The functional outcome in short-term follow up after Total Knee Replacement (TKR) in Kandou Hospital, Manado, Indonesia

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ABSTRACT

Background: The percentage of knee osteoarthritis incidence in Indonesia is quite high. In addition, most cases of knee osteoarthritis patients are performed Total Knee Replacement (TKR). Besides the effectiveness of TKR surgery to overcome the knee osteoarthritis, previous studies showed that almost a third patients reported unfavourable pain outcomes at between 3 months and 5 years after TKR surgery. So, this study aims to evaluate the functional outcome of patients after performed TKR at Prof Dr R.D. Kandou Manado Hospital during January–December 2018 period.

Methods: A cross-sectional study was carried out among 32 patients who underwent TKR at Prof Dr R.D. Kandou Manado during the study period. Before surgery and 3-month post-surgery, all of patients were evaluated with Knee Society Score questionnaire. The collected data that consisted of knee score and knee function score by American Knee Society Score (AKS), as well as data demographics of respondents, were analyzed with paired T-test using SPSS version 23 for Windows.

Results: Most of the patients are in the elderly category of age (≥60 years old) (78.13%) and this disease showed a higher prevalence in women (78.13%) than in men (21.87%). Patients showed a significant improvement in the degree of knee function (p<0.0001) at 3-months after surgery compared to before surgery. Moreover, as many as 21.87% of patients still experience pain 3-months after TKR.

Conclusions: A significant improvement was found among patients in the degree of knee function after TKR. However, several patients still experience pain at follow up 3 months after TKR.

Keywords: knee society score, Total Knee Replacement, functional outcome

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INTRODUCTION

Total knee replacement (TKR) is a surgical procedure to the patient in knee joint pain and/or in the condition of inability mobilization.1 This condition is mainly caused by osteoarthritis and rheumatoid arthritis disease. Osteoarthritis is a degeneration of joint disorder caused by loss of cartilage, which is a joint bearing, generally produced by injury or ageing.1 The cartilage of the patient is damaged and become thinner and causes more joint friction. This causes pain, stiffness, and inability to walk. The percentage of knee osteoarthritis incidence in Indonesia is quite high, 15.5% in men and 12.7% in women.1 During a total knee replacement, the end of the femur bone is removed and replaced with a metal shell. The end of the lower leg bone (tibia) is also removed and replaced with a metal stem. Those two bones are connected by plastic as movement damper. In 2010, the prevalence of total knee replacement in the entire United States population was 1.52%, the prevalence was higher among women than among men and increased with age, reaching 10.38% at eighty years.2

Total Knee Replacement (TKR) is an end of the line treatment for patients with severe pain & functional limitations and also the best management of end-stage arthritis of the knee.3 Besides the effectiveness of total knee replacement to overcome knee joint injury, there are some risks for the patients after performing the surgery, i.e. prosthetic dislocation due to infection, blood clots around the operating area, and prolonged pain. Previous studies showed that 10% to 34% patients reported unfavourable pain outcomes at between 3 months and 5 years after TKR surgery.4,5 However, there are no reports how the quality of life of patients after undergoing TKR surgery in Manado until now.

Based on the aforementioned, this study aims to analyze the functional outcome of patients after performed Total Knee Replacement in Prof Dr R.D. Kandou Manado hospital in period of January–December 2018.

METHODS

A cross-sectional study was carried out among 32 patients who underwent Total Knee Replacement (TKR) at Prof Dr R.D. Kandou Manado Hospital during January–December 2018 period. The study subjects were all of osteoarthritis patients that were performed TKR by five orthopaedic surgeons in the same technique and the same type of implant. The
individuals were evaluated with the Knee Society Score (KSS) questionnaire by evaluator in the pre-surgery and 3-months post-surgery period.

Data regarding the category of ages, gender, knee score, and period of surgery were evaluated by percentage, mean, standard deviation, and number. The knee score and knee function score were assessed using American Knee Society Score (AKS) where the interobserver variances by patient category consisted: Category A (A patients do not have any substantial disease in the contralateral knee), Category B (who have substantial arthrosis), and Category C (those with multiple joint involvement or generalized debility). A paired T-Test was used to evaluate the difference of knee score before, and 3 months after surgery whereas p-value less than 0.05 were statistically significant by SPSS version 23 for Windows.

RESULTS

In Table 1, the age and gender distribution can be evaluated into two groups. The recent finding suggests that the osteoarthritis disease generally occurred higher in the elderly population (>60 years old) and women groups with the percentage is 78.13%, respectively (Table 1).

According to Table 2, it can be depicted that the clinical function of OA patients before TKR and 3 months after TKR were evaluated based on the Knee Score. The knee score is 86.38±3.62 at 3 months post-TKR shows that patients are in excellent condition and showing a significantly different compared between groups (p<0.0001) (Table 2). In addition, the OA patients before TKR and 3 months after TKR were also evaluated based on the Knee Function Score. The recent findings suggest that the knee function score is 96.25±9.98 at 3 months post-TKR shows that patients are in excellent condition and also showing a significantly different compared between groups (p<0.0001) (Table 2).

Our study also assesses the group category of patients who underwent TKR based on AKS. They are classified further into Category A, B, and C. Our

| Table 1  | Data demographics of respondents who underwent Total Knee Replacement (TKR) therapy |
|----------|--------------------------------------------------------------------------------------|
| Variables| Number of patients | Percentage (%) |
| Age category | | |
| Middle age (45-59) | 7 | 21.87 |
| Elderly (≥60) | 25 | 78.13 |
| Gender | | |
| Women | 25 | 78.13 |
| Men | 7 | 21.87 |

| Table 2  | The knee score and knee function score in pre-surgery and 3-month post-surgery groups. |
|----------|--------------------------------------------------------------------------------------|
| Period | N | Mean±SD | Knee score (N=32) | P-Value |
| Pre-surgery | 32 | 26.56±8.65 | Poor | Fair | Good | Excellent | <0.0001 |
| 3-month post-surgery | 32 | 86.38±3.62 | 0 | 0 | 2 | 30 |
| Period | N | Mean±SD | Knee function score (N=32) | P-Value |
| Pre-surgery | 32 | 50.49±9.28 | Poor | Fair | Good | Excellent | <0.0001 |
| 3-month post-surgery | 32 | 96.25±8.98 | 0 | 2 | 0 | 30 |

| Table 3  | Category score of patients that perform total knee replacement |
|----------|------------------------------------------------------------------|
| Category | Knee score (N) | Percentage (%) |
| A | 25 | 78.13 |
| B | 7 | 21.87 |
| C | 0 | 0 |
study found that about 21.87% of patients in category B, whereas they still experience pain 3 months after TKR surgery (Table 3).

**DISCUSSION**

According to a study by Linda K. George in 2008, most cases of knee osteoarthritis are found at > 65 years old. In our study, we found the same characteristics found at ages > 60 years old at 78,13%. It is well known that ageing is associated with changes in the articular cartilage, subchondral bone, synovium, meniscus, ligaments/tendons, and typical changes mechanisms in all tissues.

According to a study by Heidari MD in 2011, most cases of knee osteoarthritis are found in women. In our study, we found the same characteristics found in women at 78,13%. Several studies have revealed that the high prevalence of osteoarthritis in women correlated with the low estrogen hormone during menopause. Estrogen suppresses bone resorption, resulting in slowing down the osteoporosis process. Estrogen deficiency can affect the osteoclast live longer and are therefore able to resorb more bone. In response to the increased bone resorption, there is increased bone formation, and a high-turnover state develops which leads to bone loss.

In our study we found a significant improvement in the degree of knee function such as walking ability to bend the knee, to straighten the foot up the ladder of waking stability in patients 3 months after TKR surgery compared to before. The same results with previous studies according to Backowicz in 2018 and Bytqi in 2015.

According to an earlier study by Vikky Wylde in 2018 and Lewis in 2015, which more than 20% patients still experience pain at 3 months post-TKR. In our study we found that 21.87% of patients still experience pain at 3 months post-TKR.

Also in their study reported several factors such as patient’s characteristics (age, gender, education, employment status), clinical conditions (Preoperative pain, weight loss, pain in other parts), psychosocial (depression, anxiety, social support, expectation before surgery, reasons for surgery), perioperative (type of implant, duration of operation), and Biomechanical (varus-valgus angle, chondromalacia) were involved. Which is thought to be a possible factor in the cause of pain after 3 months post-TKR.

**CONCLUSION**

Total knee replacement is a surgical procedure that was proven to be reliable and feasible for end-stage knee osteoarthritis patients in elderly individuals. The same result in Manado that patients showed improvement of the degree of knee function after TKR and also found that some patients still experience pain at follow up 3 months after TKR.

**CONFLICT OF INTEREST**

There is no competing interest regarding the manuscript

**ETHICAL CONSIDERATION**

Ethical approval has been obtained from the Ethics Committee of Universitas Sam Ratulangi prior to the study being conducted

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None

**AUTHOR CONTRIBUTION**

All of the authors are equally contributed to the study from the conceptual framework, data gathering, data analysis, until reporting the results of study.

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