

노인재활

게시일시 및 장소 : 10 월 18 일(금) 08:30-12:20 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 10:00-10:45 Room G(3F)

## **P 1-37**

### **The Influence of Comorbidities on Short-term Functional Outcomes after Unilateral TKA**

Youn Ji Kim<sup>1\*</sup>, Bo Ryun Kim<sup>1†</sup>, Sang Rim Kim<sup>1</sup>, Kwang Woo Nam<sup>1</sup>, So Young Lee<sup>1</sup>, Young Geun Park<sup>1</sup>, Min Ji Suh<sup>1</sup>, Won Bin Kim<sup>1</sup>

Jeju National University School of Medicine, Regional Rheumatoid and Degenerative Arthritis Center, Jeju National University Hospital, Jeju, Republic of Korea, Department of Rehabilitation Medicine<sup>1</sup>, Jeju National University School of Medicine, Regional Rheumatoid and Degenerative Arthritis Center, Jeju National University Hospital, Jeju, Republic of Korea, Department of Orthopedic Surgery<sup>2</sup>

#### **Objective**

This study was undertaken to investigate the effect of comorbidities on physical function, quality of life and pain in patients with 3 months after unilateral total knee arthroplasty (TKA).

#### **Methods**

In this retrospective cohort study, we assessed a total of 140 patients (22 males and 118 females; average age 72.3±5.8 years) who underwent a unilateral TKA. Comorbidities were classified into osteoporosis, sarcopenia (defined as a loss of skeletal muscle mass by Bioelectrical Impedance Analysis), degenerative spine disease, diabetes, and hypertension. All patients completed performance-based physical function tests including range of motion (ROM) of surgical knee, stair climbing test (SCT), 6-minute walk test (6MWT), timed up and go test (TUG), peak torque (PT) of the extensor of surgical knee, peak torque (PT) of the flexor of surgical knee and instrumental gait analysis for spatio-temporal parameters. Self-reported physical function and pain were measured using the Western Ontario McMaster Universities Osteoarthritis Index (WOMAC) and self-reported quality of life was measured using the EuroQOL five dimensions (EQ-5D) questionnaire.

#### **Results**

The prevalence of osteoporosis was 51.4 % (72 of 140) of patients, sarcopenia in 5.0 % (7 of 140), degenerative spine disease in 15.7 % (22 of 140), diabetes in 19.3 % (27 of 140), and hypertension in 69.3 % (97 of 140). In the univariate analyses, patients with osteoporosis exhibited significantly longer time in SCT-ascent, SCT-descent and TUG, also lower scores in 6MWT and PT of the extensor of surgical knee. Patients with degenerative spine disease exhibited significantly negative scores in knee extension ROM. Patients with diabetes showed significantly negative correlation with PT of the extensor

of surgical knee and knee flexion ROM and higher scores in WOMAC-stiffness. After adjusting for age, sex, BMI, preoperative physical function by the linear regression, WOMAC stiffness remained independently associated with patients with diabetes ( $\beta=0.719$ , 95% CI 0.277, 1.161,  $p=0.002$ ). 6MWT ( $\beta=-56.469$ , 95% CI -88.477, -24.462,  $p=0.001$ ), TUG ( $\beta=0.633$ , 95% CI 0.091, 1.175,  $p=0.022$ ), SCT-ascent ( $\beta=1.299$ , 95% CI 0.050, 2.547,  $p=0.042$ ), and PT of the extensor of surgical knee ( $\beta=-7.347$ , 95% CI -14.201, -0.493,  $p=0.036$ ) showed a significant association with patients with osteoporosis.

## Conclusions

This study suggested that several important comorbidities, especially osteoporosis and diabetes, could influence on short-term functional outcomes in terms of the several performance-based and self-reported physical function in patients with 3 months after unilateral TKA.

Table 1. Demographic and Disease-Related Characteristics of the Subjects (N=140)

Variables	Values
Age (years)	72.3±5.8
Sex, males/females	22 (15.7) / 118 (84.3)
BMI (kg/m <sup>2</sup> )	25.9± 3.0
Comorbidities	
Osteoporosis	72 (51.4)
Sarcopenia	7 (5.0)
Degenerative spine disease	22 (15.7)
Diabetes mellitus	27 (19.3)
Hypertension	97 (69.3)

Values represent mean ± standard deviation or number (%) of cases

Abbreviations: BMI, Body Mass Index

Table 3. The Comparison of Performance-based Physical Function, Self-reported Physical Function, Quality of Life and Pain according to Comorbidities at 3 months after unilateral TKA

Variable	Osteoporosis		Diabetes		Hypertension		Sarcopenia		Degenerative spine disease	
	(+)	(-)	(+)	(-)	(+)	(-)	(+)	(-)	(+)	(-)
WOMAC-Pain	4.17±2.38	4.03±2.15	4.00±2.59	4.12±2.18	4.26±2.33	3.72±2.05	4.43±2.07	4.13±2.24	3.62±2.09	4.18±2.28
WOMAC-Stiffness	2.08±1.31	1.93±1.03	2.56±1.56	1.88±1.02	2.04±1.05	1.93±1.16	1.43±0.98	2.02±1.04	2.24±1.30	1.97±1.04
WOMAC-Function	17.28±8.80	16.31±8.64	16.48±9.81	16.92±8.43	17.25±8.64	15.91±8.79	19.14±8.84	17.11±8.65	15.33±8.97	17.10±8.64
6MWT (m)	414.44±99.80	460.82±101.69	423.33±92.79	439.24±105.56	435.68±104.65	437.21±100.70	442.86±90.46	442.32±103.41	424.05±89.61	438.31±105.50
TUG (sec)	9.69±1.90	8.85±1.64	9.34±1.65	9.29±1.88	9.40±1.77	9.07±1.96	9.80±2.01	9.23±1.85	9.56±1.53	9.25±1.88
SCT-ascent (sec)	11.68±4.32	9.94±3.30	11.23±4.53	10.87±3.97	11.10±4.24	10.59±3.55	10.16±3.53	10.83±4.09	11.40±2.87	10.86±4.20
SCT-descent (sec)	12.96±3.75	11.22±3.79	13.01±3.92	12.05±3.95	12.42±4.04	11.81±3.74	13.18±4.53	11.93±3.91	13.01±2.81	12.10±4.10
EQ-5D	0.82±0.90	0.82±0.90	0.82±0.11	0.82±0.08	0.81±0.09	0.83±0.08	0.80±0.08	0.82±0.09	0.82±0.09	0.82±0.09
Knee flexion ROM (°)	123.03±11.47	124.40±12.17	118.70±12.00	124.83±11.44	123.75±12.33	123.42±10.47	123.14±12.73	124.05±11.99	125.82±9.96	123.25±12.06
Knee extension ROM (°)	-7.25±5.15	-8.70±5.78	-9.37±6.12	-7.58±5.30	-8.07±5.68	-7.58±5.06	-6.71±3.99	-7.98±5.57	-10.27±5.69	-7.48±5.35
Gait Speed (m/sec)	1.12±0.21	1.18±0.22	1.10±0.17	1.25±0.96	1.25±1.04	1.15±0.20	1.06±0.12	1.24±0.92	1.11±0.19	1.24±0.94
Cadence (steps/min)	120.12±12.54	119.40±14.69	115.62±18.55	120.84±11.85	119.38±14.61	120.71±10.88	118.70±12.77	119.50±13.84	121.34±10.19	119.50±14.11
Stride length (cm)	109.83±17.03	115.54±24.57	107.45±27.38	113.82±19.12	111.80±22.96	114.21±16.25	108.14±15.61	114.10±19.08	105.32±27.94	113.96±19.30
PT of the extensor (N·m·kg <sup>-1</sup> ·BW%)	74.88±23.58	85.78±26.96	69.07±22.83	82.94±25.70	79.59±25.68	82.12±25.91	86.86±33.05	79.97±25.89	70.57±23.70	82.05±25.74
PT of the flexor (N·m·kg <sup>-1</sup> ·BW%)	52.28±14.92	53.55±15.11	49.44±11.86	53.51±14.57	52.92±15.06	52.26±11.91	58.00±14.69	51.72±14.07	54.05±14.38	52.46±14.14

Values represent mean ± standard deviation

\* p<0.05, † p<0.001

Abbreviations: TKA, total knee arthroplasty; WOMAC, Western Ontario McMaster Universities Osteoarthritis Index; 6MWT, 6-minute walk test; TUG, timed up and go test; SCT, stair climbing test; ROM, range of motion; EQ-5D, EuroQOL five dimensions; PT, peak torque

Table 4. Factors of Performance-based Physical Function, Self-reported Physical Function, Quality of Life and Pain associated with Comorbidities at 3 months after unilateral TKA.

Outcome/Independent predictor	Standardized (β)	p-value	Adjusted R <sup>2</sup>
WOMAC stiffness			0.076
Age	0.029	0.060	
Diabetes	0.719	0.002	
6MWT (m)			0.219
Age	-4.234	0.003	
BMI	-6.222	0.025	
Preoperative 6MWT	0.287	<0.001	
Osteoporosis	-56.469	0.001	
TUG (sec)			0.285
Sex	1.050	0.007	
Age	0.099	<0.001	
Preoperative TUG	0.151	0.001	
Osteoporosis	0.633	0.022	
SCT A (sec)			0.212
Age	0.128	0.021	
Preoperative SCT A	0.253	<0.001	
Osteoporosis	1.299	0.042	
SCT D (sec)			0.398
Sex	1.625	0.036	
Age	0.129	0.006	
Preoperative SCT D	0.338	<0.001	
Osteoporosis	1.054	0.053	
Knee flexion ROM (°)			0.228
BMI	-0.569	0.057	
Preoperative knee flexion ROM	0.456	<0.001	
Diabetes	-4.188	0.079	
Knee extension ROM (°)			0.209
Age	-0.190	0.011	
BMI	-0.249	0.082	
Preoperative knee extension ROM	0.332	<0.001	
Degenerative spine disease	-2.024	0.087	
PT of the extensor (N·m·kg <sup>-1</sup> ·BW%)			0.428
Sex	-20.315	<0.001	
Preoperative PT of the extensor	0.413	<0.001	
Diabetes	-8.419	0.056	
Osteoporosis	-7.347	0.036	

The Logistic Regression Analyses adjusting for age, sex, BMI

Abbreviations: WOMAC, Western Ontario McMaster Universities Osteoarthritis Index; 6MWT, 6-minute walk test; TUG, timed up and go test; SCT, stair climbing test; ROM, range of motion; EQ-5D, EuroQOL five dimensions; PT, peak torque