose test results is 200 mg/dl or higher. As we know, the high plasma glucose level causing many complications such as chronic kidney disease.

International Diabetes Federation (IDF) estimates at least 463 million people aged 20-79 years in the world suffers from diabetes in 2019 or equivalent to 9.3% of the total population of the same age (IDF, 2019). Prevalence of Diabetes in

Indonesia is estimated to continue increase as the increase of age population. The number of diabetes mellitus population predicted reach 578 million in 2030 and 700 million in in 2045 (Infodatin, 2020).

Besides of that, there are several common symptoms among patients with diabetes mellitus such as frequent hunger and thirst, frequent urination in large quantities, lose weight and unstable plasma glucose level.

To prevent symptom burden among these populations, effective nursing management is needed. There are several research about nursing intervention to prevent symptom burden among diabetes population. One of new nursing management is hydrotherapy.

Hydrotherapy is a treatment by using water to get a therapeutic effect (Tarigan, 2020). Hydrotherapy was developed in India and reported to be able to overcome various health problems such as diabetes mellitus. The previous research reported by consuming water (hydrotherapy), all the poisons in the body including excess sugar can be reduced.

Hydrotherapy is a complementary therapy that easy to apply in everyday life because the tools and materials are easily to find as well doesn't cost a lot. Hydrotherapy can be used as appropriate healthy lifestyle for people with diabetes mellitus, thus, their quality of life can be increased. However, the implementation of hydrotherapy in the society is lack.

This case study aim was to explore the benefit of hydrotherapy to decrease plasma glucose level among patients with diabetes mellitus

Method

This study was descriptive case study which conducted to 2 patients with Diabetes Mellitus from Fatmawati General Hospital. There are several inclusion and exclusion criteria applied to

the patients by the researcher. This study conducted at Fatmawati General Hospital from May 17 to 20, 2023 (subject 1) and from May 24 to 27, 2023 (subject 2). Thus, total duration of each subject were 4 days. The result presented by using table and diagram.

Both subjects should drink water when they wake up in the morning. Water should be warm water, clean, do not have color (clear), odorless, and not contaminated from harmful substances. For the maximum results, respondent must consume for 14 days. However, due to the time limitation, in this case study respondent only drink water for 3 days.

Case History

•Subjects Identity

Subject 1: Subject I was male, 59 years old, Muslim, married, his last education was High school, do not have a job, live in Tangerang city. The patient treated at hospital since May 04, 2022, at 15:20 with post left knee amputation and suffer from Diabetes for about 16 years since 2006. **Subject 2:** Subject 2 was male, 66 years old, Muslim, marital status is married, his last education is Elementary School, self-employed job, and live in Jakarta. Patients has been in hospital 4 since May 11, 2022, at 16.40. He diagnosis with type 2 DM for 1 year ago (2021).

•Plasma Glucose History

Subject 1 and subject 2 has high plasma glucose level, it was > 200 mg/ dl. Moreover, subject 1 needs leg amputation because he has a wound on the foot and the wound do not get better.

•Medication History

Because plasma glucose level was high among 2 subjects, both subjects have insulin therapy from the doctor. **Subject 1:** Novorapid 6 units 3 times per day (15

minutes before eating), Lantus 16 units 1 time per 4 jam (at 10.00 PM). **Subject 2:** Humalog 10 units 3 times a day (15 minutes before eating), Lantus 8-unit 1 time a day (at 10 PM).

Nursing Intervention

Hydrotherapy has given to two subjects. The duration of this intervention were 3 days among each subject. Nurse educates the subjects to drink water right after they wake up in the morning around 4 am. Both

subjects started drinking in the morning right after waking up with distance 1-2 hours between the therapy. Thus, if the patients drink water 200 ml at 4 am, they can continue to drink at 6 am. The maximum time of drinking is at 12.00 am. The total amount of water consumed by respondents 1 and 2 were 800 ml per day. To maintain the number of plasma glucose level, nurse in the hospital also gave the insulin therapy such mentioned in the medication history to the patients.

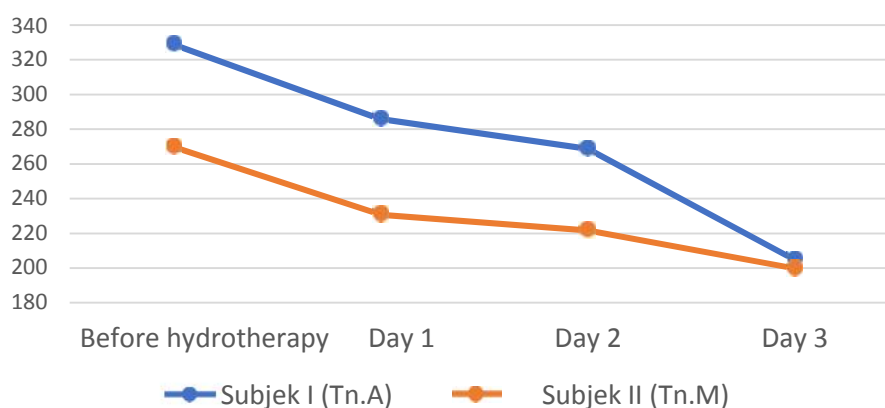


Figure 1. Level of Plasma Glucose after Hydrotherapy

Discussion

Diabetes Mellitus is a chronic disease that occurs when the pancreas is not enough in producing insulin or when the body is not efficiently using insulin. Insulin is a hormone that regulates blood sugar levels.

Hyperglycemia or increase in plasma glucose levels, is an uncontrolled effect of Diabetes Mellitus and in the long term can cause serious damage to several body systems, especially in the blood vessels of the heart which can causing heart disease, eyes (blindness may occur), kidneys (kidney failure may occur) (Varena, 2019). Nurse in the hospital has an important role to prevent this condition.

One of nursing complementary therapy to manage hyperglycemia is hydrotherapy. Hydrotherapy means drinking water every morning regularly. By drinking water regularly after waking up will improve our health condition.

Water can help kidneys to remove toxins and waste of metabolism process from body. Our kidney needs the amount of enough water to work effectively because water has function as intermediary for disposal any toxins substances. Kidney will remove these substances through urine. Furthermore, plasma glucose level also decreased by drinking water because of dilution of sugar in the blood.

Therefore, drinking water or hydrotherapy along with insulin therapy is

highly recommended for patients with Diabetes Mellitus type 2.

According to the literature, the therapy should be conducted minimum two weeks. In the first week, there is no restrictions related to the amount of water. Respondent can decide the amount of water by him/herself.

However, in the second week the amount of water should be 500 ml every morning. In the morning, the stomach has maximum function in absorbing water, thus the decrease of plasma glucose level will be maximum too (Jahidin, 2009).

Figure 1 reported the plasma glucose level from day 1 to day 4. In the day 1, the nurse assessed plasma glucose level among two subjects, and the result were 329 mg/dl (subject 1) and 270 mg/dl (subject 2). After implemented hydrotherapy, the number of plasma glucose was decreased. For subject 1, the number of plasma glucose were 286 mg/dl, 269 mg/dl, and 205 mg/dl respectively. Moreover, for subject 2 the number of plasma glucose level were 231 mg/dl, 222 mg/dl, and 200 mg/dl respectively.

According to this result, we can conclude that hydrotherapy was effective to reduce plasma glucose number among patients with diabetes mellitus. This result is in accordance with the result of previous research conducted by Saherna (2020) that hydrotherapy can reduce plasma glucose levels in people with diabetes mellitus.

Other studies also revealed that water can prevent insulin resistance due to the effects of hydration on vasopressin. Vasopressin is a hormone that plays a role in various regulation in the body. Low water intake is associated with increased risk of disease.

Therefore, it is very important to consume enough fluids to prevent from disease (Kinasih, 2022). However, among specific patients such as chronic kidney disease, hydrotherapy cannot be

implemented because lead to oedema (Kusniawati, 2017).

Conclusion

Hydrotherapy is very useful and effective to reduce plasma glucose level among patients with diabetes mellitus. Researchers recommend this complementary therapy to be implemented by the nurses in the hospital.

References

- American Diabetes Association. (2023). Understanding A1C Diagnosis. <https://diabetes.org/diabetes/a1c/diagnosis>
- International Diabetes Federation. (2019). IDF Diabetes Atlas Ninth Edition. https://www.diabetesatlas.org/upload/resources/material/20200302_133351_IDFATLAS9e-final-web.pdf
- Jahidin, A., Fitriani, L., & Wahab, M. (2019). Pengaruh terapi minum air putih terhadap penurunan kadar gula darah sewaktu (GDS) pada pasien diabetes mellitus tipe II. *Jurnal Kesehatan*, 11(1), 87-98. <https://doi.org/10.35907/bgjk.v11i1.139>
- Kinasih, N. T. (2022). *Aplikasi hydrotherapy (terapi minum air putih) terhadap penurunan glukosa darah pada pasien diabetes mellitus tipe 2* (Doctoral dissertation, Skripsi, Universitas Muhammadiyah Magelang).
- Kusniawati & Suhandi, P. (2017). Hidroterapi dapat menurunkan kadar gula darah sewaktu penderita diabetes melitus tipe 2 di puskesmas cipondoh kota tangerang. *Jurnal Medikes*, 4(2), 157–166.

- <https://doi.org/10.36743/medikes.v4i2.82>
- Saherna, J., & Rezkiawan, E. (2020). The effect of drinking water on hyperglycemia in diabetes mellitus. *Health Media Journal*, 2(1), 46-53. <https://urbangreen.co.id/journal/index.php/healthmedia/article/view/56>
- Tarigan, H.N.B. (2021). Pengaruh hidroterapi terhadap penurunan kadar gula darah sewaktu pada pasien diabetes mellitus tipe 2 di Puskesmas Binjai Serbangan Kabupaten Asahan tahun 2020. *Jurnal Penelitian Keperawatan Medik*. 3(2). 37-44. <https://doi.org/10.36656/jpkm.v3i2.662>
- Varena. (2019). *Asuhan keperawatan pada Ny Z dengan diabetes melitus di ruang rawat inap ambun suri lantai 3 RSAM Bukittinggi tahun 2019* (Doctoral dissertation, stikes perintis padang).
- World Health Organization (2016). Global Report on Diabetes. https://apps.who.int/iris/bitstream/handle/10665/204874/WHO_NMH_NVI_16.3_eng.pdf