The Effect Of Feeding Modification On Changes In The Troponin Level Of Heart Patients In Aster Inpatient Ward Of Dr. Moewardi Regional General Hospital Surakarta

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Abstract:

Background: The heart is an organ that pump blood to the entire body system and draw the blood back into the heart. The inability of the heart to perform its functions is generated by damage to the anatomy or physiology of the heart, which induces various diseases of the cardiovascular system. Cardiovascular disease is the leading cause of death in the world. (Dewanti, I.P, 2014). One in ten deaths in the world is caused by heart disease. This makes heart attacks the leading cause of death in the world every year. One of the criteria for Infarc Myocard Acute (IMA) diagnosis by World Health Organization (WHO) is an increase in heart enzyme levels. Troponin is one of the heart enzymes that will increase if there is a myocardial cell damage. A study conducted at West Sumatra Main Branch of YJI Heart Specialist Hospital in the period of July 2013 – June 2014, discovered 81 patient data with IMA diagnosis and 37 data with Troponin and ECG examination results. (Primananda, M.L, Syafri, M, and Meinapuri, 2014) Dr. Moewardi Regional General Hospital is one of the hospitals in Surakarta City that has specialized wards for patients with heart disease, one of which is the *Aster* room. Food intake in heart patients is part of the therapy given. The dietary intake of heart patients treated at Dr. Moewardi Hospital is still below 80% of the target quality of the Nutrition Installation. Low food intake can be instigated by low appetite, a feeling of abdominal bloating. Small frequent feeding portions is one way to increase the feeding intake of heart patients. Based on these circumstances, it is necessary to conduct a study to determine the effect of feeding modification and eating frequency on nutrient intake and changes in troponin level of heart patients in the Aster Ward of Dr. Moewardi Regional General Hospital Surakarta. **Purpose of the Study**: discovering the description of the effect of feeding modification on changes in troponin level of heart patients in Aster inpatient ward of Dr. Moewardi Regional General Hospital.

Method of the Study: It was an analytical description study the study design used in this study was "*One Group Pretest-Posttest Design*", which is a study design that contains *pretest* before treatment and *posttest* after treatment. Thus, it can be more accurately discovered, since it compares the result before and after the treatment is applied **Result**: The troponin level before the administration of High Protein Low Fat (HPLF) diet was higher compared to the troponin level of respondents who obtained HPLF diet. The highest Pre- and post-treatment troponin levels were > 40,000 ng/mL, while the lowest pre-treatment troponin level was 18 ng/mL, and the lowest post-treatment level was 10 ng/ml. The average difference in troponin levels was the average decrease in pre- and post-troponin tests of 1895.7 ng/ml. **Conclusion**: The description of the effect of feeding modification on changes in troponin level of heart patients in Aster inpatient ward of Dr. Moewardi Regional General Hospital is as follows: (a) The number of samples in this study is 21 respondents, with 17 men and 4 women. (b) The highest energy intake value of pre-treatment is 1638 calories, the highest intake on the first day of post-treatment is 1845 calories, while on the second day of post-treatment is 1843 calories (c) There is an average decrease in troponin level post-treatment of feeding modification of 1895.7 ng/ml.

Keywords: **Feeding modifications, troponin level, heart patients.**

Introduction:

Background of the problem: The heart is an organ that pump blood to the entire body system and draw blood back to the heart. The inability of the heart to perform its functions is generated by damage to the anatomy or physiology of the heart, which induces various diseases of the cardiovascular system. Cardiovascular disease is the leading cause of death in the world. (Dewanti, I.P, 2014). One in ten deaths in the world is caused by heart disease. This makes heart attacks the leading

cause of death in the world every year. One of the criteria for IMA diagnosis by WHO is an increase in heart enzyme levels. Troponin is one of the heart enzymes that will increase if there is a myocardial cell damage. The dietary intake of heart patients treated at Dr. Moewardi Hospital is still below 80% of the target quality target of the Nutrition Installation. Low food intake can be instigated by low appetite, a feeling of abdominal bloating. Small frequent feeding portions is one way to increase the feeding intake of heart patients.

General Purpose: Discovering the description of the effect of feeding modification on changes in troponin level of heart patients in Aster inpatient ward of Dr. Moewardi Regional General Hospital.

Specific Purpose: (a) Discovering the effect of dietary modifications on the nutritional intake of heart patients (b) Discovering the effect of feeding modifications on changes in troponin level of heart patients

Materials And Methods:

Study Design: The study design used in this study was "One Group Pretest-Posttest Design", which is a study design that contains pretest before treatment and posttest after treatment.

Population and Sample: The population was all heart disease patients admitted to Aster wards. **The sample** was a population that met the inclusion criteria: (a) Adult patients (≥ 18 years) (b) heart disease patients (c) Patients who obtained a cardiac diet in the form of soft foods (steamed rice or porridge) (d) patients treated on the second day or more in Aster ward (e) patients can be tested for troponin (f) Willing to participate as respondents

Exclusion criteria: (a) The patient moved to another inpatient ward or died (b) The patient was discharged during the study

Study Object: The object of the study in the form of food intake and troponin level before and after feeding modification treatment in the hospital. Food intake to be measured by patients in the form of macronutrients in the form of energy, carbohydrates, proteins, and fats.

Study Subject: The study subject was a heart patient who was examined for troponin in Aster Ward of Dr. Moewardi Hospital. The targeted patients were all patients who met the inclusion criteria.

Ingredients: (a) *Nutrisurvey* 2017 to calculate food intake. (b) *Comstock Form* to discover the feeding intake of heart patients (c) troponin test kits

Study Work Procedure: (a) Licensing to the head of the ward and nutritionist of Aster ward at Dr. Moewardi Regional General Hospital Surakarta. (b) Preparing study instruments including: (1) The informed consent form containing the respondent's consent to participate in the study (2) The Comstock form contains the percentage of food intake consumed by heart patients at Dr. Moewardi Regional General Hospital Surakarta. (c) Determining the number of study samples (d) Collecting troponin examination data before treatment (e) Collecting observation data on leftover food with the visual Comstock method and analyzing sample food intake data using Nutrisurvey for each group (f) Observing changes in troponin examination in heart patients before and after treatment.

Data Processing and Analysis: Data processing using Statistical Package for the Social Sciences (SPSS) software to see the percentage of patient food intake during observation. The collected data (primary data) were subsequently processed manually as well as by using computer. Data processing with a computer was conducted using the SPSS application program. The data processing was carried out through four stages, namely data editing, coding, entry, and tabulating.

Research Results:

Data Description: Study location for sampling was in Aster ward of Dr. Moewardi Regional General Hospital with a sample population of 21 respondents who obtained pre and post treatment.

Table 1. Data Description

Questionnaire	Sample Group	
	Frequency	Percentage (%)
	21	100
Total	21	100

Source: Processed primary data, 2023

Based on the characteristics of the sample, we present it in the following table.

Table 2. Description of Sex Category

Questionnaire	Sample Group	
	Frequency	Percentage (%)
Men	17	80.95
Women	4	19.05
Total	21	100

Source: Secondary data, 2023

Data on respondents in the sex category were divided into two groups, namely men and women. After testing, it obtained the percentage results of each respondent's sex category in each group, namely the control group and the treatment group. The sample group has 17 male respondents or 80.95% and 4 female respondents or 19.05%, as illustrated in table 2 above.

Table 3. Overview of Respondents' Age

| Age	Sample Group	
	Frequency	Percentage (%)
17-25	0	0
26-35	0	0
36-45	2	9.5
46-55	8	38.1
56-60	1	4.8
> 60	10	47.6
Total	21	100

Source: SPSS processed secondary data, 2023 (see appendix)

In this study, the age group of respondents was divided into 6 parts, namely 17-25 years, 26-35 years, 36-45 years, 46-55 years, 56-60 years, and over 60 years. From the results of respondent data examination, it was discovered that there was no respondent aged 17-25 years old and 26-35 years old. However, there were 2 people (9.5%) in the age group of 36-45 years, 8 people (38.1%) in the age group of 46-55 years, 1 person (4.8%) in the age group of 56-60 years and 10 people (47.6%) in the age group of over 60 years.

Results and Discussion:

Figure 1. Overview of Average Intake
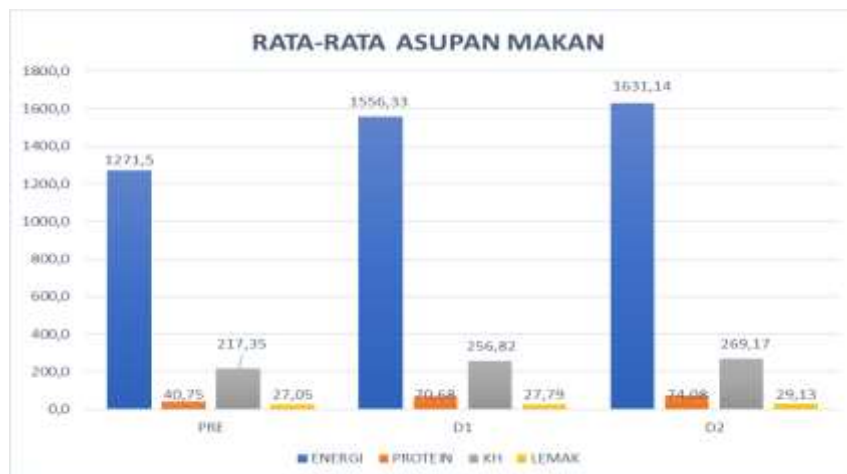
Source: Primary Data processed in SPSS, 2023 (see appendix)

Based on the average food intake of respondents starting from pre-treatment, the first day or Day 1 (D1) of treatment and the second day or Day 2 (D2) of treatment,

there was an increase. As shown in the graph above, the total pre-treatment energy was 1271.5 calories (Cal), the first day of treatment was 1556.33 Cal, and the second day of treatment was 1631.14 Cal. The specific nutrients we calculated and analyzed were Total Energy, Protein, Carbohydrate (KH), and Fat. The highest energy intake value of the pre-treatment was 1638 calories, the highest intake of the first day of the post-treatment was 1845 calories, while the second day of post-treatment was 1843 calories.

The modified diet we provided was High Protein Low Fat (HPLF). The function of protein according to Dewi and Anissa (2021) is as the main element and forming organ tissue in the human body to repair damaged tissue in the cellular, so that damaged heart cells are repaired properly by high protein intake. Meanwhile, the low fat intake given in the modified feeding treatment can reduce nausea and improve appetite. Accordingly, there was an increase in food intake between before treatment and after treatment of feeding modification.

Table 4. Overview of Changes in Troponin Level

Troponin Level	Sample Group	
	Frequency	Percentage (%)
Decrease	14	66.67
Increase	7	33.33
Total	21	100.0

Source: SPSS processed primary data, 2023 (see appendix)

The description of the troponin level of the respondents shows that there were 14 people (66.67%) who experienced a decrease after obtaining modification treatment, meanwhile there were 7 people (33.33%) who experienced an increase. The troponin level before the administration of HPLF diet was higher compared to respondents who obtained the HPLF diet. The highest pre-and post-treatment troponin level was > 40,000 ng/mL, while the lowest pre-treatment troponin level was 18 ng/mL, and the lowest post-treatment level was 10 ng/mL The average difference in troponin level was the average decrease in pre- and

post-troponin test of 1895.7 ng/ml. This is in line with the result of a study by Idrus, Asma Amaliyah (2021) showing that a High Protein Low Fat Low Carbohydrate (HPLFLC) diet induced significant weight loss in mice. The results of blood samples examination of standard diet and HPLFLC shows that the blood CKMB level on the standard diet is higher than the blood CKMB level on the HPLFLC. Blood troponin on standard diet is lower than troponin on HPLFLC, while tissue troponin level on standard diet is higher than HPLFLC. A decrease in troponin level indicates an improvement in heart muscle cell tissue.

Table 5. Pre and Post Intake T Test Results

	N	Correlation	Sig
Pre Perlakuan dan Post Perlakuan	21	0.478	0.028

Source: SPSS processed primary data, 2023 (see appendix)

Regarding food intake in modified feeding for heart patients, the results of statistical tests show significant differences in values between pre and post treatment, as illustrated in table
Based on the table above, the results of the difference test between the pre-treatment variables and the post-treatment variables

show that the correlation coefficient value is 0.478 with a significance value (Sig.) of 0.028. Because the Sig value. $0.028 <$ probability 0.05, so it can be said that there is a difference in the results of examining the value of food intake in providing modifications to heart patients

Table 6. Troponin Value Standard Deviation Test Results

	Mean	N	Std. Deviation	Std. Error Mean

Pair 1	Pre Perlakuan	14950,14	21	16244,651	3544,874
	Post Perlakuan	13054,47	21	14203,833	3099,531

Source: SPSS processed primary data, 2023 (see appendix)

Standard deviation is the square root value of the variance and shows the standard deviation of data from its average value. If the standard deviation value is smaller, it means it is closer to the average. However, if the standard deviation value is greater, it means that the variation in the data is wider. Based on the standard deviation test table for troponin values, it was found that the post-treatment results had a more even distribution of data compared to pre treatment

References:

American Heart Association. 2019. Predicting heart disease, stroke could be as easy as a blood test. Available from: https://www.heart.org/en/news/2019/04/29/predicting-heart-disease-stroke-could-be-as-easy-as-a-blood-test

Almatsier, S. 2009. *Prinsip Dasar Ilmu Gizi*. Jakarta, Gramedia Pustaka Utama.

Depkes RI. 2013. *Pedoman Pelayanan Gizi Rumah Sakit*. Jakarta: Direktorat Gizi Masyarakat.

Dewanti I, P. 2014. Lama Rawat Inap *Intensive Care Unit* (ICU) Pasien Pasca Operasi Jantung Di RSUP Dr. Kariadi Semarang. https://media.neliti.com/media/publications/105461-ID-none.pdf. Semarang: Jurnal Media Medika Muda.

Dewi dan Anissa. 2021. Peran Protein: ASI dalam Meningkatkan Kecerdasan Anak untuk Menyongsong Generasi Indonesia Emas 2045 dan Relevansi Dengan Al-Qur'an. https://jurnal.iainponorogo.ac.id/index.php/insecta. Ponorogo: Jurnal Tadris IPA Indonesia.

Endang, M. 2011. Riset Terapan Bidang Pendidikan dan Teknik. Yogyakarta: UNY Press

Ghani, dkk. 2009. "Faktor Risiko Penyakit Jantung Koroner pada Masyarakat di Indonesia." Dalam Asupan Lemak Jenuh dan Status Gizi sebagai Faktor Risiko Kejadian Penyakit Jantung Koroner di RSUP Sanglah Denpasar, oleh Ni Putu Diah Pradnyawati, 10-14. Diakses Februari 2, 2023.http://www.medistra.com/index.php?option=com_content&view=article&id=76

Kurniadi dan Nurrahmani. 2014. Stop Diabetes, Hipertensi, Kolesterol Tinggi, Jantung Koroner. Yogyakarta: Istana Media.

Idrus, Asma Amaliyah. 2021. Pengaruh Pemberian Diet Tinggi Protein Rendah Karbohidrat Rendah Lemak Jangka Panjang terhadap Kadar Enzim CKMB dan Troponin Pada Tikus Wistar Jantan. https://journal.unhas.ac.id/ Makassar.

Loaloka, M.S.,dkk. 2022. Gambaran Asupan Zat Gizi Makro dan Proses Asuhan Gizi pada Pasien Jantung Koroner Di Rsud Prof D.R W.Z. Yohanes Kupang. Kupang: Program Studi Gizi, Poltekkes Kemenkes Kupang.

Mahajan VS, Jarolim P. How to interpret elevated cardiac troponin levels. Circulation. 2011;124(21):2350- Available from: https://www.ahajournals.org/doi/full/10.1161/CIRCULATIONAHA.111.023697

Mardalena I. 2017. *Dasar-Dasar Ilmu Gizi Dalam Keperawatan*. Jakarta: Pustaka Baru Press.

Rauf, M. dan Siregar, R. 2015. *Manajemen Sistem Penyelenggaraan Makanan Institusi Dasar*. Penerbit Buku Kedokteran ECG, Jakarta.

Sudoyo. 2006. Buku Ajar Ilmu Penyakit Dalam Jilid III. Edisi IV. Jakarta: Departemen Ilmu Penyakit Dalam