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Effect of Free Radical Nitric Oxide on Hemoroid Degree Process Improvement

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ABSTRACT

This research have assessed nitric oxide (NO) levels in hemorrhoids. The study was conducted a cross sectional study to look at the profile of free radical nitric oxide (NO) with ELISA method in 80 hemorrhoids patients at Surgery Department of Hasanuddin University Faculty of Medicine, Wahidin Sudirohusodo Hospital and other network hospitals. Patients are ag⁹gated and grouped by age, sex, criterion of smokers, drinking criteria, occupation, and diet. Nitric Oxide levels are elevated in ⁹grade III and IV hemorrhoids.

Keywords : Levels of nitric oxide, hemorrhoids Patients, network hospital.

Introduction

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Hemorrhoids are one of the most common diseases that people complain of, and are a very common disease in the world, 1 in 2 patients over 50 will have the disease. But even if the patient has pain, bleeding and all the discomfort this patient has caused the patient is still taboo to talk about it, especially in female patients. Lack of communication causes longer and recurring discomfort in untreated patients, as the hemorrhoids themselves are a recurrent disease. The pathophysiology of this disease has become more and more understood in recent years with deeper hemorrhoids as well as the appearance of anal anus as the basis of disease, the damage or generation of fibroelastic tissue that is the cushion of the anus, resulting in prolapse and enlargement of the vascular tissue¹⁻⁴.

Similarly, long-standing habits cause elevation of anal canal pressure while resting, enabling venous enlargement and damaging connective tissue, there is also the influence of endocrine, age, pregnancy, obesity and dietary factors on the onset of hemorrhoidal symptoms. Free radicals are an atom or molecule in the biological system acting as an electron receiver can damage the body and cause the source of the emergence of various diseases such as respiratory disease, immune system disease, the cause of carcinogenesis, play a role of aging process and vascular disease with hemoroid process interna. The mechanism of hemorrhoids due to the effects of free radicals up to now still creates controversy⁵⁻⁸.

The effects of free radicals Nitric oxide (NO) which furthermore can cause Dexyribo Nucleid Acid (DNA) mitochondria, and can be cytotoxic and can cause micro injury to cell membrane, especially endothel vessels and epithelium is a series of early formation of symptoms of hemorrhoids, exacerbated again the influence of free radicals in obese people can cause a sliding on the anal cushion. From its form at a glance above seems to be the cause of why the hemorrhoids are more likely to occur and progressively¹⁰⁻¹⁴.

The consequences of micro injury on the membrane for any cause will increase the expression of molecular adhesions. With the increase in adhesions the molecule will raise the bioactive components in the blood such as monocytes, lymphocytes, platelets and other components that will all help the process of further formation of hemorrhoids.

MATERIALS AND METHODS

A total of 80 patients who are the subjects in this study to take serum grading III and IV. In this research the researcher will take sample of hemoroid patient grade III and IV only as inclusion criteria. Criteria of exclusion of research subjects were patients with diagnosis of colorectal cancer, patients with diagnosis of irritable bowel disease and patients with diabetes mellitus, heart disease, liver tumor and gynecologic.

8 Nitric Oxide

Nitric oxide is a derivative radical of oxygen called the reactive oxygen group. Assess the amount of NO in hemorrhoids by taking blood samples.

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Hemorrhoids

Hemorrhoids are a disease that is diagnosed by subjects with grade III and IV hemorrhoids based on criteria that have been measured by anamnesis and rectal examination.

Data Analysis

The data in this study will be processed using SPSS 22. All test results will be presented in the form of tables and graphs. To test the hypothesis, data analysis using Mann Whitney test with a tolerance of 5%.

RESEARCH RESULTS

Characteristics of Respondents

During the study period, 80 samples were obtained, including 40 patient controls. the characteristics of the overall research sample. Based on the distribution of research samples according to gender, the highest number of men were 40 people (50.0%), and 40 women (50.0%).

Based on the distribution of the sample by age group, the highest number of samples were aged 40-49 years old, 20 persons (25.0%), followed by the age group of 20-29 years, 18 people (22.5%), followed by age group 50-59 and 60 - 69 years old are 12 persons (15.0%), followed by age group > 70 years of 8 people (10.5%), followed by age group 30-39 years 6 (7.5%) and the smallest group is <20 years age group 4 people (5.0%).

Research samples with high NO (> 35.0 mM) of 34 people (42.5%), normal NO (2.5 to 35.0 mM) of 22 people (27.5%) and low NO (<2.5 mM) of 24 (30.0 %). Based on the distribution of research samples that smoked a number of 28 people (35.0%), and who did not smoke a number of 52 people (65.0%). Based on the distribution of research samples that alcohol drinkers amounted to 23 people (28.8%), and non-alcohol drinkers a total of 57 people (71.2%). Based on the distribution of research samples that ate vegetables of 8 people (10.0%), and those who did not eat vegetables were 72 (90.0%). Based on the distribution of research samples with 23 years old working (28.8%), and those who did not sit were 57 (71.2%).

NO Frequency against Smoking Criteria

The sample of NO study was divided into three categories, high if NO > 35.0 mM, normal if NO 2.5-35.0 and low when <2.5. From table 2, the distribution of NO values based on smoking and non-smoking criteria was found that the number of patients with high NO was found to be higher among people who smoked than non-smokers (19 (23.8%) vs 15 (18.8%)). many in non-smokers compared with those who smoked [16 (20.0%) vs 6 (7.5%)]. Likewise for the low NO category obtained more in patients who did not smoke [21 (26.2%) vs 3 (3.8%)].

Table 1. Distribution of NO value base on the smoking criteria

| | Smoking | | Total |
|-------------------------|------------|-------------|-------------|
| | Smoking | Not Smoking | |
| High (> 35.0 mM) | 19 (23.8%) | 15 (18.8%) | 34 (42.5%) |
| NO Normal (2.5-35.0 mM) | 6 (7.5%) | 16 (20.0%) | 22 (27.5%) |
| Low (<2.5 mM) | 28 (35.0%) | 21 (26.2%) | 24 (30.0%) |
| Total | 28 (35.0%) | 52 (65.0%) | 80 (100.0%) |

Frequency of NO on Alcohol Drinking Criteria

Table 2. Value of NO base on Alcohol Drinking Criteria

| Criteria | Alcohol | | Total |
|------------------------|---------------|-------------------|-------------|
| | Drink Alcohol | Not Drink Alcohol | |
| High (>35.0 mM) | 18 (22.0%) | 16 (20.0%) | 34 (42.5%) |
| NO Normal (2.5-35.0mM) | 4 (5.0%) | 18(22.5%) | 22 (27.5%) |
| Low (<2.5 mM) | 1 (1.0%) | 23 (28.8%) | 24 (30.0%) |
| Total | 23 (28.8%) | 57 (57.2%) | 80 (100.0%) |

Table 2 based on the criteria of drinking alcohol and not drinking alcohol it was found that the number of patients with high NO was higher in alcohol drinkers than those who did not drink alcohol [18 (22.5%) vs. 16 (20.0%)]. Normal NO categories were found in more patients who did not drink alcohol than those who drank alcohol [18 (20.0%) vs 4 (5.0%)]. Likewise, low NO categories were found in patients who did not drink alcohol compared to alcohol drinkers [23 (28.8%) vs 1 (1.2%)].

Table 3. Distribution of Working base Sitting hour

| Criteria | Working of Sitting hour | | Total |
|-------------------------|-------------------------|-------------------------|-------------|
| | Working of long sit | Working of not long sit | |
| High (>35.0 mM) | 11 (13.8%) | 23 (28.8%) | 34 (42.5%) |
| NO Normal (2.5-35.0 mM) | 7 (8.8%) | 15 (18.8%) | 22 (27.5%) |
| Low (<2.5 mM) | 5 (6.2%) | 19 (23.8%) | 24 (30.0%) |
| Total | 23 (28.8%) | 57 (71.2%) | 80 (100.0%) |

From Table 3, based on the criteria of long-term work and long-term work, it was found that the number of patients with high NO was higher in those who did not sit longer than the older ones [23 (28.8%) vs 11 (13.8%)]. Normal NO categories were found to be greater in those who did not sit longer than those who were older (15.8% vs 7 (8.8%)). Likewise, low NO categories were found to be greater in those who did not sit longer than those with long sitting [19 (23.8%) vs 5 (6.2%)].

Frekuensi NO Base on the vegetable consumption

Table 4. Distribution of NO value base on the vegetable consumption

| Criteria | Eat vegetable | | Total |
|-----------------------|---------------|-------------------|-------------|
| | Eat vegetable | Not Eat vegetable | |
| High (>35.0 mM) | 4 (5.0%) | 30 (37.5%) | 34 (42.5%) |
| NO Normal(2.5-35.0mM) | 3 (3.0%) | 19 (23.8%) | 22 (27.5%) |
| Low (<2.5 mM) | 1 (1.2%) | 23 (28.8%) | 24 (30.0%) |
| Total | 8 (10.0%) | 72 (90.0%) | 80 (100.0%) |

From Table 4, based on the criteria of eating vegetables it was found that the number of patients with high NO was higher in those who did not eat vegetables than those who ate food [30 (37.5%) vs 4 (5.0%)]. Normal NO categories were found in more patients who did not eat vegetables than those who ate vegetables [19 (23.8%) vs 3 (3.8%)]. Similarly, low NO categories were found in patients who did not eat vegetables compared to those who ate vegetables [23 (28.8%) vs 1 (1.2%)].

Comparative test of NO on hemoroid patients

Table 5. Mann whitney test of NO on hemoroid patients

| | NO Kategori | Merokok | Alkohol | Pekerjaan Lama Duduk | Makan Sayur |
|------------------------|-------------|---------|---------|-------------------------|-------------|
| Mann-Whitney U | 480.000 | 480.000 | 420.000 | 740.000 | 720.000 |
| Wilcoxon W | 868.000 | 1300E3 | 1340E3 | 1560.000 | 1540.000 |
| Z | -7.733 | -3.727 | -4.664 | -.736 | -1.481 |
| Asymp. Sig. (2-tailed) | .000 | .000 | .000 | .461 | .139 |

From table 5 it was found that the NO rating for hemorrhoids was 868.00 while the non-hemorrhoids were 2372.00. By using NO comparison test using Mann Whitney Test on hemorrhoids and control patients, there were significant results where 2-tailed values were 0.000.

| | | NO |
|--------------------------------|----------------|---------|
| N | | 40 |
| Normal Parameters ^a | Mean | 10.9100 |
| | Std. Deviation | 8.29299 |
| Most Extreme Differences | Absolute | .294 |
| | Positive | .294 |
| | Negative | -.213 |
| Kolmogorov-Smirnov Z | | 1.861 |
| Asymp. Sig. (2-tailed) | | .002 |

The number of hemorrhoids rated by smokers is 1300.00 and the control is 1940.00. Using a smoking comparison test using the Mann Whitney Test in both the hemorrhoids and control patients, there were significant results where the 2-tailed score was 0.000. The total value of hemorrhoids patients who drank alcohol was 1240.00 and the control was 2000.00. Using a comparative test of drinking alcohol using the Mann Whitney Test in both the hemorrhoids and control patients, there was a significant result where the 2-tailed value was 0.000.

Based on table 5, the total value of the hemorrhoids rating of the long sitting employee is 1560.00 and the control is 1680.00. Using a comparative test of long sitting employment using Mann Whitney Test in both hemorrhoids and control patients was found to be a non-significant result in which the 2-tailed score was 0.461. Similarly, for those who eat vegetables compared to hemorrhoids and hemorrhoids, using Mann Whitney's test, there is no meaningful result where the 2-tailed value is 0.139.

DISCUSSION

From table 3 and 4, the distribution of NO values based on smoking and non-smoking criteria found that the number of patients with high NO was higher than non-smokers [19 (23.8%) vs 15 (18.8%)]. Likewise, high NO was higher in drinking alcohol than non-alcoholic [18 (22.5%) vs. 16 (20.0%)]. This indicates that both cigarettes and alcoholic beverages affect the levels of Nitrite oxidase. Unlike the case with table 1 which shows higher high NO values in patients who do not sit longer than those who sit long [23 (28.8%) vs 11 (13.8%)]. Likewise, in table 10, NO was significantly higher in non-vegetarians than in vegetables [30 (37.5%) vs 4 (5.0%)]. This means that eating vegetables can lower levels of NO.

From table 5, using NO comparison test using Mann Whitney Test on hemorrhoids and control patients, there was a significant result where the 2-tailed value was 0.000. This shows that there is a relationship between NO and hemorrhoids. This is supported by a 2005 study of Han W et al., Conducted a study in Beijing hospital in China on 24 patients with grade III-IV hemorrhoids. The result was a high expression of iNOS indicating inflammatory factors involved in hemorrhoidal pathogenesis, and Nitric Oxide may be involved in pathological effects on the hemorrhoids.

CONCLUSIONS AND RECOMMENDATIONS

From the results of research conducted in the city of Makassar on the relationship of Nitric Oxide to 80 Hemoroid patient got the conclusion that the level of Nitric Oxide increased in hemorrhoids and Nitric Oxide levels can be used as a reference for research antioxidant therapy.

Suggestions for further investigators are the need for further research with more and more diverse samples and if there is evidence of a NO relationship as a cause or affecting the hemorrhoids it is advisable to intervene by providing antioxidants.

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