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Clinical Profile Of Knee Osteoarthritis In The Medical Rehabilitation Outpatient Installation Of Dr. Soetomo General Hospital Surabaya

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Abstract

Background: According to the American College of Rheumatology, osteoarthritis is a heterogeneous group of conditions that lead to joint signs and symptoms. This disease causes pain and disability in patients so that it interferes with daily activities and causes severe socio-economic impacts. The prevalence of osteoarthritis in Indonesia increases with age. This study aims to determine the clinical profile of knee osteoarthritis outpatients at the Medical Rehabilitation Installation at Dr. Soetomo General Hospital Surabaya. **Methods:** This study used retrospective descriptive method using medical records of knee osteoarthritis patients at the Medical Rehabilitation Outpatient Installation of Dr. Soetomo General Hospital Surabaya for the period July 2018 - August 2019. There were obtained 87 samples of patient data that met the inclusion criteria. The variables in this study such as age, gender, type of knee osteoarthritis of the patient, and the location of the patient's knee osteoarthritis. **Results:** The results showed that most of the samples were in the elderly group (>60 years) as many as 50.57%, the patients were female (86.21%). The patient had secondary osteoarthritis and the patient had knee osteoarthritis on both sides of the knee. **Conclusion:** Based on this study, it was concluded that age, gender, location of knee osteoarthritis are appropriate variables in various other studies and the existing theories.

Keywords: Knee; osteoarthritis; outpatient; age; gender

1. Introduction

According to the American College of Rheumatology, osteoarthritis is a heterogeneous group of conditions that lead to joint signs and symptoms. This disease causes pain and disability in patients so that it interferes with daily activities and causes severe socio-economic impacts [1]. In the US, osteoarthritis is second only to ischemic heart disease as a cause of occupational disability in men over 50 years of age and accounts for more hospitalizations than rheumatoid arthritis (RA) each year [2]. Knee osteoarthritis has problems such as pain, decreased Range of Motion (ROM), edema, and decreased muscle strength [3].

Osteoarthritis is characterized by the abrasion of joint cartilage and the formation of new, irregular bone on the joint surface. Pain in the joints is the biggest symptom of patients with osteoarthritis. Pain is caused after doing activities with the use of joints and pain can be relieved by rest. Trauma and obesity can increase the risk of osteoarthritis. This disease causes pain and disability in patients so that it interferes with daily activities and causes severe socio-economic impacts [1].

Osteoarthritis is believed to be caused by a wear and tear mechanism on the articular surfaces of the joints [4]. In osteoarthritis there is a decrease in joint cartilage function followed by ulceration or loss of joint

cartilage resulting in bone contact with bone in the joint followed by the formation of subchondral cysts, osteophytes at the bone edges, and an inflammatory reaction in the synovial membrane. Joint swelling, thickening of the synovial membrane and joint capsule, and stretching of the ligaments cause instability, deformity, and pain [5]. Based on the theories, there are two kinds of risk factors that may predispose knee osteoarthritis. There are modifiable and unmodifiable risk factors. Modifiable factors such as obesity and overweight, comorbidity, occupational factors, physical activity, biomechanical factors, dietary exposures [6]. Meanwhile the unmodifiable risk factors including age, sex, and genetic makeup [7]. This study was conducted to determine the clinical profile of knee osteoarthritis patients in the Medical Rehabilitation Outpatient Installation of Dr. Soetomo General Hospital Surabaya. Several risk factors and clinical profiles such as age, gender, type of osteoarthritis, and the location of knee osteoarthritis need to be known to prevent knee osteoarthritis early so that it can be treated properly.

2. Method

This research method is descriptive retrospective using secondary data in the form of medical records of knee osteoarthritis patients at the Medical Rehabilitation Outpatient Installation at Dr Soetomo Hospital in the period July 2018 - August 2019 at the Department of Physical Medicine and Rehabilitation Outpatient Installation at RSUD Dr. Soetomo Surabaya, Indonesia. This study used a total sampling technique in which 87 patients of knee osteoarthritis were treated at the Medical Rehabilitation Outpatient Installation at Dr. Soetomo General Hospital. The variables in this study included age, gender, type of knee osteoarthritis, and location of knee osteoarthritis. This research has been approved by the research ethics committee of RSUD Dr. Soetomo (0271/LOE/301.4.2/XI/2020).

3. Result

This research was conducted at the Medical Rehabilitation Installation at RSUD Dr. Soetomo, Surabaya, Indonesia. Obtained 87 samples from knee osteoarthritis outpatients who were treated at the Medical Rehabilitation Installation from the period July 2018 - August 2019.

Table 1. Data on Age Distribution of Knee Osteoarthritis Patients in The Medical Rehabilitation Outpatient Installation at Dr. Hospital Soetomo Surabaya

Age (years)	Frequency (n)	Percentage (%)
Elderly (>60)	44	50,57
Adult (18-60)	41	47,13
Children (<18)	2	2,30
Total	87	100

From the result, it could be seen that the largest sample was appeared in patients who had an age range of more than 60 years, it was obtained 44 patients (50.57%), then patients with an age range of 18-60 years, obtained 41 patients (47.13%), and samples with the lowest number was found in patients with an age range of less than 18 years, as many as 2 patients (2.30%).

Table 2. Data on Gender Distribution of Knee Osteoarthritis Patients in The Medical Rehabilitation Outpatient Installation at Dr. Hospital. Soetomo Surabaya

Gender	Frequency (n)	Percentage (%)
Female	75	86,21
Male	12	13,79
Total	87	100

The results showed that the majority of the samples were female patients, as many as 75 patients (86.21%), then male patients, as many as 12 patients (13.79%).

Table 3. Distribution Data Types of Knee Osteoarthritis in The Medical Rehabilitation Outpatient Installation at Dr. Hospital. Soetomo Surabaya

Type of Knee Osteoarthritis	Frequency (n)	Percentage (%)
Primary	10	11,49
Secondary	77	88,51
Total	87	100

From the data above showed that the highest sample was found in patients suffering from secondary knee OA as many as 77 patients (88.51%), then patients suffering from primary knee OA as many as 10 patients (11.49%).

Table 4. Distribution Data Location of Knee Osteoarthritis in The Medical Rehabilitation Outpatient Installation at Dr. Hospital. Soetomo Surabaya

Location of Knee Osteoarthritis	Frequency (n)	Percentage (%)
Bilateral	53	60,92
Dextra	19	21,84
Sinistra	15	17,24
Total	87	100

The results showed that the largest sample was in patients suffering from knee OA on both sides of the knee, there were 53 patients (60.92%), then patients with knee OA on the right side, as many as 19 patients (21.84%), and samples with the lowest number was found in patients with knee OA on the left side, as many as 15 patients (17.24%).

4. Discussion

This study used a descriptive with a retrospective approach, which used secondary data in the form of medical records of knee osteoarthritis patients at Medical Rehabilitation Outpatient Installation Dr. Soetomo General Hospital Surabaya in the period of July 2019 – August 2018.

From the result of the study, elderly patients (>60 years old) has the largest number for the case of knee osteoarthritis. This could be happened because one of the risk factors for knee osteoarthritis is the

degenerative process [8]. Based on epidemiological data in the United States, the age group above 65 years old knee osteoarthritis is the most affected patients in knee osteoarthritis with prevalence data of 33.6%. Knee osteoarthritis has bigger frequency scale than other types of OA. The occurrence of knee osteoarthritis rises with age and daily activity with a longer life span and an rising average body weight of a population [8]. The research that observe prevalence of knee osteoarthritis that was conducted in Singapore reported that the frequency of knee osteoarthritis rises with age. Knee osteoarthritis occurs to hit adults in the middle age [9]. Another study that was conducted by Prashansanie Hettihewa et al. (2018) reported that the median age of patients that were affected by knee osteoarthritis was 63.3 years old. The American College of Rheumatology (ACR) uses the increasing of age as one of the criteria to classify knee osteoarthritis. Knee pain, age over 50 years old, morning stiffness less than 30 minutes, bony enlargement on examination, bony tenderness, crepitus on active movement, and not having palpable warmth of synovium are the criteria that was used by the ACR to classify knee osteoarthritis [10]. Fatigue fracture in the knee that induced by the aging of cartilage (shorter proteome chains and decreased water content) could lead to knee osteoarthritis. Also the joint destruction that predisposed by rising of the subchondral stiffness in trabecular microfractures and the neuromuscular changes with age may cause knee osteoarthritis [11].

In our study showed that female patients is the most gender of the knee osteoarthritis, as many as 75 patients (86.21%). This findings is much the same as a research that was conducted by Rosita, P., E., et al (2021), their study samples' comparison were the knee osteoarthritis patients in male and female was higher in female (32 samples for male and 98 samples for female) [12]. This might be occurred because women have higher prevalence of knee OA than men. Based on the literature data, there are the unmodifiable risk factors that is significantly associated with the occurrence of the knee OA and female gender is one of them [13]. This frequency could rise as the patient approach menopause and overweight or obese [14]. From a study that was conducted by Szilagyi, I., et al (2021) they discovered that when compared to men, the prevalence of risk factors was generally higher in women, but not in alcohol consumption and smoking. They found significant results in their study, the PAF (population attributable fractions) for BMI in women was 25.6% and 19.3% in men [15]. Another study that was conducted by Vina, E. R., et al., (2018), they found that there are race and genetic factors in an addition to gender factors that affect the worsening of knee OA. Their study discovered that races that more likely to have worsening of the knee OA were Asian-African races than White races [16]. A study that was conducted by Lin, X., et al (2020) observed the risk factors for OA by the gene level, they discovered that methylation changes enhancers cause the risk of developing OA in women is higher than men. the human phenotype of osteoarthritis are associated with these genes. Enhancers that recruiting the active chromatin factors in a tissue type-specific manner could enhance the expression of target genes. Low methylation is needed by the formation of an open chromatin structure in enhancer regions. Therefore, the low methylation in females may cause the abnormal activation of enhancers that found in osteoarthritis phenotypes [17]. In a study that using cohort study design that was conducted by Sasaki, E., et al (2020) in Japan, they were observing the prevention of early knee osteoarthritis (EKO). They obtained 822 patients who was diagnosed with Early Knee OA (Kellgren-Lawrence grade 0/1) as samples, it is discovered that the prevalence of EKO was 9.5% in men and 15.0% in women (p=0.011). It could be concluded that female gender already had higher risk factors than men since the early knee osteoarthritis [18].

From the result of our study, the most common types of knee OA cases were secondary knee OA, as many as 77 patients (88.51%), then 10 patients (11.49%). These results indicate that the most cases of knee OA patients are secondary knee OA. This indicates that the majority of knee OA patients who treated in the Medical Rehabilitation Outpatient Installation at Dr. Soetomo General Hospital is a patient who has underlying diseases such as systemic disease and inflammation, as well as several factors such as joint damage that can be enlarged during activities, strenuous exercise, previous injuries that cause OA in these patients [19]. Based on the etiology, knee OA is divided into two, there are primary knee OA and secondary knee OA. Primary knee OA is OA of unknown or idiopathic etiology. While secondary knee OA is an OA that occurs because it is based on a disease or medical condition such as trauma, rheumatoid arthritis, gouty

arthritis, congenital abnormalities, bone mineral abnormalities, and malignancies [8]. However, the results of our study are different from the research conducted by Sonjaya M. R. et al (2015) in Bandung. In their study, there were more patients with primary knee osteoarthritis than secondary [20]. Nevertheless, their research was conducted in the Department of Orthopedics Al-Islam Hospital in Bandung, while our research was conducted at the Medical Rehabilitation Outpatient Installation Dr. Soetomo General Hospital in Surabaya. For that reason, further research is needed on the clinical profile of primary and secondary osteoarthritis patients.

From the result of our study, there were 53 patients suffering from knee OA in both legs (bilateral). In this study, the most common location group for knee OA was the group with bilateral knee OA as much as 60.92%. Then followed by patients with right knee OA location group as many as 19 patients (21.84%). Meanwhile, the smallest number of samples was in the left knee OA location group, which was only 15 patients (17.24%). This shows that in knee OA patients who receive physical exercise therapy in the Medical Rehabilitation Outpatient Installation, Dr. Soetomo has an abnormal load on both sides of the knee. The results of a study by Croft in 1992 showed that one of the risk factors for knee OA is repetitive joint use. Knee OA is more common in people who in their daily activities often squat and kneel. Very repetitive, intense physical activity will have a high impact on increasing the risk of knee OA. Therefore, from the results of the study, it was found that the majority of knee OA patients support excessive loads on both sides of the knee. This is related to the patient's daily activities [14]. Based on the research data in table 4, the second most data was obtained, there were patients with OA genu dextra after that patients with OA genu sinistra. Based on the literature that has been described previously that one of the risk factors for knee OA is the repetitive use of the joint and the excessive load experienced by the patient's knee joint [14]. This shows that some of the genu OA patients who received physical exercise therapy in the Outpatient Medical Rehabilitation Installation at RSUD Dr. Soetomo period July 2018 s.d. August 2019 was right-footed. Our result is similar to a study that was conducted by Ahmad I. W. et al (2018). In their result, they discovered that most knee osteoarthritis patients had osteoarthritis on the both sides of their knees, followed by the right only knee osteoarthritis patients, and left only knee osteoarthritis patients number is the least [21]. Right-footed or dextropedal is a condition in which a person dominantly uses the right foot compared to the left foot during daily activities. Physical activity in the limbs is determined by the correct proximal to distal leg segment movement and the control of leg movement directly affects foot speed. Limb control requires, obtains, and utilizes information from proprioceptors from all limbs [22]. There are very little research on footedness when compared to handedness. However, from a practical point of view, functional preference for lower extremities is very important in daily activities and sports performance [23].

5. Conclusion

From our study, we found the most of the knee osteoarthritis patients were patients with an age group of more than 60 years. Based on the patients' gender, most of the patients were female. In our study, we found that the most of the patients suffered from secondary knee osteoarthritis. Based on the location site of patients' the knee osteoarthritis, we discovered that the most of the knee osteoarthritis in patients affects both sides of the patient's knee. Further research is needed to determine the clinical profile of knee osteoarthritis at the Medical Rehabilitation Outpatient Installation using variables such as Grade Osteoarthritis, BMI, and the therapeutic options obtained by the patient while being treated at the Medical Rehabilitation Installation at Dr. Soetomo General Hospital.

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