

DESCRIPTION OF THE RHEUMATOID FACTOR TEST IN WOMEN THE MENOPAUSE TO DETECT RHEUMATOID ARTHRITIS IN ULAPATO-A VILLAGE, GORONTALO DISTRICT

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ABSTRACT

Based on data from the Gorontalo provincial health office in 2017 the incidence of Rheumatoid Arthritis reached 14,391 the number of cases. Rheumatoid Arthritis is a chronic autoimmune inflammatory system disease whose cause is unknown. Symptoms of Rheumatoid Arthritis include experiencing stiffness in the joints in the morning, and swelling of the joints. This study aims to determine the results of Rheumatoid Arthritis test in menopausal women in Ulapato-A Village, Gorontalo District by examining Rheumatoid Factors.

This research is a quantitative descriptive study with a total of 34 samples. Using manual Rheumatoid Factor Check. This research was processed through the IBM SPSS Statistics V25.0 program. then presented in tabular form and reported as a percentage using the Frequency Distribution formula.

From the results obtained, 8 samples (23.5%) were positive while 26 samples (76.5%) were negative. In conclusion Rheumatoid factor in menopausal women is mostly negative. It is hoped that Rheumatoid Arthritis sufferers maintain their health by living a healthy lifestyle and doing light exercise and for other researchers to also carry out semi-quantitative follow-up examinations if they get a positive sample.

Keywords: rheumatoid arthritis, menopause, rheumatoid factors, reproduction, estrogen

INTRODUCTION

Menopause is the cessation of menstruation in women, so that the ovaries stop producing eggs. Menstrual activity decreases and eventually stops. The process of forming female hormones (estrogen and progesterone) decreases. This disease mostly affects women up to three to five times than men. The disease usually appears at the age of 25-50 years and peaks between the ages of 40 and 60 years [6].

Postmenopausal women tend to experience a decrease in hormones due to ovaries that no longer function. Which causes a decrease in all levels of

reproductive hormones in the body, including the hormone estrogen. The decrease in the hormone estrogen causes menopausal women to complain of muscle and joint pain, due to a lack of estrogen which causes damage to the collagen matrix and by itself the cartilage becomes damaged. Estrogen levels in the body are linked to the neurotransmitter dopamine, which affects emotions, the immune system, motivation and sexual behavior.

Menopause is divided into 3 phases, namely: first, the climaterium (premenopause), the climaterium period is an intermediate period between the

Description of Rheumatoid Factor Test in Menopausal Women to Detect Rheumatoid Arthritis in Ulapato-A Village, Gorontalo District

reproductive period and the senium period. Usually experienced by women aged between 40 years. Characterized by irregular menstrual cycles, long and relatively heavy menstrual bleeding. Second, Menopause, which is the time of the last menstruation or the cessation of menstruation. Generally menopause begins around age 50 and lasts 3-4 years. Psychological and physical changes and complaints are increasingly prominent. Third, it is also called the senium period. In this phase, women are able to adjust to their conditions so that they do not experience physical problems between the ages of 65. However, some women also experience changes in symptoms due to changes in hormonal balance.

According to Andriyani, in her research results, 80.5% of Rheumatoid Arthritis sufferers were female, because the higher the age of the woman, the greater the number of Rheumatoid Arthritis sufferers. This is influenced by the female hormone estrogen. The hormone estrogen affects autoimmune conditions. Autoimmune itself is a condition in which the immune system misunderstands and attacks the body's own tissues [1].

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The decrease in the hormone estrogen in the long term will interfere with the absorption of calcium which is needed in bone formation and maintain bone mass. Estrogen levels in the body are also linked to the neurotransmitter dopamine.

Dopamine affects emotions, the immune system, motivation and sexual behavior.

Rheumatoid Arthritis(RA) is an immune and autoimmune system disease that can cause chronic inflammation of the joints. Rheumatoid Arthritis (RA) can also cause autoimmune reactions when the synovial tissue involves phagocytosis and other inflammatory responses. In short, the joint abnormalities found in Rheumatoid Arthritis basically occur due to synovial cells that damage bone and cartilage. This disease begins with the activation of autoreactive T cells which then migrate into the synovial cavity and induces activation of effector cells such as synovial cells and B cells, through cytokines produced by T cells, the synovial membrane then becomes hypersellular due to the accumulation of large numbers of lymphocytes in various activation stage, plasma cells, and macrophages.

Joint inflammation is a characteristic feature of Rheumatoid Arthritis which can result in loss of shape and function of the joints leading to permanent damage to joint function. Patients cannot move freely because they suffer from stiffness and pain in the joints. In severe cases, Rheumatoid Arthritis can attack important organs, such as the eyes, lungs, and blood vessels. Symptoms of this disease are usually gradual, starting with joint pain and stiffness in the fingers, and then often accompanied by redness in the joints. Then there is swelling of the joints such as the hands, neck, shoulders, elbows, hips, knees and toes.

This disease has a tendency to damage cartilage, cause bone erosion, and cause joint damage. The hands and ankles are frequently affected. Pain that is exacerbated by movement is accompanied by swelling and tenderness. This disease often causes joint damage, and disability. Early diagnosis often faces obstacles because at an early age there is often no

picture of new characteristics that will develop over time when it is often too late to start adequate treatment.

Rheumatoid Arthritis can affect any joint; the small joints in the hands and feet tend to be involved most often. In Rheumatoid Arthritis, the stiffness is most often worst in the morning. This can last one to two hours or even throughout the day. Stiffness for a long time in the morning is a clue that a person may have Rheumatoid Arthritis, as few other Arthritis diseases behave this way. For example, osteoarthritis most often does not cause prolonged morning stiffness [5].

The cause of Rheumatoid Arthritis is not known with certainty, but predisposing factors are immunity mechanisms (antigen-antibody), metabolic factors, and viral infections. The causes of this disease include: Genetics, age, sex, obesity, and lifestyle [12].

The process of developing symptoms goes through 3 stages, namely the first stage, the synovial membrane is thickened, causing complaints of pain, heat and stiffness and swelling around the joints. The second stage is the cells in the joint area increase rapidly, so that the synovial membrane thickens. The third stage, joint inflammation secretes enzymes so that the bone and joint cartilage is destroyed until the shape and size of the joint changes, causing increased pain and limited joint movement.

Rheumatoid Arthritis usually affects the small joints in the hands and feet first. Some of the symptoms that often arise in joints due to Rheumatoid Arthritis, include: stiff joints, joint pain, restricted movement of any joints in the body, reddish color that appears in the painful joint area, a feeling of warmth from the painful joint, rash (rash) that appear in the joints, lumps and changes seen in the joints. Apart from the symptoms mentioned above, some people with Rheumatoid Arthritis can also experience

fever, weight loss, fatigue and lack of energy, sweating, and decreased appetite.

Rheumatoid factor (RF) is an antibody against the Fc refio in IgG. However, most of the Rheumatoid Factor (RF) is in the form of IgM. Rheumatoid factor (RF) is found in more than 70% of Rheumatoid Arthritis sufferers. However, Rheumatoid Factor (RF) was also found in a small percentage in healthy subjects and up to 20% in subjects over 65 years of age. The presence of Rheumatoid Factor (RF) indicates Rheumatoid Arthritis but is not a diagnosis. The role of auto antibodies in the pathogenesis of Rheumatoid Arthritis is still debated but a common finding in Rheumatoid Arthritis is the presence of IgM antibodies that react with the Fc IgG portion, which causes immune complexes to form. These anti-IgG antibodies are known as Rheumatoid Factor (RF). Deposition of these immune complexes in joints activates the classical complement pathway.

Antigen-antibody reactions are characterized by agglutination, in which the presence of ag in the form of particles / latex reacts with specific antibodies to form an agglutination reaction (clots).

The slide test of latex agglutination determining Rheumatoid factor in undiluted serum qualitatively and semi-quantitatively is characterized by the presence of agglutination.

According to the World Health Organization (WHO) in 2015, 165 million people in the world suffer from Rheumatoid Arthritis with a prevalence between 0.3-0.5% [15]. Rheumatoid Arthritis disease in the world of 2130 million population has reached 355 million, which means 1 in 6 people diagnosed with Rheumatoid Arthritis [10]. This figure is predicted to continue to increase until 2025 with an incidence of 25% experiencing paralysis.

In Indonesia the prevalence of the disease *Rheumatoid Arthritis* ranged from

Description of Rheumatoid Factor Test in Menopausal Women to Detect Rheumatoid Arthritis in Ulapato-A Village, Gorontalo District

0.2-0.5% [3]. From the diagnosis of health workers, it shows that the prevalence of Rheumatoid Arthritis in Indonesia is 11.9%, while the prevalence based on the interview results was 24.7% in 2013 [4]. In addition, data from the Gorontalo Province health office (2017), the incidence of Rheumatoid Arthritis in 2017 reached 14,391 cases [9].

Ulapato-A Village is one of the villages located in Telaga Biru sub-district which has four hamlets. Based on data obtained from the Ulapato-A village office, the number of menopausal women is 157 people. Based on interviews, menopausal women have complaints of pain and stiffness in the joints in the knees, ankles, and backs of the fingers symmetrically (right and left) which are symptoms of Rheumatoid Arthritis.

Based on the description above, it has been explained that menopausal women have more impact on the onset of Rheumatoid Arthritis, one of which is the Rheumatoid Factor examination, which makes researchers interested in conducting the Rheumatoid Factor test on menopausal women in Ulapato-A Village, District. Gorontalo.

RESEARCH METHODS

This type of research used by researchers is descriptive. Descriptive research is research conducted on a set of objects which usually aims to see the picture that occurs in a population. Research conducted to describe or describe the phenomena that occur in society. The reason for this research is that researchers want to see a picture of rheumatoid factor levels in menopausal women who are suspected of having rheumatoid arthritis.

This research design is descriptive quantitative which aims to describe or describe a phenomenon or event (one or more research variables) in depth and systematically in the form of quantitative

data (numbers) without looking for a relationship between research variables [7].

The research design used is a descriptive design that studies the incidence and distribution of diseases or problems related to health where the process includes subject selection, data collection techniques, data collection procedures and data analysis.

When this research was conducted in October 2020. Place The research was carried out in two different locations. Sampling The research was conducted in Ulapato-A Village, Gorontalo District, then the sample will be analyzed at the MM Dunda Limboto Hospital Laboratory. The research variables used are independent variables, namely Rheumatoid Factor.

Population is the whole research subject or object under study. The population in this study were menopausal women residing in Ulapato-A Village, Gorontalo District. The sample in the study amounted to 34 menopausal women in Ulapato-A Village, Kab. Gorontalo.

The sampling technique that will be carried out in this study uses purposive sampling, namely sampling using certain criteria:

1. Inclusion Criteria
 - a. Menopausal women are willing to be respondents.
 - b. Women in menopause phase (Age 55-60 years).
2. Exclusion Criteria
 - a. Respondents were not available when collecting data.
 - b. Pre-menopausal and post-menopausal women.

The number of respondents in this study was based on a sample size formula for estimating one population with a known number of respondents [8]. The number of menopausal women population is known to be 157. As follows:

Formula :

$$n = \frac{N Z_{2(1-P)}^2 P (1-P)}{(N-1) d^2 + Z_{2(1-P)}^2 P (1-P)}$$

$$\frac{157.196^2 \cdot 0.5 (1 - 0.5)}{(157 - 1) \cdot 0.15^2 + 1.96^2 \cdot 0.5 (1 - 0.5)}$$

$$\frac{301.44 \times 0.5}{3.51 + 0.96}$$

$$\frac{150.7}{4.47}$$

$$n = 34 \text{ sampel}$$

Information:

- N : Total population
- n : Number of samples
- $Z_{2(1-P)}$: Degree of magnetism (Usually 95% = 1.96)
- P: The proportion of a particular case to the population, if the proportion is not known, it is set as 50% = 0.05)
- D : Degree of deviation from the desired population or desired error rate (15% = 0.15) (10% = 0.10), (5% = 0, 05), or (1% = 0.01)

Data collection techniques in this study using a questionnaire. The questionnaire is a data collection technique where the researcher will give a number of questions in writing to be answered by the respondent [10]. The tools used in this research are Red Cap Tube, Centrifuge, Holder, Disposable, Torniquet, Micropipette, Dropper Pipette and Slide. The materials used in this study were as follows: KIT LR (Latex Reagent), Serum Sample, 70% Alcohol Cotton, Dry Cotton, and positive and negative control reagents.

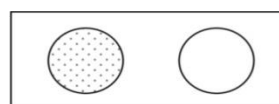
Procedure:

- a. Place samples and controls on slide appropriately

	Sample	Positive control	Negative control
Samples / Control	50µl	50µl	50µl

- b. Drop 50 µl of the latex reagent next to each drop of the sample or control.
- c. Mix and flatten until it meets the test circle.
- d. Play the slide for 2 minutes and see any agglutination

Reading of Results



A B

- A: Positive reaction when agglutination occurs
- B: Negative reaction when the mixture is cloudy like milk.

If doubtful results occur on examination, they are repeated and compared with positive and negative controls.

Data Analysis Techniques using univariate data analysis techniques. Univariate is a data analysis technique for a variable and each variable is analyzed that cannot be associated with other variables. The purpose of univariate analysis is to explain the characteristics of each research variable [8]. Data presented in tabular form and reported as a percentage using the following formula:

$$P = \frac{f}{N} \times 100\%$$

Information :

- P = Percentage
- F = Frequency / number of samples whose RF levels are abnormal
- N = The total number of samples
- 100% = Fixed number

RESEARCH RESULT

Before conducting an inspection, a control check is carried out first. The results of

Description of Rheumatoid Factor Test in Menopausal Women to Detect Rheumatoid Arthritis in Ulapato-A Village, Gorontalo District

the control check can be seen in the table below

Table 1 Control examination result data

Examination	Result
Positive Control	Reactive
Negative Control	Non Reactive

Source: Data obtained, 2020

After that, 34 samples of menopausal women were examined. The results of the study after examining 34 samples of menopausal women in Ulapato-A Village, Gorontalo District

Table 2 Data on RF Examination Results on Menopausal Women in Ulapato-A Village, Gorontalo District.

Result	Frequency	Percent
Positive	8 Samples	23.5%
Negative	26 Samples	76.5%
Total	34 Samples	100%

Source: Data processed, 2020

Based on the table data about the Rheumatoid Factor (RF) Test Results in Menopausal Women with a frequency of 34 samples where negative results were obtained with a total frequency of 26 people (76.5%) and negative results with a total frequency of 8 people (23.5%).

DISCUSSION

Rheumatoid Arthritis a rheumatic disease caused by an autoimmune process that requires special attention in its management because it often causes disability and even premature death so that it will have quite a serious impact. This disease is usually more common in women, especially of productive age.

Physiology of menopause is the number of follicles in the ovaries at birth that have about 750,000 oocytes in both ovaries, 1/3 of which are lost before puberty and most of the rest are lost before reproduction. In each menstrual cycle, 20-30 primordial follicles are in the

process of development and most of them experience atresia. During the reproductive period, about 400 oocytes undergo a process of maturation and most of them disappear spontaneously due to increasing age. At menopause only a few thousand. Also reduced estrogen production. The remaining follicles are more resistant to gonadotropin stimulation, so that the ovarian cycle consisting of follicle growth, ovulation and the formation of the corpus luteum slowly stops. Continuous loss of follicles after birth,

Menopause is the time when a woman's menstruation stops at 45 to 50 years permanently that occurs after the loss of ovarian activity. The year before menopause that includes a change from the normal ovulatory cycle to cessation of menstruation is known as the perimenopausal transitional year which is characterized by menstrual cycle irregularities.

Risk factors for the onset of Rheumatoid Arthritis are seen from age, of all risk factors for the onset of Rheumatoid Arthritis, age is the strongest factor. The prevalence and severity of Rheumatoid Arthritis increases with age. Second, Gender is a risk factor for Rheumatoid Arthritis. Women are more prone to getting Rheumatoid Arthritis than men. In terms of gender, most Rheumatoid Arthritis sufferers are mostly women. This is because Rheumatoid Arthritis appears at a later age and women generally live longer. Women are more likely to be at risk of chronic complications. Third, Genetics Hereditary factors also play a role in the onset of Rheumatoid Arthritis. For example, in the mother of a woman with Rheumatoid Arthritis of the distal inter phalanx joints there are twice as often in these joints, and daughters tend to have three times as often as mothers and daughters of women without Rheumatoid. Arthritis.

Furthermore, Obesity (Overweight) Excessive body weight is significantly associated with an increased risk of developing Rheumatoid Arthritis in both women and men. Obesity is not only associated with Rheumatoid Arthritis in the joints that bear weight, but also with Rheumatoid Arthritis of other joints (hand or sternoclavicular).

The next risk factor is activity, patients with very advanced age really need more attention, because when a patient with a body condition that no longer allows for much movement, it will be aggravating for the patient's condition to decline, even more so with a very poor immune system. So that patients with a decreased immune system need more attention to reduce/ pay attention to the type of activity/ excessive mobility. This is because the strength of the patient's skeletal musculoskeletal system, which is no longer like his age a few years ago, is still able to perform optimally.

And environmental factors, those who are diagnosed with Rheumatoid Arthritis really need more attention about a very supportive environment. When the surrounding environment is not supportive, the client will likely feel the symptoms of this disease. Many of them when the condition of the environment around the patient is cold enough, the sufferer will feel pain, joint stiffness in the areas that are usually exposed, difficult to mobilize, and even paralysis.

Based on research that has been carried out on 34 blood samples contained in table 1, the results of control checks on Rheumatoid Factor (RF), namely the positive control (reactive) and the negative control (non reactive). A control check is performed to function as a comparison of the results to see if there is agglutination in the sample to be examined. Then in table 2, namely the Rheumatoid Factor examination results with a total sample of 34 menopausal women, 8 people (23.5%) were positive

and 26 people (76.5%) showed negative results.

In the criteria of 8 samples that are reactive to Rheumatoid Factor (RF) the patient has swelling in the joints and often experiences joint stiffness in the morning which lasts for several minutes and makes the patient easily tired. The 26 samples were non-reactive to Rheumatoid Factor (RF), because the patients did not experience symptoms of Rheumatoid Arthritis such as stiffness in the joints. Then there are some patients who experience symptoms of Rheumatoid Arthritis (stiff joints) but the results of the Rheumatoid Factor (RF) examination are non-reactive. This is because these symptoms usually occur due to other diseases such as gout which have almost the same symptoms as Rheumatoid Arthritis.

The reactive results on Rheumatoid Factor (RF) are caused by the presence of IgM antibodies which then react with Fc IgG causing the formation of immune complexes. Rheumatoid factor (RF) is found in more than 70% of Rheumatoid Arthritis sufferers because of the presence of IgG antibodies.

The principle of Rheumatoid Factor (RF) examination is the Rheumatoid Factor reaction which is based on the immunological reactions associated with IgG latex and Rheumatoid Factor in the patient's serum. And agglutination will form if the serum contains Rheumatoid Factor (RF).

Another study stated that 66.7% of Rheumatoid Arthritis sufferers were menopausal women [2]. Meanwhile, the research found that only 23.5% of menopausal women were sufferers of Rheumatoid Arthritis. Judging from the large difference in results, it can be shown that half of Rheumatoid Arthritis sufferers (66.7%) are menopausal women, but only a few (12%) menopausal women suffer from Rheumatoid Arthritis. This can

Description of Rheumatoid Factor Test in Menopausal Women to Detect Rheumatoid Arthritis in Ulapato-A Village, Gorontalo District

indicate that the older a woman is, the more she is at risk of developing autoimmune Rheumatoid Arthritis. However, although the results of the Rheumatoid Factor (RF) test positive in menopausal women were less than previous studies.

The finding of differences in results according to researchers was due to differences in research locations from the previous one. Based on the theory, environmental factors are one of the causes of autoimmune diseases. The previous research location was in a rural area, while the current research location is in an area close to urban areas, thus enabling the people in the research location to be more aware of their health. Environmental factors also include environmental cleanliness and air that is free from pollution and cigarette smoke. Then the difference in results was also found in a person's physical activity. Those who are positive for Rheumatoid Factor (RF) admit that they rarely have sufficient physical activity. Because Rheumatoid Arthritis is an autoimmune disease that attacks the joints, it is necessary to carry out sufficient joint movement because if the joint is rarely moved it will make the joint stiff and inflamed. In addition, differences in results are also influenced by factors of good immunity. basically the body's immunity against infection decreases, including the speed of the immune response. Because when you reach old age, the risk of suffering from a disease will increase. Based on the theory there is a drastic hormonal change at menopause that affects immunity. Because when you reach old age, the risk of suffering from a disease will increase. Based on the theory there is a drastic

hormonal change at menopause that affects immunity.

CONCLUSION

Based on the results of the research conducted, it can be concluded that:

1. Rheumatoid factor test results for menopausal women in Ulapato-A Village, Gorontalo District were 23.5% positive and 76.5% negative.
2. The serum of patients with suspected Rheumatoid Arthritis in menopausal women was not too dominant to give positive results on the Rheumatoid Arthritis examination.

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