# DESCRIPTION OF URIC ACID LEVELS IN OBESITY PATIENTS IN THE LIMBOTO PUSKESMAS AREA

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## ABSTRACT

Uric acid is the end product of purine metabolism which comes from the leftovers we consume which can cause pain if the levels are excessive in the blood. Where is the relationship between uric acid and obese people, namely someone who is obese, there will be excessive calorie intake which can lead to metabolic disorders which can then trigger an increase in uric acid levels in serum which is triggered by food factors that have high levels of purines.

The purpose of this study was to determine the description of uric acid levels in obese patients in the Limboto Health Center area. This type of research is descriptive with a quantitative approach with 39 research subjects as the sample. The sampling technique uses simple random sampling (simple random sampling). The sample size is 39 respondents. Uric acid levels were measured using a microlab 300 photometer brand.This research was conducted on 24 September - 6 October 2020.

From the research that was conducted on 39 samples that met the requirements / criteria, the results of the uric acid examination in obese patients were 21 samples (53.8%), there was an increase in uric acid levels and 18 samples (46.2%) had uric acid levels. normal. Based on the research shows the results where the number of increases in uric acid levels in obese patients. It is recommended for obese sufferers to maintain a healthy lifestyle, especially a better and regular diet (nutritious food and not high in purines).

**Keywords :** Uric Acid, Obesity, Purines

## INTRODUCTION

Effort is something that is done to increase understanding, willingness and ability to live a healthy life for all individuals is basically the goal of health development in order to create a maximum degree of health, and can be used as the main capital in the development of human resources that are useful socially and economically. programs and other sectoral efforts were determined to be successful in a health development seen in the previous period that had been implemented [1]

Health development, the success of the national development of a nation can be determined by the availability of quality human resources (HR), namely human resources who have a strong mental, strong physical and health.

prime in addition to mastery of science and technology. From a health perspective, there are several factors that determine the quality of human resources,

namely a small number of people with nutrition [2]

It cannot be denied that nutritional problems continue to increase and this occurs in every age group and place ranging from urban to rural areas. Judging from the number of serious nutritional problems according to the World Health Organization (WHO) (2020), in 2014, around 462 million adults worldwide were underweight, while 1.9 billion were overweight and obese in adults, namely age. 18 years and over, of that number, in the world, there are 600 million people who are obese. In 2016, it is estimated that 41 million children under 5 years of age are overweight, almost in every country the rate of overweight children and obesity in adults is increasing, where the highest prevalence of overweight is in the WHO America region with a prevalence of 18, 5% of children and 39% of adults are obese. The lowest in the WHO South-East Asia region is Japan with a prevalence of 4.2%, so this shows that the nutritional problems that are being faced are so bad [3]

*WHO* define a person is called overweight and obese when the accumulation of abnormal or excessive fat that presents a risk to health. Body Mass Index (BMI) 25 is considered overweight and >30 is considered obese. WHO (2017), The rate of overweight and obesity continues to increase in adults and children. From 1975 to 2016. It can be seen from the data on the global disease burden that 4 million people die each year as a result of being overweight or obese. [4]

According to WHO (2017), the prevalence of overweight or obese children and adolescents aged 5-19 years is increasing more than quadrupled from 4% to 18% globally. Although various factors can cause obesity or obesity, it cannot be denied that a lot of eating without being balanced with activities that make the body move a lot or physical exercise is the most important factor in the obesity problem [4]

Excess nutrition or obesity is in the spotlight because it sees numbers that continue to increase from year to year. The accumulation of excess fat (obesity) can trigger various diseases (Setiati, et al, 2017). Referring to the data from the Indonesian Ministry of Health, (2016) in Indonesia, adults aged 18 years and over are overweight as much as 13.5%, meanwhile those who are obese are 28.7% and in children aged 5-12 years are 18, 8% were overweight and 10.8% obese. The problem of obesity has continued to increase since 2013 where the increase from 2013 to 2016 was 5.3%, namely, in 2013 it was 15.4% and increased to 20.7% in 2016 [5]

In Indonesia, according to Riskesdas 2018 data, obesity has increased by 7% in the last six years in adults >18 years, namely 14.8% to 21.8%. Then obesity at the age of >15 years has also increased by 4.4% in the last six years, namely 26.6% to 31.0% in 2018 or as many as 692 thousand people Where this number is classified as high [6]

Meanwhile, according to Widarti and Zulfian [5] in their research in 2018, there was a percentage of obesity between the ages of 13-15 years in Indonesia in 2013 of 10.8%, so this shows that the prevalence has decreased by 4% but there has been a significant change because There has been a considerable increase until 2018 and is something that needs to be considered by all parties. Because based on data from Riskesdas (2018), the figure shows 21.8% for obesity and that number has continued to increase since 2007 by 10.5% then 14.8% of the total age group in 2013 [5]

Based on data from Riskesdas (2018), The province with the highest obesity sufferers was North Sulawesi with a prevalence of 30.2%. The province that is

in second place as the province with the most obesity sufferers is DKI Jakarta with a prevalence of 29.8%. East Kalimantan Province which has obesity sufferers with a prevalence of 28.7% is the third largest in Indonesia [5]

According to Riskesdas (2018) data, Gorontalo Province itself is in the 10th place for obesity sufferers throughout Indonesia with a prevalence of 24.4%. According to Dikes Gorontalo (2019), Gorontalo in 2017 amounted to 517 people, then increased by 8,020 people in 2019, and the area with the greatest number of obesity compared to some areas in Gorontalo province is Gorontalo district with a total of 4,327 people. . If you look at the growth rate from 2017 of 517 people then into 2019 of 8,020 people, this shows that there has been a fairly large increase in obesity in Gorontalo, namely an increase of 40%, especially in Gorontalo District, amounting to 4,327 people [5]

According to Lingga (2012), uric acid is the end product of purine metabolism which comes from the leftovers we consume. Normal uric acid levels in adult women are 2.4-5.7 mg / dL; adult men 3,4-7,0 mg / dL; and children 2.8–4.0 mg / dL [7]. There is a close relationship between the accumulation of excess fat in the body or what is called obesity and the occurrence of uric acid, that is someone who is obese, there is an excessive intake of calories in the body, which can trigger metabolic disorders so that it can cause uric acid in the serum to become high which is triggered by several factors such as levels of purines in food.

Based on data obtained from the district health office Gorontalo (2019). There were 14,397 identified obese patients who were divided in several areas in Gorontalo district with the first largest number in the Buhu Puskesmas area with 2,236 people, then the second highest was in the Limboto Health Center area with 2,083 people and the third largest was Telaga. Blue, namely 1,537 inhabitants. There were 766 people with obesity at the Limboto Health Center in 2018 and in 2019 there were 2,083 [9].

So that based on the problems and background above, the researcher wanted to do research on the description of uric acid levels in obese people in the Limboto Health Center area, Gorontalo District.

## RESEARCH METHODS

This research is a descriptive research with a quantitative approach. This study aims to explain the existing phenomena by using numbers to compare individual or group characteristics to determine the value of the independent variable, either one or more (independent) variables without making comparisons. This type of research is descriptive approach to see an overview of the results of gout examination in sufferers. obesity in the Limboto health center area.

Design This study used a cross sectional design (cross section). This cross sectional study was used to see the description and factors that could cause uric acid levels in the Limboto Health Center area. The sampling location was in the Limboto area and the examiner was at the Limboto Health Center Laboratory. The population in this study were 401 obese patients who were in the Limboto area.

The sample is part of the population that is the object of research. The sample used in this study were people with obesity with a total of 39 samples based on the calculation of the sample size. While the examination specimen is venous blood of obese patients.

The sampling technique was carried out by simple random sampling (simple random sampling). The technique of taking samples from members of the population was done randomly without

paying attention to the strata in the population.

In this study, the research sample came from obese patients with sample criteria/considerations, the inclusion criteria, namely the age of the patient above 15 years, the age of the patient is a maximum of 45 years, the sample who is obese based on the calculation of BMI (Body Mass Index) and the patient is willing to be taken. Blood for research purposes. Then the Exclusion Criteria, namely the patient is not sick (fever, flu and others), the sample is not obese based on the calculation of BMI (Body Mass Index) and the patient does not want blood drawn for research purposes.

The data processing technique consists of the Editing stage, which is the stage of checking and improving the results of the answers to the questionnaires that have been previously given to respondents. At this stage, it is also seen whether the questions have been answered completely or not. Then the coding stage, which is the process of giving codes in the form of numbers on a questionnaire or questionnaire. The process of giving this code is to make it easier for researchers to process further data. Furthermore, Scoring is the stage of giving a score or score on the questionnaire based on each question answered by the respondent. The last stage of tabulating

This is the stage of calculating data from answers answered by respondents who have previously been coded. The data is then entered into the table. At this stage each variable will be ready to be analyzed.

The instruments used for this uric acid examination are Torniquet, Klinipet, tube rack, centrifuge, blue tip, yellow tip and photometer. The materials used for this research were Disposible, 70% alcohol cotton, uric acid reagent, standard reagent, red closed vacuum tube.

This Inspection Inspection Procedure uses a photometer, which is the process of working, namely the preparation of the tools and materials to be used. Preparation of respondents for venous blood sampling. Perform a venous blood draw according to the next procedure Blood is collected in a red vacuum tube without anticoagulants.

**Table 1.** Uric acid examination work procedures

| Pipet ke dalam tabung reaksi | Blanko | Standar | Sampel |
|---|---|---|---|
| Sampel | - | - | 20 µl |
| Standar | - | 20 µl | - |
| Reagen | 1000 µl | 1000 µl | 1000µl |

Source: Primary data (2020)

The post-analytic stage is the stage for reporting the results of the examination, namely the reference value for uric acid levels is the normal value for adult women: 2.4-5.7 mg / dL and adult men: 3.4-7.0 mg / dL.

In this study, researchers used the SPSS (Statistical Package for Social Science) program in data analysis techniques. The data analysis in this study uses descriptive statistics, namely statistics that are used to analyze data by describing the collected data as it is, with no aim to draw any conclusions about the larger parent cluster.

Presentation of data is one of the activities in making the results of research that has been carried out so that it can be understood and analyzed according to the desired objectives. In this study, the presentation of data is presented in table form where calculations have been made of the value of an increase or decrease in the sample being examined later accompanied by a narrative.

The operational definition in this study is uric acid levels in obese patients, factors that can affect from a genetic

perspective where genes are the factors that determine the inheritance of certain traits from a person to their offspring, drugs where the drug is an ingredient or a combination of ingredients. ingredients to be used in diagnosing, preventing, curing diseases, consumption of high-purine foods where purines derived from nucleic acid catabolism are converted directly to uric acid, and physical activity where inadequate physical activity is probably one of the main causes of the increased incidence of obesity in Public.

**RESEARCH RESULT**

This research was conducted at the Limboto Health Center on September 24 - October 6 2020, with the aim of knowing the uric acid levels in obese patients in the Limboto Health Center work area in 2020. The sample used for this study was 39 people.

Results of Examination of Uric Acid Levels in Obesity Patients in the Limboto Health Center Area.

**Table 2**. Frequency Distribution of Uric Acid Levels in Obesity Patients in the Limboto Community Health Center.

| Jenis Kelamin | Keterangan Nilai Normal Kadar Asam Urat | Hasil Kadar Asam Urat | | Total |
|---|---|---|---|---|
| | | Normal | Abnormal | |
| Laki—laki Normal | 3,4-7,0 | 7 (17,9%) | 0 (0%) | 7 (17,9%) |
| Laki-laki Anormal | >7,0 | 0 (0%) | 7 (17,9%) | 7 (17,9%) |
| Perempuan normal | 2,4-5,7 | 11 (28,2%) | 0 (0%) | 11 (28,2%) |
| Perempuan abnormal | >5,7 | 0 (0%) | 14 (35,9%) | 14 (35,9%) |

Source: Primary Research Data (2020)

Based on Table 2, it can be seen that the uric acid level in normal female patients was 28.2%, while in patients who had increased uric acid levels in women by 35.9%. Then for the results of normal male uric acid levels were 17.9% while male uric acid levels increased by 17.9%. More abnormal female patients, namely 35.9% compared to abnormal men,

namely 17.9% at Limboto Health Center, Gorontalo Regency in 2020

**Table 3.**
Frequency Distribution of Obesity Patients by Gender

| Jenis Kelamin | Hasil Kadar Asam Urat | | Total |
|---|---|---|---|
| | Normal | Abnormal | |
| Laki-laki | 7 (38,9%) | 7 (33,3%) | 14 (42,2%) |
| Perempuan | 11 (61,1%) | 14 (66,7%) | 25 (57,8%) |
| Total | 18 (46,1%) | 21 (53,8%) | 39 (100%) |

Source: Primary Research Data (2020)

Based on Table 3, it shows that abnormal uric acid levels were more in the female sex as much as 57.8% compared to the male gender as much as 42.2%.

**Table 4.** Frequency Distribution of obese patients who consume drugs

| Mengkonsumsi Obat | Hasil Kadar Asam Urat | | Total |
|---|---|---|---|
| | Normal | Abnormal | |
| Ya | 0 (0%) | 4 (19,0%) | 4 (10,4%) |
| Tidak | 18 (100%) | 17 (81,0%) | 35 (89,7%) |
| Total | 18 (46,1%) | 21 (53,8%) | 39 (100%) |

Source: Primary Research Data (2020)

Based on Table 4, it shows that more obese patients do not consume drugs, namely as much as 89.7% compared to those who consume drugs, namely as much as 10.4%.

**Table 5.** Frequency Distribution of obese patients by age

| Usia | Hasil Kadar Asam Urat | | Total |
| --- | --- | --- | --- |
| | Normal | Abnormal | |
| 17-25 | 15 (83,3%) | 15 (71,4%) | 30 (76,9%) |
| 36-45 | 3 (16,7%) | 6 (28,6%) | 9 (23,1%) |
| Total | 18 (46,1%) | 21 (53,8%) | 39 (100%) |

Source: Primary Research Data (2020)

Based on Table 5, it shows that the results of uric acid levels in obese patients are more abnormal at the age of 17-25 years, which is 71.4% compared to those aged 36-45 years, which is 28.6%.

**DISCUSSION**

This study used a sample of obese patients in the work area of the Limboto Health Center, Gorontalo District in 2020 where the criteria for obese patients are said to be obese if they have a Body Mass Index (BMI)> 27% aged 15 to 45 years.

1. Results of Examination of Uric Acid Levels in Obesity Patients

The cause of increased uric acid levels in obese patients is because obese people tend to often consume foods that contain lots of purines and are rich in fat, where foods that are rich in fat or contain lots of purines are mostly obtained from fast food and also sweet and fizzy drinks [10] . From the many consuming foods and drinks that can cause fat accumulation and also high purines in the body, it can cause a person's health problems, one of which can cause gout [11].

Based on the results of the research conducted, obtained uric acid levels from 39 samples of obese patients, namely 53.8% experienced an increase in uric acid levels combined between male and female patients. Meanwhile, the total normal between men and women was 46.2%. The results showed that most of the respondents had elevated uric acid levels or high uric acid levels.

The results of this study are in accordance with the research conducted by Toda, et al. (2018) [12], in which the study stated that obesity can trigger a buildup of uric acid levels in the body by as much as 60% and normal results as much as 40% because obese people can giving a holding load on the support of the joints of the body, so that the food substances that enter the body which are converted into uric acid accumulate more in the joints so that it can increase uric acid levels in the blood in obese people.

2. Gender

Men are more likely to have high uric acid levels than women, especially at the age of 30 years and over because women produce a lot of the hormones estrogen and uric acid will be released during menstruation, women are at risk of developing uric acid after entering menopause [13].

The research conducted showed that more women had high uric acid levels than men, that is, women with abnormal uric acid were 57.8% more than male, 42.2%.

So it can be seen that the results of research and theory are not in line. However, this can happen because this study did not use a sample with a balanced gender so that the results obtained were also not balanced because in this study there were more female patients than men.

3. Taking Drugs

The use of certain drugs can increase the absorption of uric acid in the kidneys and vice versa can reduce uric acid excretion in the urine, for example taking aspirin can increase uric acid in the body because there is an active ingredient in acetylsalicylic

acid which can trigger uric acid levels to increase in the blood. 14].

Based on the results of the study, 10.3% of obese patients who took drugs with abnormal results were obtained and 89.7% of those who did not consume drugs.

The results obtained indicate that the study is not in line with the theory, but in this study only 10.3% of patients who consumed drugs from 100% took drugs which did not seem to touch half of the existing patient numbers so that the low level of significance did not. can be a reference in the results of this study.

However, the results of a previous study entitled factors associated with uric acid levels in the blood of gout patients by Sukarmin (2015) [15] showed that there was no relationship between the consumption of drugs at risk of gout and taking drugs as much as 82.9 % This can happen because the drugs consumed by the respondents are not medicines that contain active ingredients that can increase uric acid levels, this must be seen in detail about the correctness of the drugs consumed by the respondents who were used as research samples. Various theories suggest that the drug that most often causes high uric acid levels is aspirin.

4. Age

Uric acid is not only in obese people but everyone has uric acid levels in their body because each metabolism normally produces uric acid levels afterwards. However, in this case, which is the main case in obese people, the metabolism of uric acid in the body tends to produce excessive uric acid levels which are triggered by several factors and one of the factors that tends to occur in obese people is the food and drink they consume [16]

The study showed that the results of uric acid levels in obese patients were more abnormal at the age of 17-25 years, which was 71.4% compared to those at the age of 36-45 years, which was 28.6%. So it can be stated that uric acid levels can increase in adolescence-adults if someone is obese.

Often eats whatever he wants, especially fast food and sugary and fizzy drinks without considering the nutritional content or content in it which then becomes a problem in the end result of metabolism. The body provides 85% of purine compounds in the body every day as needed for the body. Which means that the body needs about 15% purine from food but most of these concepts have been violated by people, especially in obese people who consume lots of food regardless of the nutritional content in it. 16].

So that when viewed from the number of consuming foods that are rich in fat and high in purines in obese people, it is very clear that this is what causes the increase in uric acid levels in the blood of obese people regardless of the age limit of obese people.

The results of this study are in accordance with the research conducted by Toda, et al (2018) [12] where in the study stated that obesity can lead to a buildup of uric acid levels in the body by as much as 60% because obese people can put a burden on the joints of the body, that way the food substances that enter the body which are converted into uric acid accumulate more in the joints so that it can increase uric acid levels in the blood in obese people.

**CONCLUSION**

Based on the research that has been done, it can be concluded that from 39 samples of obese patients who were examined for uric acid and the results were 21 samples (53.8%) there was an increase in uric acid levels and as many as

18 samples (46.2%) there was no increase. uric acid levels.

The main factors that were assessed to increase uric acid levels in the study showed that the gender factor had a significant effect on the uric acid level, namely 53.8%, the age factor did not appear to have an effect in subsequent studies, the effect of drugs was very small, namely 10 , 4% and the most important factor causing the increase in uric acid levels in obese patients is from the intake of food and drinks that enter the body, which is 60% which is not controlled by frequent eating of ready-to-eat foods and drinks that contain high purines.

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