



Total Hip Arthroplasty in Sanglah General Hospital Denpasar, January 2013 – July 2016: A Cross-Sectional Study

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ABSTRACT

Background: Total Hip Arthroplasty (THA) is one of the most frequent elective surgeries in orthopaedics and traumatology. Patient characteristics are important predictors for a successful treatment. **Objectives:** To provide descriptive data about THA patients' characteristics in Sanglah General Hospital, January 2013 - July 2016. **Methods:** A cross-sectional descriptive study of THA cases at Sanglah General Hospital from January 2013 to July 2016. Data obtained were including sex, age, diagnosis, arthroplasty type, comorbidities, ASA status, duration of operation, and postoperative care. **Results:** There were 45 patients, mostly women (67.6%), with an average age 55.6 ± 11.4 years, osteoarthritis was the major diagnosis (42.22%), hypertension was the most frequent comorbid (37.8%), and most patients had arthroplasty procedure with uncemented fixation. **Conclusion:** Patient characteristics and THA procedures have similarities with many studies in different countries.

Keywords: total hip arthroplasty, characteristics, orthopaedi

ABSTRAK

Latar Belakang: *Total Hip Arthroplasty* (THA) adalah salah satu operasi elektif yang sering dilakukan di bidang orthopaedi dan traumatologi. Karakteristik pasien merupakan prediktor penting untuk keberhasilan terapi. **Tujuan:** Menyediakan data deskriptif berdasarkan karakteristik pasien THA di Rumah Sakit Umum Pusat Sanglah Januari 2013-Juli 2016. **Metode:** Studi deskriptif *cross-sectional* kasus *total hip arthroplasty* (THA) elektif di Rumah Sakit Umum Pusat Sanglah periode Januari 2013 sampai Juli 2016. Data yang dianalisis meliputi jenis kelamin, usia, diagnosis, tipe *arthroplasty*, komorbiditas, status ASA, durasi operasi, dan perawatan pasca-operasi. **Hasil:** Didapatkan 45 pasien, kebanyakan wanita (67,6%), dengan rerata usia 55.6 ± 11.4 tahun, diagnosis utama osteoarthritis (42,22%), penyakit komorbid hipertensi (37,8%), dan sebagian besar tindakan *arthroplasty* dengan metode fiksasi *uncemented*. **Simpulan:** Karakteristik pasien dan prosedur THA memiliki kesamaan dengan kebanyakan studi lain di berbagai negara. I Gusti Kadek Satrio Adiwardhana. *Total Hip Arthroplasty* di Rumah Sakit Sanglah Denpasar, Januari 2013 – Juli 2016: *Studi Cross-Sectional*

Keywords: total hip arthroplasty, karakteristik, orthopaedi

INTRODUCTION

Osteoarthritis is the most common indication for THA. In a study conducted in United Kingdom, osteoarthritis accounted for 93% of THA procedure. Several other diseases were also indicated, including osteonecrosis (2%), femoral neck fracture (2%), development dysplasia of the hip (2%) and inflammatory arthritis (1%).^{1,2}

Most THA patients will experience decrease in pain, increase in mobility, increase of function, and eventual increase in quality of life.³ During THA procedure, defected articular tissues are replaced with synthetic materials. The head and proximal neck of

the femur are surgically excised and the acetabular cartilage and subchondral bone are removed. An artificial canal is created in the proximal medullary region of the femur and a metal femoral prosthesis is inserted. An acetabular component, which is composed of a high-molecular-weight polyethylene, is then inserted proximally into the enlarged acetabular space. The components then must be fixated to the bone with either polymethylmethacrylate or uncemented fixation.⁴ Since its development in the 1960s, several approaches have been developed including direct anterior, direct lateral and posterior approaches.⁵

Dreinhofer et al found that most orthopaedic and referring physicians consider pain with activity, rest pain, and functional limitation as the most important criteria for THA, whereas radiographical and range of motion were of less importance.⁶ No international consensus had been formed for the indication for THA. The Global Orthopaedic Registry had shown that patient selection varies between surgeons, practitioner, referring physician and between countries.⁵

Over 1 million THA procedures are being conducted every year around the world.⁵ In the United Kingdom, 71,021 operations had been done until the end of March

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2010.⁷ Between 1990 and 2002, the rate of primary THA increased from 47 per 100,000 population to 69 per 100,000 population in the United States. In Denmark the rate of THA increased 30% from 101 to 131 per 100,000 population. Women utilize the procedure 1.5-2 times higher than men. In South Korea, this procedure was done seven to eight times more in women than in men. Most of the patients who undergo THA (65%) are at the age of 65 and older.^{5,8}

Patient characteristics are an important predictor for a successful THA procedure and eventual prognosis.⁵ Although the classification of younger and older patients varies across studies, when age is shown to be a significant factor, younger patients are consistently shown to be at greater risk for revision at intervals ranging from 2 to 20 years postoperatively. The influence of age on hip revision varies as a result of the femoral and acetabular components. Male sex patients have a 3-5 fold increased risk of revision.⁹ Increased age ($p < 0.027$) and obesity (Odds ratio [OR] 1.20; CI 1.02-1.42; $p < 0.032$)

Table 1. Characteristics of patients undergoing Total Hip Arthroplasty

Characteristic	Category	No. of Patients
Gender	Male	15
	Female	30
Age Group	<45	7
	45-54	15
	55-64	13
	65-74	9
	>75	1
Type of arthroplasty	Primary	40
	Revision	5
Implant fixation	Uncemented	40
	Cemented	5
Primary Diagnosis	Osteoarthritis	19
	Fracture	14
	Osteonecrosis	8
	Rheumatoid Arthritis	4
Comorbid Condition	Hypertension	17
	Diabetes mellitus	7
	Tumor	2
	Congestive heart failure	3
	Cerebrovascular accident	2
	Other	2
ASA Classification	ASA II	21
	ASA III	24
Anesthesia Technique	General	22
	Spinal	18
Post-operative Care	ICU	12
	OU	33

have been related to increased chance of experiencing any adverse event after THA.¹⁰ Increased incidence of surgical site infection was associated with female gender, obesity, and American Society of Anaesthesiologist (ASA) score ≥ 3 .¹¹ Data concerning patient characteristic undergoing THA in Indonesia is still lacking, despite the increasing frequency of procedure.

Objective

To provide descriptive data on the characteristics of patients undergoing Total Hip Arthroplasty in Sanglah General Hospital Denpasar, from January 2013-July 2016.

METHOD

This study used descriptive cross-sectional design, conducted at Sanglah General Hospital, Denpasar, on patients admitted for elective THA surgery from January 2013 to July 2016. Data were obtained from Central Operating Room reports

Sample

Samples were all THA surgery patients performed by orthopedic surgeons, regardless of the type of surgery (either primary or revision), signed informed consent.

Data Collection

All pertinent data were collected and put into tabulation table. The following demographic data were gathered such as gender and age (stratified into 5-year group, <45 y.o, 45-54 y.o, 55-64 y.o, 65-74 y.o, and >74 y.o). Other variables including underlying diagnosis (osteoarthritis [OA], fracture, osteonecrosis, rheumatoid arthritis [RA], or other), type of arthroplasty (primary or revision), comorbid condition, American Society of Anesthesiologists' physical status classification (ASA), procedures (type of anesthesia and duration of surgery), and post-operative care were also collected and analyzed.

Statistical Analysis

Statistical analysis was done with SPSS version 17. Univariate analysis was performed to all variables and results were given as distribution of percentages or mean \pm SD.

RESULTS

A total of 45 THA surgery patients from January 2013 to July 2016 were included in this study. Thirty patients (67.6%) were

female (table 1) and mean age was 55.6 ± 11.4 years, ranged 29-82 years. Only 7 patients were aged less than 45 years (15.6%) and majority (15 patients) were aged between 45-54 years (33.3%). (**Table 1**). Forty patients went through primary arthroplasty (88.9%), 5 patients underwent revision (11.1%). Forty patients had uncemented fixation (88.9%).

OA was the main underlying diagnosis for THA. Almost all patients had at least one pre-operative comorbid condition (43/95.5%), hypertension was the most prevalent (**Table 1**).

Approximately half of patients were classified as ASA III (Table 1). The most common technique for anesthesia was general anesthesia, given to 22 patients (48.95%). The mean of surgery duration was more than 3 hours (203.11 ± 38.79 minutes). Prognosis was generally good, more THA patients were admitted to the Orthopedics Unit than to Intensive Care Unit (73.3% vs. 26.7%).

DISCUSSION

Total hip arthroplasty or THA is one of the major orthopedic procedures with primary goals of pain relief and function restoration. Until recently, there are have been no reliable data in Indonesia regarding prevalence or implementation of this procedure, while the international data show that the prevalence is 60 to 200 procedures/100,000 inhabitants.¹² This procedure is estimated to increase due to its success and cost-effectiveness.¹³

A descriptive cross-sectional retrospective analysis was done to obtain demographic data and intervention-related characteristics of THA patients in Sanglah General Hospital during January 2013-July 2016. Population of this study showed similar demographic characteristics with most literatures: majority were female and older than 45 years. OA is the main indication for THA surgery, and it is known to be more prevalent in women.^{14,15}

In this study 42,2% patients had OA diagnosis. Majority of patients were older than 45 year, the highest proportion was in 45-54 year group. It differs from 2 larger sample studies ($n > 500$ patients) on Brazilian THA patients with highest prevalence in 65 years or older.^{13,16} Those studies also found high rate of comorbid conditions especially hypertension. THA

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patients are in advancing age associated with increased comorbidities as more than 60% of population aged 65 years and above having at least one comorbidity.²⁰ Some studies found that the presence of comorbidities could be a poor predictor for survival after THA surgery.¹⁷

Most of the patients (88.9%) underwent primary procedure with uncemented implants than cemented type. Uncemented implant is one of the advancement in fixation technologies, which allows bone to grow into or onto the prosthesis. Unfortunately, there is still a debate about effectiveness and safety between uncemented and cemented procedures.¹⁸⁻²⁰

THA surgeries were mostly performed in high risk patients with ASA III. In the last few decades, many researches were focused

on delineating prognostic predictive effect of pre-operative variables. Study by Zenk Osmanski et al. (2015)¹⁸ showed that pre-operative variables such as advancing age and ASA score were positively correlated with less favorable post-operative results, by increasing length of stay and risk of complication.²¹ Those variables were also significantly associated with intra-operative risk as it increased surgery duration.¹² Thus, individual assessments and special consideration should be made particularly for those patient groups. Overall, despite the high prevalent of high risk patients group, the outcome of THA was good, 73.3% patients were admitted to orthopedic unit instead of intensive care unit. This evidence subsequently suggested that outcome may be implicated by various factors and further research is needed.

This research has several limitations. First, cross-sectional study is descriptive, so no significant conclusions could be drawn on this group. Secondly, there may be some concerns about data collection procedures. However, this study tried to provide initial information about total hip arthroplasty patients and procedures in Sanglah General Hospital.

CONCLUSION

This study found that the majority of patients were female, at age of 45–54 years old, had hypertension, had underlying diagnosis of OA, were classified as ASA III, underwent a primary and uncemented THA with general anesthesia, and admitted to Orthopedics Unit after surgery. Those characteristics were similar to most studies conducted in different health care settings and countries.

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