Correlation of Age and Genetic with Gout Arthritis: A Cross-Sectional Study

1st Feti Kumala Dewi

Faculty of Health
Harapan Bangsa University
Purwokerto, Indonesia
fetikumala@uhb.ac.id

2nd Susilo Rini

Faculty of Health
Harapan Bangsa University
Purwokerto, Indonesia
susilorini@uhb.ac.id

Abstract— **Unchangeable risk factors such as family history, genetic, age and sex. Risk factors that can be changed and affect the incidence of hyperuricemia are obesity, food and alcohol intake, drug consumption, kidney disorders and hypertension. The purpose of the study was to analyze the correlation of obesity and hypertension with Gout Arthritis. This study was a cross sectional study. The sampling technique used in this study was accidental sampling, the sample of this study were 157 people in Posbindu (Integrated development post), Bina Keluaga Lansia (Elderly foster care), and Bina Keluarga Remaja (Training post for parents to educate children) at Toyareka, Kemangkon, Purbalingga. The research data are primary data from interviews and examination of uric acid levels. The research instrument was an examination of uric acid (questionnaire) and questionnaires about age and genetic. Analysis was carried out by bivariant (chi square) test. The results of the study were the relationship of obesity with gout arthritis with chi square results p = 0.003. There is a relationship between hypertension and gout arthritis with chi square results p = 0.029.**

Keywords: **age, genetics, arthritis gout**

INTRODUCTION

The results of the 2018 Riskesdas (Basic Health Research) showed that the prevalence of non-communicable diseases had increased when compared to the 2013 Riskesdas, including cancer, stroke, chronic kidney disease, diabetes mellitus, and hypertension. The Head of the Health Research and Development Agency, Siswanto, explained that the prevalence of cancer rose from 1.4 percent (Riskesdas 2013) to 1.8% in 2018 with the highest prevalence in DI Yogyakarta Province [1].

Factors affecting uric acid levels are classified into three: Primary factors, secondary factors and predisposing factors. Primary factors are influenced by genetic factors. Secondary factors can be caused by two things, namely excessive uric acid production and decreased uric acid excretion. Predisposing factors are influenced by age, sex, and climate. Secondary factors can develop with other diseases (obesity, diabetes mellitus, hypertension, polycythemia, leukemia, myeloma, sickle cell anemia and kidney disease) [2]. Risk factors that cause people to get gout are genetic / family history, excessive intake of purine compounds, excessive alcohol consumption, obesity, hypertension, impaired kidney function and certain drugs

(especially diuretics). These factors can increase uric acid levels. when there is an increase in uric acid levels showing signs such as pain in the joints with pain, redness and swelling, this condition is known as gout. Gout is a disease that can be controlled though it cannot be cured, but when this circumstance is left, it can develop into a crippling arthritis. Gout has the potential to cause kidney stone infections, hypertension and other heart diseases [3]. Currently the exact occurrence of Gout Arthritis in the community is still unclear. The study of Arthritis Gout conducted in the hospital showed a higher prevalence rate of 17-28% due to the influence of diseases and drugs taken by patients. The prevalence of Arthritis Gout in Central Java was 24.3% in males and 11.7% in females [1]. In a study of 8,342 people conducted for 9 years, the cumulative incidence was 4%, namely 5% in men and 3% in women. The prevalence of Arthritis Gout varies in each age group and increased at age 30 in men and 50 in women. The incidence of

Arthritis Gout is caused by various factors such as genetics, age, gender, excess weight and diet [3].

METHODOLOGY

In this study the total population were 157 people in Posbindu, Bina Keluarga Lansia and Bina Keluarga Remaja Toyareka, Kemangkon, Purbalingga. Sampling technique used was accidental sampling with a non-probability sampling technique in which subjects are chosen because of chance. The samples taken from this study were 157 people in Posbindu, Bina Keluarga Lansia and Bina Keluarga Remaja at Toyareka, Kemangkon, Purbalingga. The data analysis used in this study was bivariant analysis using the chi square test because data included nominal/categorical.

RESULTS AND DISCUSSION

Correlation of Age with Gout Arthritis
Table 1. Age Correlation with Gout

| | | | Arthritis Gout | | Total | $\square$ |
			Experiencing Gout Arthritis	Not Experiencing Gout Arthritis		
Age	<50 years old	F	18	63	81	$\square$:0.03
		%	11.5	40.1	51.6	
	>50 years old	F	34	42	76	
		%	21.7	26.8	48.4	
Total		F	52	105	157	
		%	33.1	66.9	100	

Based on table 1 with the results of chi square p = 0,003, then there is a correlation of age with Gout Arthritis in Toyareka ,Kemangkon, Purbalingga with age >50 years experiencing Arthritis Gout is 34 people (21,7%).

Factors affecting uric acid levels are classified into three: Primary factors, secondary factors and predisposing factors. Primary factors are influenced by genetic factors. Secondary factors can be caused by two things, namely excessive uric acid production and decreased uric acid excretion. Predisposing factors are influenced by age, sex, and climate. Secondary factors can develop with other diseases (obesity, diabetes mellitus, hypertension, polycythemia, leukemia, myeloma, sickle cell anemia and kidney disease) [2]. Risk factors that cause people to get gout, are genetic / family history, excessive intake of purine compounds, excessive alcohol consumption, obesity (obesity), hypertension, impaired kidney function and certain drugs (especially diuretics). These factors can increase uric acid levels, if there is an increase in uric acid levels with signs of rheumatic pain in the joints, with redness and swelling, this condition is known as gout [4]. Gout is a disease that can be controlled even though it cannot be cured, but if it is left, this condition can develop into a crippling arthritis. Gout has the potential to cause kidney stone infections, hypertension and other heart diseases [5].

The results of this research are in line with the research of Fadilah and Sucipto in 2018 with the analysis results of age compared to uric acid levels, it was obtained p value of 0,000, more uric acid was found in the early adult age range (26-35 years), the higher the age, the more abnormal the uric acid levels. Adults have a greater risk of degenerative diseases compared to youngsters. This is because the tissues of the body are worn out or because of accumulation of substances that harm the body. One of the diseases that often attacks adults is gout [3].

The risk factor with highest prevalence in Indonesia are people in coastal areas, due to habits or seafood eating patterns as the consumption of seafood mainly fish causes Gout. In addition, age is also a risk factor to note, hyperuricemia is more common in men than women. This is related to gout in men who tend to increase after age.

Meanwhile in women, 98% will experience gout after menopause, the elderly aged> 60 years have a risk of 29 times experiencing Gout Arthritis than that of the elderly aged <60 years [6].

Genetic correlation with Gout Arthritis
Table 2. Genetic correlation with Gout.

			Arthritis Gout		Total	□
			Experiencing Gout Arthritis	Not Experiencing Gout Arthritis		
Genetic	There is a family history	F	20	23	43	□:0,029
		%	12.7	14.6	27.4	
	No family history	F	32	82	114	
		%	20.4	52.2	72.6	
Total		F	52	105	157	
		%	33.1	66.9	100	

Based on table 2 with the results of chi square p = 0,0029, there is a correlation of genetic with Gout Arthritis in Toyareka, Kemangkon, Purbalingga. It shows 20,4% (32 people) with genetic experienced Arthritis Gout.

Gout is included in the category of diseases with unknown clinical cause. So far, it was assumed that gout is closely related to genetic and hormonal factors. Gout can also be found in people with genetic factors that lack hypoxanthine guanine phosphoribosyl. This is what becomes the body's metabolic abnormalities which causes gout to increase dramatically [7].

The result of this study was in line with Abiyoga's research in 2017 that there was correlation between family history and the incidence of gout (p-value = 0.00) [8]. Elderly people who have family history of gout and suffer from it were greater than respondents who did not have it. When interview session, some respondents said that in their families there was a gout family history [9]. Genetic factors can contribute to the high prevalence of hyperuricemia in certain ethnic groups. Gout can be suffered due to genetic factors. This is because the gene factor derived from parents who also suffer from gout genetically inherited from its predecessor. Genetic factors in patients with gout usually begin with a disorder of purine metabolism which causes excessive gout in the blood. The SLC2A9 genetic variant can contribute to gout vulnerability among Malaysian in Malaysia [10].

The history of gout in one's family tree can be a risk factor of gout. Gout is caused by genetics called primary gout. This gout occurs due to the absence of the hypocanthineguanine phosphoribosyl transferase enzyme which causes increased purine synthesis. Genetic factors that can cause interference with glycogen storage or deficiency of digestive enzymes causes the body to produce more lactate compounds or triglycerides that compete with uric acid to be removed by the kidneys. 18% of gout sufferers have a family history of hyperuricemia, and the occurrence of gout tends to increase when uric acid levels increase [9].

IMPLICATION FOR PRACTICE

This research is expected to provide input to increase the knowledge, insights, and experiences of researchers in the field of reproductive health, especially about noncommunicable diseases (Arthritis Gout). It also provides recommendations for other studies to examine other variables beyond this research, so that new concepts can be formulated in research methods.

STRENGTH AND LIMITATION

Strength in this research is that there were 157 samples, so it is expected that the data will be more valid. The limitation of this study was that there were respondents aged 60-75 years old. So that during the examination, the researcher needed to approach and communicate well and carefully and explain the procedure so that the respondent understood the actions taken.

CONCLUSIONS

 The results of the study were that there was relationship between age and gout arthritis with chi square results p = 0,003. There was a relationship between genetic and gout arthritis with chi square results p = 0.0029. Respondents with arthritis gout are expected to be able to do a good treatment by checking their healthcare provider for routine screening every 6 months, apply a healthy lifestyle by consuming balanced nutrition and regular exercise so that the effects of gout arthritis can be avoided

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