CHARACTERISTICS AND PHYSICAL ACTIVITY WITH INCIDENCE OF OSTEOARTHRITIS IN HOSPITAL

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ABSTRACT

The Foundation (2013) estimates that 27 million people in the United States have symptoms of osteoarthritis. Indonesia based on the diagnosis of health workers by 24.7%. The data of medical record of Dr M.Djamil Padang in 2015 were 646 cases, increasing to 1323 cases in 2016.The purpose of this study was to determine the relationship between characteristics and physical activity with incidence of osteoarthritis in hospital Dr. m. Djamil padang. Type of this research is descriptive analytic with cross sectional approach uses that have been implemented was Dr. m. Djamil padang. The population of the research was all over patients who seek treatment on Poly Clinic Reumatologi with samples as many as 84 people and purposive sampling technique. Data analysis done in the univariate analysis displayed with frequency distribution analysis and bivariat use statistical test of Chi-Square. The results of this research are known as age with p value (0.000), gender with p value (0.001), physical activity with p value (0.000). There was a relationship between characteristics and physical activity with incidence of osteoarthritis.

Keywords: Age, Gender, Physical Activity, Osteoarthitis

INTRODUCTION

Osteoarthritis is a disease characterized by joint functional disorders including the degradation of cartilages, ligaments, synovial inflammation and progressive changes in bone structure (Bijlsma et al., 2011). The disease process affects not only cartilage but also joints, including chondral bones, ligaments, joint capsules and synovial and perisrticular connective tissue. In an advanced stage, the joints are prone to damage which is indicated by the presence of deep fibration, fissure, and ulceration on the surface of the joints (Indonesian Rheumatology association, 2014). The knee is the joint most often affected by osteoarthritis of the many joints that can be attacked by osteoarthritis (Carlos, 2013). The prevalence of osteoarthritis varies in different populations, however, osteoarthritis is a universal problem. The figure is even higher in the United States and Europe. According to the Arthritis Foundation (2013) estimates, 27 million people in the United States experience symptoms of osteoarthritis (Ignatavicius and Workman, 2015). The number of individuals affected by osteoarthritis is expected to continue to increase as the population ages (Guglielmi, Peh, and Guermazi, 2013).

In Indonesia, osteoarthritis cases are joined to joint diseases, including 10 non-communicable diseases suffered by the community with a prevalence based on the diagnosis of health workers in Indonesia of 11.9% and based on diagnosis or symptoms of 24.7% (Riskesdas, 2013). The prevalence of osteoarthritis in West Sumatra, based on diagnosis by health workers is 21.8% and based on diagnosis or symptoms 12.7% (Riskesdas, 2013). The prevalence of osteoarthritis in West Sumatra, osteoarthritis is 33%, including 11 provinces that have a

prevalence of joint disease above the national presentation, namely 30.3%. (Riskesda 2013), while in the city of Padang it has increased where the prevalence in 2015 was 10,244%, increasing to 10,994% in 2016 (Health Profile of Padang City, 2016).

Indonesian Rheumatology Association (2014) osteoarthritis is a slow progressive disease, with an unknown etiology. There are several risk factors that can cause osteoarthritis, namely age, gender, body weight, muscle weakness, heredity suffering from osteoarthritis and mechanical factors, trauma to the previous joint, excessive physical activity. Osteoarthritis almost never occurs in children and often over 60 years of age due to the aging process. In the aging process there are changes in collagen and proteoglycans which reduce the tension of joint cartilage and also due to a reduced supply of nutrients for cartilage (Lozada, 2013). Gender also contributes to the incidence of osteoathritis. This disease affects both sexes although it is more common in women (Heidari, 2011). Physical activity and strenuous and repetitive exercise that is physically demanding for a person can increase the risk of osteoarthritis

Based on data at RSUP Dr. M. Djamil Padang, osteoarthritis cases also experienced a significant increase, where cases in 2015 were 646 cases, increasing to 1323 cases in 2016 (Medical Record, 2016). Based on a preliminary survey conducted by researchers on June 2, 2017 at the Rheumatology Clinic Dr. M. Djamil Padang, data obtained from 10 osteoarthritis patients, namely 70% of respondents aged ≥ 60 years, 40% male gender. 70% are obese, while 60% of work / physical activity is low activity respondents.

MATERIAL AND METHODS

Type of this research is descriptive analytic with cross sectional approach uses that have been implemented was Dr. m. Djamil padang. The population of the research was all over patients who seek treatment on Poly Clinic Reumatologi for 1 month (September 2017) with samples as many as 84 people and purposive sampling technique. Data were collected by questionnaires and medical record. Data analysis done in the univariate analysis displayed with frequency distribution analysis and bivariat use statistical test of Chi-Square. Independent variables was characteristic (age, sex) and physical activity, and dependent variable was incidence osteoarthritis. Data was presented in tables and narrative texts.

RESULTS

Table 1 it can be seen that of the 84 respondents there were less than half (47.6%) of respondents with osteoarthritis incidence at the Dr. M. Djamil Padang hospital. Table 2, it can be seen that there were more than half of the 8 respondents (56.0%) of respondents aged <60 years. Table 3, it can be seen that 84 respondents, there are more than half (57.1%) of respondents with the female gender in the Dr. M. Djamil Padang hospital. Table 4, it can be seen that 84 respondents, there are more than half (54.8%) of respondents who have low physical activity, while as many (11.9%) of respondents have high activity at the Dr. M. Djamil Padang hospital.

The Chi Square test, it was found that age is a p value = 0.000,it means that there is a relationship between age and the incidence of osteoarthritis in table 5. Gender is a p value = 0.001, this means that there is a gender relationship with the incidence of osteoarthritis in table 6. And physical activity is a p = 0.000. This means that there is a relationship between physical activity and the incidence of osteoarthritis in the Dr. M. Djamil Padang hospital in table 7.

Table 1. Frequency Distribution of Respondents Based on the Incidence of Osteoarthritis in Dr. M. Djamil Padang Hospital

No	Incidence *Osteoarthritis*	*f*	Percentage
1	No *Osteoarthritis*	44	52,4
2	*Osteoarthritis*	40	47,6
	Total	**84**	**100**

Table 2. Frequency Distribution of Respondents Based on the Incidence of Osteoarthritis in Dr. M. Djamil Padang Hospital

No	Age	*f*	Percentage
1	< 60 tahun	47	56.0
2	> 60 tahun	37	44.0
	Total	**84**	**100**

Table 3. Frequency Distribution of Respondents Based on the Incidence of Osteoarthritis in Dr. M. Djamil Padang Hospital

No	Gender	*f*	Percentage
1	Male	36	42,4
2	Female	48	57,1
	Total	**84**	**100**

Table 4. Frequency Distribution of Respondents Based on the Incidence of Osteoarthritis in Dr. M. Djamil Padang Hospital

No	Physical Activity	*f*	Percentage
1	Low	46	54.8
2	Medium	28	33.3
3	Height	10	11.9
	Total	84	100

Table 5. Relationship between Age and the Incidence of Osteoarthritis in Dr. M. Djamil Padang Hospital

No	Age	Incidence *Osteoarthritis*				Total	*P* value
		No *Osteoarthritis*		*Osteoarthritis*			
		f	%	*f*	%		
1	< 60 year	38	80.9	8	19.1	47	0.000
2	≥60 year	6	16,2	31	83,8	37	
	Total	**44**	**52.4**	**40**	**47,1**	**100**	

Table 6. Relationship between Gender and the Incidence of Osteoarthritis in Dr. M. Djamil Padang Hospital

No	Gender	Incidence *Osteoarthritis*				Total	*P* value
		No *Osteoarthritis*		*Osteoarthritis*			
		f	%	*F*	%		
1	Male	27	75,0	9	25,0	36	0.001

2	Female	17	35.4	31	64.6	48
	Total	**44**	**52.4**	**40**	**47.6**	**100**

Table 7. Relationship between Physical Activity and the Incidence of Osteoarthritis in Dr. M. Djamil Padang Hospital

No	Physical Activity	Incidence *Osteoarthritis*				Total	*P* value
		No *Osteoarthritis*		*Osteoarthritis*			
		f	%	*F*	%		
1	Low	19	41.3	27	8.7	6	0.000
2	Medium	23	82.1	5	7.9	28	
2	Height	2	20.0	8	80.0	10	
	Total	**44**	**52.5**	**40**	**46,4**	**100**	

DISCUSSION

The result of the study it can be seen that of the 84 respondents there were less than half (52.4%) of respondents with osteoarthritis incidence at the Rheumatology Clinic Dr. M. Djamil Padang. This research is in line with research conducted by Anggraini (2014) regarding the relationship between obesity and individual factors with the incidence of osteoarthritis, found that 50% of respondents with osteoarthritis incidence. Osteoarthritis (OA) is a chronic degenerative joint disease that often occurs and is associated with joint cartilage damage (Andriyasa,2012).

Osteoarthritis is a chronic joint disorder caused by imbalance in synthesis and degradation of joints, extracellular matrix, chondrocytes and subchondral bone in old age (Sjamsuhidajat et.al, 2011). Osteoarthritis also usually affects weight bearing joints, for example the hips, knees, vetebrae, but can also affect the shoulders, finger joints, and ankles. The knee is the joint most often affected by osteoarthritis of the many joints that can be attacked by osteoarthritis (Carlos, 2013). Assumptions of researchers, the incidence of osteoarthritis can be prevented by a healthy lifestyle, consuming vitamin D and calcium, maintaining body weight so as not to experience a heavy burden on the bones and regular exercise in order to prevent osteoarthritis.

The results of the study found more than half (56.0%) of respondents aged <60 years at the Rheumatology Clinic Dr. M. Djamil Padang. The aging process is thought to be the cause of increased weakness around the joints, decreased joint flexibility of cartilage calcification and decreased chondrocyte function which all support osteoarthritis. non pharmacologic is very important and includes education, physical therapy, occupational therapy and weight loss. In education, what is important is to convince patients to be independent, not always dependent on others. Although osteoarthritis cannot be cured, the patient's quality of life can be improved (Haq et al, 2003).

Assumptions of researchers, the incidence of osteoarthritis is due to changes that cause collagen and proteoglycans to decrease, there is tension from joint cartilage and also because of the reduced supply of nutrients to cartilage so that it will have an impact on the incidence of osteoarthritis. Age is an important factor in the occurrence of osteoarthritis. The older a person is, the greater the possibility of a decrease in joint function. As you age, the strength of your body's immunity will also decrease so that the ability of your body's organs will naturally decrease, including joint dysfunction which will result in osteoarthritis.

The results of the study found more than half (57.1%) of respondents with the female gender at the Rheumatology Clinic Dr.

M. Djamil. Price (2012) says gender can influence the occurrence of ostearthritis. Under 40 years of age, the frequency of osteoarthritis is more or less the same between women and men, but over 50 years of age the frequency is higher in women than men because of the hormonal changes that occur in postmenopausal women, there is a decrease in estrogen levels, thereby increasing cytokine synthesis. such as IL-1, IL-6, TNF and will accelerate collagen degradation and inhibit proteoglycan synthesis which affects joint health. Researcher's assumptions, it was found that 57.1% of respondents were female compared to 42.4% with male gender. This is due to the factor of the hormone estrogen which plays a role at menopause which occurs in women affecting the increase and decrease in estrogen levels which can cause weakness in the joints, thus allowing the occurrence of osteoarthritis. Apart from being caused by the hormone estrogen, women also have wider hips than men which can cause the legs to be closer to the knees so that the knee pressure is uneven and also the muscle mass around the knees in women is less than that of men. Therefore, women are more prone to experience osteoarthritis than men.

More than half (54.8%) of respondents who have low physical activity, while as many (11.9%) of respondents have high activity at the Rheumatology Clinic, Dr. M. Djamil Padang. Research shows that regular exercise is one of the important things to prevent osteoporosis, including fractures due to osteoporosis and falls. Exercise can increase bone mass, density, and strength in the elderly. Exercise also protects against hip fractures (Megan, 2008). Nina (2007), physiologically, exercise can increase aerobic capacity, strength, flexibility, and balance. Psychologically, exercise can improve mood, reduce the risk of senility, and prevent depression. Socially, exercise can reduce dependence on other people, make lots of friends, and increase productivity.

Strenuous physical activity causes proteoglycan levels to eventually drop very low, causing cartilage bones to become soft and lose elasticity and thus further compromising the integrity of the joint surface. Microscopically, peeling and fibrillation (vertical fissures) develop along the usually smooth articular cartilage on the surface of the osteoarthritis joint. Over time, there is a loss of cartilage in the joint space. Finally, the stress increases beyond the biomechanical strength of bone. Subchondral bone responds with vascular invasion and increased cellularity, becoming thickened and dense (a process known as eburnation) in a region of stress. On the other hand, someone with minimal daily activities is also at risk of developing osteoarthritis, especially the knee. Prolonged lack of joint activity will lead to disuse atrophy which increases the risk of trauma to the cartiages. In animal studies, immobilized joint cartilage showed a proteoglycan aggrecan synthesis in the cartilage that affects its biomechanics, associated with increased MMP which can cause more damage. severe Carlos (2013).

Assumptions of researchers in this study, it can be seen from filling out the questionnaire where it was found that 54.8% of the respondents had low activities such as sitting, standing, being quiet, watching TV. This is because low physical activity can put you at risk for osteoarthritis, especially the knee. Lack of joint activity that lasts a long time will cause disuse atrophy which will increase the conditions for trauma to the cartiago and result in the cartilage bone stiffening and losing elasticity, thus further sacrificing the integrity of the joint surface which will have an impact on the occurrence of osteoathritis.

The results of this study are proportion of respondents who experience osteoarthritis is more found in respondents who have an age of ≥ 60 years (83.8%) compared to those aged <60 years (19.1%). Based on the Chi Square test, it was found that $p = 0.000$ ($p \leq 0.05$). This means that there is a relationship between age and the incidence of osteoarthritis in the Rheumatology Clinic Dr.

M. Djamil Padang. The prevalence and severity of knee osteoarthritis increases with age. Knee osteoarthritis almost never occurs in children, rarely at the age of under 40 years and often at the age above 60 years (Sudoyo, 2009). Icelbacher 2000 The highest risk factor for osteoarthritis is age. The progressive increase in the prevalence of osteoarthritis is seen with increasing age. The results showed that 17.0% of respondents had an age of ≥ 60 years with no osteoarthritis and 16.2% of respondents had an age <60 years with osteoarthritis. This is because there are other factors that can influence the occurrence of osteoarthritis such as muscle weakness, race / genetics, joint trauma, vitamin D nutrition, comorbid diseases, and exercise that can affect the occurrence of osteoarthritis.

Triyanti (2016) research results show that there are more knee ostearthritis at age> 50 years than age, 50 years. This is due to the increasing age of the chondrocyte capacity to maintain the cartilage matrix is slowing down which will result in a decrease in joint flexibility and an increase in its susceptibility to injury. Assumptions, the incidence of osteoarthritis is caused by the different ages of each respondent. This is because a person's age is an important factor in the occurrence of osteoarthritis. As a person gets older, the possibility of a decrease in joint function is greater so that the strength of the body's immunity will also decrease causing the ability of the body's organs to decrease, especially joint dysfunction which results in the occurrence of osteoarthritis.

Age is the strongest risk factor. The mechanism is unclear, but it is closely related to the biological processes in the joint; the aging process will reduce the number of chondrocytes in the joint cartilage and will have a direct correlation with the degree of cartilage damage. The prevalence in women is greater than in men; the severity of osteoarthritis was also greater in women. Research shows that hormones play a role in the mechanism of occurrence of osteoarthritis (Musumeci 2015)

The proportion of respondents who experience osteoarthritis is more found in respondents who have the female gender (64.6%) than the male gender (25.0%). Based on the Chi Square test, it was found that p = 0.001 (p ≤ 0.05). This means that there is a sex relationship with the incidence of osteoarthritis in the Rheumatology Clinic Dr. M. Djamil Padang. Research conducted by Ayling Suryadi 2017 about the description of Risk Factors for Knee Osteoarthritis Patients in the Medical Rehabilitation Installation of Prof. Dr. R. D. Kandou Manado said that the female gender is most susceptible to osteoarthritis (70.4%).

The results showed that 25.0% of respondents had male gender with osteoarthritis and 37.5% of respondents had female gender without osteoarthritis. This is due to other factors that can affect the occurrence of osteoarthritis such as age, muscle weakness, race / genetics, joint trauma, vitamin D nutrition, work, exercise, anatomical abnormalities, metabolic diseases, and joint inflammatory diseases so that they can affect the occurrence of events. osteoarthritis. According to the researcher's assumption, the occurrence of osteoarthritis is caused by the female sex occurs due to decreased hormones, especially estrogen and other physiological functions of the body, where the function of the hormone estrogen is one of which is to help synthesize chondrocytes in the bone matrix, and if estrogen decreases, chondrocyte synthesis decreases so that proteoglycan synthesis and collagen also decreases while lysosome activity increases, this is what causes osteoarthritis to occur in many women.

Respondents with the incidence of osteoarthritis was found to be high in physical activity (80.0%) compared to moderate physical activity (17.9%). Based on the Chi Square test, it was found that p = 0.000 (p ≤ 0.05). This means that there is a relationship between physical activity and the incidence of osteoarthritis in the Clinic Clinic of Rheumatology, Dr. M. Djamil Padang.

Strenuous physical activity can cause proteoglycan levels to eventually drop very low, causing the cartilage to soften and lose elasticity and thus further compromising the surface integrity of the joint. Microscopically, peeling and fibrillation (vertical fissures) develop along the usually smooth articular cartilage on the surface of the osteoarthritis joint. Over time, there is a loss of cartilage in the joint space. Finally, the stress increases beyond the biomechanical strength of bone. Subchondral bone responds with vascular invasion and increased cellularity, becoming thickened and dense (a process known as eburnation) in the stress area (Carlos, 2013). Repetitive joint motion can predispose to OA; however, proper motion of the knee joint and the muscles around the knee can strengthen and stabilize the joint, thereby reducing the risk of OA.5 Knee OA may also be associated with a history of injury. Injuries that increase the risk of knee OA are tearing of the meniscus or injury to the anterior cruciate ligament (Musumeci 2015).

The results showed that 8.3% of respondents had high activity without osteoarthritis and 3.7% of respondents had moderate activity with osteoarthritis. This is due to other factors that can affect the occurrence of osteoarthritis such as age, gender, muscle weakness, race / genetics, joint trauma, vitamin D nutrition, work, exercise, anatomical disorders, metabolic disease, and joint inflammatory disease so that it can influence the occurrence of osteoarthritis. According to the assumption of researchers with high physical activity, the proteoglycan level eventually drops very low, so that the cartilage bones become soft and lose their elasticitis. This can compromise the integrity of the joint surface, so that it can lead to cartilage damage and failure of ligaments and other supporting structures that affect the knees and hips which will lead to osteoarthritis.

CONCLUSION

There is a significant relationship between age, gender, phisychal activity with incidence osteoarthritis in the hospital.

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