COMPARISON OF EXAMINATION OF URINE PROTEIN USING REGULAR HEATING METHODS AND 6% ACETIC ACID HEATING METHODS IN TRIMESTER III PREGNANT WOMEN IN PUSKESMAS KABILA DISTRICT BONE BOLANGO

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ABSTRACT

A clinical laboratory is a means of measuring, determining and testing samples from humans that are used to determine the type of disease. Every examination, each stage has errors that can affect the results of the examination. The error in the pre-analytic stage reached 68%, 25% in the analytic stage, while in the post-analytic stage the error was approximately 14%. Proteinuria is a prerequisite for the diagnosis of preeclampsia. This research aims toknow the comparison of urine protein examination using the usual heating method with the heating method of 6% acetic acid in pregnant women in the third trimester at Kabila District Health Center. Bone Bolango.

This type of research uses comparative analytical research, which is to compare the similarities and differences between two or more properties and facts of the object under study based on a certain frame of mind.The number of samples in this study were 14 people from a total population of 14 people with a total sampling technique. The data analysis used was univariate analysis and bivariate analysis using the Wilcoxon test.

From the results of this study, it can be concluded that the ordinary heating method has positive results + (+1) of 1 person with a presentation of 7.1% and the heating method of 6% acetic acid does not find any positive results. Wilcoxon test results show insignificant value 0.317> 0.05 this is because the sample size in this study does not meet the test requirements so that it affects the test results. It is hoped that pregnant women will carry out control in order to know as early as possible the diseases that will arise.

Keywords: Urine Protein, Usual Heating Method, 6% Acetic Acid

INTRODUCTION

The laboratory is an integral part of health services so that the laboratory is needed for the implementation of various health programs and efforts. The clinical laboratory is a means of measuring, determining and testing samples from humans which are used to determine the type of disease, factors that affect health, diagnosis and decision making [15].

In general, quality in the laboratory is influenced by two basic components, namely the quality of inspection and quality of service. Quality inspection is the quality that is the target of every process in a quality control procedure. Inspection quality is influenced by two

main things, namely accuracy (precision) and precision (precision). Examinations in the laboratory will have good quality if the accuracy and precision are also good. The laboratory will provide clinicians with information in the form of examination results so that it can be used to establish a diagnosis and follow-up treatment for patients [15].

Internal Quality Assurance (PMI) is quality assurance carried out by the laboratory itself using a control serum. Internal Quality Assurance covers all stages from pre-analytic, analytic to post-analytical. The pre-analysis stage includes patient preparation, human resource competence, evaluation of examination requests, sample submission, and sample acceptance. The analytic stage includes everything at the time of carrying out the examination. The post-analytic stage includes recording and reporting the results. Every examination, each stage has errors that can affect the results of the examination. The error in the pre-analytic stage reached 68%, 25% in the analytical stage, whereas in the post-analytic stage the error was approximately 14% [15].

Protein in normal urine is very small, less than 100 mg protein / 24 hours, 2/3 of this amount is protein released from the tubule, usually protein that has exceeded the limit of more than 150 mg protein / 24 hours is not normal, this can be found in glomerular capillary membrane defects, or due to interference with tubular reabsorption mechanisms or damage to both mechanisms [16].

Proteinuria is a prerequisite for the diagnosis of preeclampsia. One of the factors causing maternal and infant mortality, namely preeclampsia and eclampsia which is not handled properly can lead to complications for the fetus and mother [4].

One of the factors causing maternal and infant mortality, namely preeclampsia and eclampsia which is not handled properly can lead to complications for the fetus and mother. Preeclampsia and eclampsia consist of three kinds of symptoms, namely hypertension, proteinuria and edema. Proteinuria examination in pregnant women is important in diagnosing and determining the light weight of preeclampsia [4].

According to the results of SUPAS data (Inter-Census Population Survey) in 2015, Indonesia is one of the countries with the highest maternal mortality rate (MMR) in ASEAN. There are 305 deaths in every 100,000 live births that die from illness or complications related to pregnancy and childbirth [1].

As for several provinces in Indonesia that had a high maternal mortality rate in 2015, namely Central Java Province with 668 cases, East Java Province with 642 cases, North Sumatra Province with 249 cases, Banten Province with 216 cases. For the rest, some regions contribute 25 percent and less than 25 percent of the total maternal mortality rate [8].

Based on existing data in Gorontalo Province for 2 years the MMR (Maternal Mortality Rate) has not yet reached the specified target. In 2018, it is known that the maternal mortality rate reached 33 cases or the maternal mortality rate was 298 / 100,000 live births [2].

Based on data obtained from the Bone Bolango District Health Office, the number of pregnant women who had a high risk in 2017 was 696 people, in 2018 there were 698 people, while in 2019 there were 699 people. The most health centers that had high-risk pregnant women were Kabila health centers with 102 high-risk pregnant women, 49 people from Kabila Bone Health Center, and 48 Bonepantai Puskesmas people [3].

According to data obtained from Kabila Health Center, the number of pregnant women who have a high risk in Kabila Health Center in 2017 was 130

people, in 2018 there were 103 people, and in 2019 there were 129 people [10].

There are several methods of checking urine protein that are often used, namely the 6% acetic acid method, the 20% sulfosalicylic acid method, and the dipstick or dipstick method. Some puskesmas still use manual examinations. However, in this urine protein examination, there are differences in the method of examination, namely not using the addition of acetic acid or sulfosalicylic acid as reagents. This is different from the standard operating procedures that have been established.

Based on the description above, the authors are interested in conducting research with the title "Comparison of Urine Protein Examination Using Normal Heating Methods with 6% Acetic Acid Heating Method in Third Trimeste**6.** Pregnant Women at Kabila District Health Center. Bone Bolango ".

RESEARCH METHODOLOGY

This type of research is using comparative analytical research. This type of research is a comparative study conducted to compare the similarities and differences of two or more properties and facts of the object under study based on a certain frame of mind. The variables in this study were: The dependent variable studied was the urine protein of third trimester pregnant women who carried out the examination at the Kabila public health center and the independent variables studied were the urine protein examination method, namely the usual heating method and the 6% acetic acid method. The sampling technique in this study used the Non Probability Sampling method with the type of total sampling.

Work procedure urine protein examination using the usual heating method

1. Prepare tools and materials
2. Carry out urine sampling
3. Enter 2 ml of urine into the test tube
4. Heat over the bunsen using tube tongs
5. Watch urine if there is turbidity

Examination of urine protein using the 6% acetic acid method

1. Prepare tools and materials
2. Prepare 2 test tubes, then enter urine into the test tube up to 2/3 of the tube.
3. Heat the urine over the bunsen for 30 seconds
4. Watch for turbidity.
5. If turbidity occurs, add 3- 5 drops of 6% acetic acid solution. If the turbidity is lost, the turbidity is caused by calcium phosphate. If the turbidity is lost but forms gas, then the turbidity is caused by calcium carbonate. And if the turbidity persists or increases with the addition of 6% acetic acid, then the urine is positive for protein.

RESEARCH FINDINGS

The following are the results of the research that has been done.

Table 1.
Urine Protein Test Results

Kode Sampel	Pemeriksaan Protein *Urine*	
	Metode Pemanasan Biasa	Metode Asam Asetat 6%
01	-	-
02	+1	-
03	-	-
04	-	-
05	-	-
06	-	-
07	-	-
08	-	-
09	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-

Source: Data processed (2020)

Results from table 1. Examination of urine protein using the normal heating method obtained negative results (-) of 13 people and positive results + (+1) of 1 person. While the heating method of 6% acetic acid, as many as 14 people got negative results (-).

Table 2.
Frequency Distribution Based on Usual Heating Method and 6% Acetic Acid Heating Method

Hasil	Metode Pemanasan Biasa		Metode Pemanasan Asam Asetat 6%	
	N	%	N	%
Positif + (+1)	1	7.1	0	0
Negatif (-)	13	92.9	14	100
Total	14	100	14	100

Source: Data processed (2020)

In this study comparing the methods used in examining urine protein. The method that will be used is the conventional heating method and the heating method for 6% acetic acid.

The distribution of respondents based on the usual heating method with positive results + (+1) was 1 person with a percentage of 7.1% and negative results (-) as many as 13 people with a percentage of 92.1%. Whereas in the 6% acetic acid heating method, 14 people were obtained negative results with a percentage of 100%.

Table 3.
Wilcoxon test

Metode Pemeriksaan Protein *Urine*	Signifikan*(2-Tailed)*	Taraf Signifikasi	Keterangan
Eksperimen	0,317	0,05	Tidak Signifikan

Source: Data processed (2020)

In the Wilcoxon test, measuring the significance of the difference between 2 groups of paired data with an ordinal or interval scale but with an abnormal distribution of data, it is said that there is a significant difference if the significant value (2-Tailed) <significance level (5% or 0.05). Based on the table above, the results of the comparative analysis on the examination of urine protein using the ordinary heating method and the 6% acetic acid heating method are 0.317> 0.05, from the results obtained the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted.

DISCUSSION

Urine protein is a condition where there is a large amount of protein in the urine or exceeds normal limits. Examination of urine protein in pregnant women is very important to diagnose the occurrence of preeclampsia [12]. Preeclampsia is a condition that can be experienced by every pregnant woman characterized by increased blood pressure, followed by an increase in protein levels in the urine. In addition, preeclampsia is also characterized by swelling of the feet and hands [5] This swelling is due to the accumulation of water in the interstitial space due to water and salt retention causing weight gain and edema.

In this study, the urine protein was examined using the usual heating method with the heating method of 6% acetic acid in third trimester pregnant women at Kabila Health Center, Bone Bolango Regency by taking urine samples while on 14 trimester III pregnant women whose results were stated semiquantitatively.

In this urine protein examination using two methods, namely the ordinary heating method and the 6% heating method of acetic acid. Examination using these two methods was carried out by means of 3 test tubes filled with 2 ml of urine, the first tube was used as a control, the second tube was heated normally, while the third tube was heated then added 3-5 drops of 6% acetic acid.

This heating process aims to see the protein in a denatured state and precipitation occurs. Meanwhile, the addition of acetic acid aims to reach the isoelectric point of the protein. The precipitation process is assisted by salts that are already in the urine [9].

Each amino acid has a different isoelectric point. The isoelectric point is the time when the pH of the amino acids is in the amphoteric form (zwitter ion), and when this isoelectric point the solubility of the protein decreases and

reaches its lowest point, the protein will settle and coagulate. At this isoelectric point, the same number of cations and anions formed [14].

When the addition of 6% acetic acid, the turbidity is lost, then the turbidity is caused by calcium phosphate. If the turbidity is lost but forms gas, then the turbidity is caused by calcium carbonate. And if the turbidity persists or increases with the addition of 6% acetic acid, the urine is positive for protein [7].

Turbidity usually occurs due to crystallization or deposition of urate (in acidic urine) or phosphate (in alkaline urine). Turbidity can also be caused by excess cellular material or protein in the urine [11].

The 6% acetic acid heating method has the advantage that it is quite sensitive because as much as 0.004% protein can be expressed using this method, but there is a drawback, namely if the dilute urine which has a low density cannot be checked using this method because it causes false negatives [6] .

Based on the table, it is known that from 14 samples that were examined for urine protein using the normal heating method, 13 negative samples of urine protein were obtained with a percentage of 92.9% and a heating method of 6% acetic acid, 14 negative samples were obtained with a percentage of 100%. This shows that the results obtained from these two methods are much different. Because the urine is initially cloudy when you add acetic acid, 6% of the turbidity is lost. This shows that the turbidity is caused by the salts in the urine.

Based on table 4.4 the results of the Wilcoxon test analysis obtained a significant value of 0.317. This shows the results obtained are greater than the significant level. [13] the basis for the decision to accept or reject the hypothesis in the Wilcoxon sign rank test is that if the probability (Asymp.Sig) <0.05 then H0 is rejected, it means that there is a difference. If the probability (Asymp.Sig) > 0.05 then H0 is accepted, meaning that there is no difference. Based on the results obtained, the value of 0.317> 0.05, which means that H0 is accepted or there is no difference. So it can be concluded that the results of the analysis are not significant because there are differences in the results of the urine protein examination using the normal heating method with the 6% acetic acid heating method. The difference in the results of this analysis is because the number of samples used does not meet the Wilcoxon test requirements. Where the requirements of this test are the minimum ordinal data measurement scale, it does not require the assumption of normality and the sample size used in this test is more than 25 or 30. Because the larger the sample used or analyzed using the Wilcoxon test, the closer to normal data.

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