

# Correlation Between Obesity and Hypertension with Gout Arthritis: A Cross-Sectional Study

1st Feti Kumala Dewi

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

2<sup>nd</sup> Susilo Rini

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

**Abstract**— Gout is also associated with various diseases such as hypertension, cardiovascular disease, diabetes mellitus and other types of metabolic diseases. The mechanism of the occurrence of Arthritis Gout in metabolic diseases is due to increased kidney workload. Gout Arthritis is also related to hypertension and obesity. This study aims to analyze the correlation of obesity and hypertension with Gout Arthritis. This is 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 Keluarga 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 obtained from interviews and examination of uric acid levels. The research instrument used were measurement tool of uric acid (nesco) and questionnaires about hypertension and obesity. Analysis was carried out by bivariate (chi square) test. The results of the study showed the correlation between obesity and gout arthritis with chi square results  $p = 0.000$ . Therefore, there is a relationship between hypertension and gout arthritis with chi square results  $p = 0.007$ .

which reduces vein excretion due to glomerular artery damage and glomerulosclerosis [2].

Similarly, the prevalence of stroke went up from 7% to 10.9%, while chronic kidney disease rose from 2% to 3.8%.

Based on examination of blood sugar, the prevalence of diabetes mellitus increased from 6.9% to 8.5%; and the results of blood pressure measurements, hypertension went up from 25.8% to 34.1% [1].

Obesity has a role in the occurrence of Gout Arthritis in people with obesity, adipose accumulation will occur which will eventually lead to increased uric acid production and decreased uric acid excretion [3]. Gout is also related to various diseases

**Keywords:** *obesity, hypertension, gout arthritis*

## INTRODUCTION

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

Body mass index (BMI) and hypertension have been identified as risk factors for gout incidence in a number of large epidemiological studies. Obesity increases insulin resistance, which reduces renal excretion and leads in hyperuremia. Hypertension is gout predisposition

such as hypertension, cardiovascular disease, diabetes mellitus and any other types of metabolic diseases. The mechanism of the occurrence of Arthritis Gout in metabolic diseases is due to increased kidney workload in long time which leads kidney fatigue and decreases the work of the kidneys which further causes decreases uric acid excretion [4].

Currently the exact occurrence of Gout Arthritis in the community is still unclear. In the study of Arthritis Gout in the hospital, it has been found higher prevalence rate of 1728% due to the influence of diseases and drugs taken by patients. The prevalence of Arthritis Gout in residents in Central Java was 24.3% in males and 11.7% in females [1].

In a study conducted by Astuti and Tjahjono (2018), based on 8,342 people studied for 9 years, the cumulative incidence was 4%, namely 5% in men and 3% in women. The prevalence of Arthritis Gout varied in each age group and

increased at the age 30 in men and 50 in women. The incidence of Arthritis Gout is caused by various factors such as genetics, age, gender, excessive weight and diet [5]. The purpose of the study was to analyze the correlation of obesity and hypertension with Gout Arthritis.

**METHODOLOGY**

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

**RESULTS AND DISCUSSION**

**Correlation of Obesity with Arthritis Gout.**

Table 1. Correlation of obesity with Gout.

		Arthritis Gout		Total	χ <sup>2</sup>
		Experiencing Gout Arthritis	Not Experiencing Gout Arthritis		
Obesity	Not obese	F	22	80	0.000
		%	14	51	
	Obesity	F	30	25	
		%	19.1	15	
Total	F	52	105	157	
	%	33.1	66.9	100	

Based on table 1 with the results of chi square  $p = 0,000$ , then there is a correlation of obesity with Gout in Toyareka, Kemangkon, Purbalingga which shows the highest number of obesity experiencing Arthritis Gout of 30 people (19.1%).

The increasing prevalence of gout throughout the world urges an improvement effort to detect hyperuricemia earlier. So that it can prevent the occurrence of Gout or can detect patients earlier before more severe clinical manifestations appear. Lifestyle modifications, including weight loss, dietary changes, hypertension control and changes in treatment regimens can provide adequate control of hyperuricemia prior to the occurrence of clinical manifestations of hyperuricemia [6].

The consumption of meat and seafood is associated with an increased risk of gout, while consumption of low-fat dairy products will reduce uric acid levels due to the uricosuric effect in milk protein. The Body Mass Index (BMI) is significantly associated with the risk of gout compared to people with a normal body mass index[7].

The results of the study with the results of  $p: 0.000$  was in line with the research conducted [8] with the result that there was a significant correlation between nutritional status and blood uric acid levels in the elderly ( $\chi^2 = 0.002$ ). Uric acid levels will increase in line with the increase in body weight besides uric acid levels in obese patients was significantly higher than that of in people with malnutrition. As a comparison, the prevalence of increasing uric acid levels in nutritional people is more than 2.98 times more than people with malnutrition and in obese people it is 5.96 times more than people with malnutrition [9]. Gout is 2.2 times more likely to occur in individuals with a body mass index  $\geq 30$  kg / m<sup>2</sup> [2].

Obesity is one of the risk factors of hyperuricemia. Obesity is defined as a condition in which excessive body fat occurs. In obese people there is an increase in uric acid mainly due to an increase in body fat, besides that it is also associated with body surface area so that fat people will produce more tendons than that of thin people [4].

High uric acid levels can be caused by consumption of foods with high purine content and excessive nutritional status can cause an increased incidence of gout [10]. Gout sufferers usually complain of symptoms of severe, swollen and rapid pain, more often encountered on the toe for the acute stage. In chronic symptoms, tofi is found in the tissues of the ears, base of the fingers and toes [11].

Correlation of hypertension with Arthritis Gout.  
Table 2. Correlation of hypertension with Gout.

		Arthritis Gout			Total	χ <sup>2</sup>
		Experiencing Gout Arthritis	Not Experiencing Gout Arthritis			
Hypertension	Hypertension	F	14	52	66	0.007
		%	8.9	33.1	42	
No hypertension	No hypertension	F	38	53	91	
		%	24.2	33.8	58	
Total		F	105		157	
		%	52	66.9	66.9	

Based on table 2 with the results of chi square  $p = 0.007$ , then there is a correlation of hypertension with Gout in Toyareka, Kemangkon, Purbalingga with hypertension experiencing Gout Arthritis of 14 people (8.9%).

The results of the Riskesdas 2018 showed that the prevalence of non-communicable diseases had increased when compared to the Riskesdas 2013, 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% (Riskesdas 2013) to 1.8% in 2018 with the highest prevalence in DI Yogyakarta Province[1].

The most important factor in the pathogenesis of arthritis gout is hyperuricemia. Hyperuricemia is a condition in which serum uric acid levels increase above normal. Uric acid levels  $> 7 \text{ mg / dl}$  in men and  $> 6 \text{ mg / dl}$  in women are used as a limitation of hyperuricemia[12]. Risk factors of hyperuricemia and gout arise as a result of an interaction between irreversible risk factors and changeable risk factors. Risk factors that cannot be changed include: family history, genetic, age and sex. Changeable risk factors that influence the incidence of hyperuricemia are obesity, food and alcohol intake, drug consumption, kidney disorders and hypertension [13].

Similarly, the prevalence of stroke went up from 7% to 10.9%, while chronic kidney disease rose from 2% to 3.8%. Based on examination of blood sugar, the prevalence of diabetes mellitus rose from 6.9% to 8.5%; and the results of blood pressure measurements, hypertension rose from 25.8% to 34.1% [1].

The results of this study are in line with the 2015 Eso, Hamra, and Ahmadi studies with  $p: 0,000$ . Hypertension was determined based on systolic blood pressure  $\geq 140 \text{ mmHg}$  or diastolic blood pressure  $\geq 90 \text{ mmHg}$ . Hyperuricemia with hypertension, hypertension will end in microvascular disease with the end result in tissue ischemia which will increase uric acid synthesis through degradation of ATP into adenine and xanthine[14]. Other researchers concluded that an increase in blood pressure will cause ischemia. Long-lasting hyperuricemia can cause chronic kidney disease with tubular changes. Hypertensive individuals were 1.64 (1.34-2.01) and 2.11 (1.64-2.72) times more likely to develop gout as a normotensive individual [2].

#### 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 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 are 157 samples, so it is expected that the data will be more valid. The limitation in this study is that there are respondents whose age is 60-75 years old so that at the time of the examination it is necessary to approach and communicate so that the respondent understands the actions taken.

#### CONCLUSIONS

The results of the study were the relationship of obesity with gout arthritis with chi square results  $p = 0,000$ . There is a relationship between hypertension and gout arthritis with chi square results  $p = 0.007$ .

For respondents should be able to increase information and insight about the prevention of gout arthritis so that they can be better prepared to deal with changes that occur when they are elderly and can prevent the occurrence of dysfunction in the body affected by gout arthritis.

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