Quality of life before and after total knee arthroplasty in clinical settings across Lahore, Pakistan

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Abstract: Knee osteoarthritis is a common disabling condition that affects a larger number of populations aged above 40 years and this habitually required knee arthroplasty to reinstate leg function, to improve the pain as well as to improve stability. The main objective of this study was to determine the health-related quality of lifestyle before and after total knee arthroplasty. This study was a cross-sectional observational study conducted at Shaukat Khanum Memorial Cancer Hospital & Research Centre, HorizonHospital and Mayo Hospital, Lahore-Pakistan. In this study, 100 subjects were selected who were scheduled for Total Knee Replacement (TKR) due to advanced stages of knee osteoarthritis. Informed consent was taken from all selected patients. Selected subjects meeting inclusion and exclusion criteria were enrolled for this study. Subjects with any red flag signs or systemic illness were excluded. A baseline measurement was taken by using visual-analog scale (VAS) for pain, the Short Form 36 (SF-36) for health-related quality of life and The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) for disability. Measurements using these scales were repeated after 1, 3 and 6 months after knee arthroplasty. Analysis of variance (ANOVA) test was used to determine statistically significant changes in VAS, SF 36 and WOMAC Score across 06 months. A significant ($p<0.05$) improvement in health-related quality of life measured of two subscales of SF 36 (Physical Health Component and Mental Health Component) when before surgery readings were compared with that of after 06 months of surgery. Similarly, there was also significant ($p<0.05$) reduction in pain measured on VAS as well as reduced WOMAC score before and after 06 months of surgery. It could be concluded that TKA results in the improvementof the quality of life and reduced pain following total knee arthroplasty.

Keywords: Health-related quality of life, knee osteoarthritis, total knee arthroplasty, improvement.

INTRODUCTION

Physiotherapy can provide effective interventions for individuals with knee osteoarthritis (OA), but not all individuals with knee OA osteoarthritis. There is strong evidence that exercise therapy in a subjectparticularly produces good outcomes for patients with knee OA (Roddy *et al.*, 2005), while there is growing evidence that adding manual therapy is also beneficial (Deyle *et al*., 2000). However, effect sizes from pooled data are small to moderate (Jansen *et al.*, 2011). Modest effect sizes may be due to sub-groups within study samples responding differently to treatment. For example, knee joint alignment or laxity in patients with knee OA may alter the response to exercise therapy, suggesting treatment should be tailored to individuals or sub-groups (Sharma *et al*., 2003). It has been argued that identifying patients more likely to respond to specific interventions would improve treatment outcomes (Hancock *et al.,* 2009). Osteoarthritis of the knee is a common disease with a prevalence of 12.5% in populations over forty-five years of age (Zhang and Jordan, 2010). As OA tends to increase with age and there is demographic aging of the population in New Zealand and many other Western countries, there is a projected increase in prevalence. Furthermore, the lifetime risk of developing symptomatic knee OA is estimated as 44.7% (Murphy *et al.,* 2008). The disease affects the quality of life and contributes to disability, as well as being a considerable and growing economic burden to society. The size of the problem heightens the importance of developing and utilizing effective treatments and management strategies for individuals suffering from knee OA. The problem is further exacerbated by the heterogeneity of the disease resulting in a wide variety of clinical presentations (Zhang and Jordan, 2010)

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MATERIALS AND METHODS

It was a qualitative cross-sectional study. This study was conducted by a content questionnaire including those patients who had TKR at Horizon hospital, Shaukat Khanum Memorial Cancer Hospital & Research Centre and Mayo hospital, Lahore-Pakistan. All those patients diagnosed with osteoarthritis (more than 45 Years old) and were given TKR appointment after 3 months were selected. Patients with any red flags i.e. Rheumatoid arthritis, Parkinson disease, Stroke and Infective arthritis were excluded from the study. All patients were connected and asked about their issues and problems and evaluated by SF-36 and VAS. Change in quality of life was assessedby using SF-36 and VAS after baseline,1 3 and then 6 months. ANOVA was used to evaluate the results statistically by (SPSS version 12 trial version) and a p-value less than 0.05 was considered significant.

Ethical approval

This study was approved by the Ethical Committee of the Indus Hospital, Muzaffargarh, Pakistan

RESULTS

Total 120 patients were contacted but only 100 patients (54 males and 46 females) were responded, having mean age 53.75. The mean BMI of participants was 25.5007kg/m^2 with a minimum BMI of 17.35kg/m^2 and a maximum BMI of 34.40kg/m^2 (table 1). Out of a total of 100 participants, 37% with right side knee replacement, 56% left-sided knee replacement and 7% with both knee replacement. tables 1 and 2 provides clear results showing significant values in comparison. Table 2 PostHoc tests using the Bonferroni correction were applied for pairwise comparison of pain measured on the visualanalog scale (VAS), between two consecutive readings taken at baseline, at the end of month 1st, 3rd& 6th month. There was a significant reduction in pain score measured between the two consecutive readings with p-value< 0.05.

Table 3 Post-Hoctests using the Bonferroni correction were applied for pairwise comparison of SF 36 Physical Health Component, between two consecutive readings taken at baseline, at the end of month 1st, 3rd& 6thmonth. There was significant improvement in SF 36 physical

Table 1: Distribution of height, weight and BMI of participants (n=100)

Descriptive Statistics				
	Minimum	Maximum	Mean	SD
Height (m)	1.52	1.85	1.7535	± 0.04753
Weight (kg)	55.00	98.00	78.0900	± 9.59071
BMI (kg/m^2)	17.35	34.40	25.5007	± 3.26064
Valid N (listwise)				

Table 2: Pairwise comparison of VAS score change

Pairwise Comparisons						
Measure:MEASURE_1						
(I) VAS	(J) VAS	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
1	2	2.550*	.184	.000	2.055	3.045
	3	4.410*	.178	.000	3.932	4.888
	4	5.850*	.160	.000	5.420	6.280
2	1	-2.550*	.184	.000	-3.045	-2.055
	3	1.860*	.184	.000	1.365	2.355
	4	3.300*	.143	.000	2.914	3.686
3	1	-4.410*	.178	.000	-4.888	-3.932
	2	-1.860*	.184	.000	-2.355	-1.365
	4	1.440*	.138	.000	1.068	1.812
4	1	-5.850*	.160	.000	-6.280	-5.420
	2	-3.300*	.143	.000	-3.686	-2.914
	3	-1.440*	.138	.000	-1.812	-1.068
Based on estimated marginal means						
*. Significant (p<0.05)						

Table 3: Pairwise comparison of 36 physical health component score change

Pairwise Comparisons						
Measure: MEASURE_1						
(I) SF 36.PhysicalHealth	(J) SF36.PhysicalHealth	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	-13.590*	.746	.000	-15.599	-11.581
	3	-29.320*	.733	.000	-31.293	-27.347
	4	-44.210*	.483	.000	-45.511	-42.909
2	1	13.590*	.746	.000	11.581	15.599
	3	-15.730*	.884	.000	-18.111	-13.349
	4	-30.620*	.808	.000	-32.795	-28.445
3	1	29.320*	.733	.000	27.347	31.293
	2	15.730*	.884	.000	13.349	18.111
	4	-14.890*	.781	.000	-16.993	-12.787
4	1	44.210*	.483	.000	42.909	45.511
	2	30.620*	.808	.000	28.445	32.795
	3	14.890*	.781	.000	12.787	16.993
Based on estimated marginal means						
*Significant (p<0.05)						
a. Adjustment for multiple comparisons: Bonferroni.						

Table 4: Pairwise comparison of WOMAC score change

Pairwise comparisons						
Measure: MEASURE_1						
(I) WOMAC	(J) WOMAC	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
1	2	13.350*	.753	.000	11.322	15.378
	3	27.440*	.671	.000	25.634	29.246
	4	43.550*	.532	.000	42.117	44.983
2	1	-13.350*	.753	.000	-15.378	-11.322
	3	14.090*	.866	.000	11.758	16.422
	4	30.200*	.668	.000	28.401	31.999
3	1	-27.440*	.671	.000	-29.246	-25.634
	2	-14.090*	.866	.000	-16.422	-11.758
	4	16.110*	.639	.000	14.389	17.831
4	1	-43.550*	.532	.000	-44.983	-42.117
	2	-30.200*	.668	.000	-31.999	-28.401
	3	-16.110*	.639	.000	-17.831	-14.389
Based on estimated marginal means						
*Significant (p<0.05)						
a. Adjustment for multiple comparisons: Bonferroni.						

health component score measured between the two consecutive readings with p-value< 0.05.

Table 4 Post-Hoc tests using the Bonferroni correction were applied for pairwise comparison of WOMAC score, between two consecutive readings taken at baseline, at the end of month 1st, 3rd& 6th month. There was a significant reduction in WOMAC score measured between the two consecutive readings with p-value< 0.05.

DISCUSSION

The aim of this study was to determine health-related quality before and after total knee replacement. This study found significant (p<0.05) improvement in health-related quality of life measured of two subscales of SF 36 (Physical Health Component and Mental Health Component) where before surgery readings as compared with after 06 months of surgery. Similarly, there was also a significant reduction in pain measured on VAS after 06 months of surgery. WOMAC score also illustrated a significant reduction when measured before and after surgery. Patients with knee OA may opt for, or be referred to, physiotherapy for a variety of reasons including personal preference, doctor preference, the presence of comorbidities limiting other treatment options or rationed access to specialist clinics or surgery (Ballantyne *et al*.,

2007). Frequently physiotherapists are obligated to provide treatment and may not have the option to deny treatment based on the presence or absence of predictive variables. Therefore, the evaluation of treatment response provides additional information, which could contribute to the prediction of long-term outcome. A secondary analysis was performed to determine whether an immediate response on completion of the treatment was a predictor of successful outcome at one year. Siddiq and Qayum, (2006) investigated that TKA with I-B-II prosthesis was a beneficial and safe procedure if an expert surgeon carefully operates the patient. They also explained that TKA is a good technique to restore the functionality of OA patients. Moreover, different studies also explained the importance of TKA which significantly improve the life's quality by reducing the pain and by improving the functionality. Further, it was also reported that there are some factors including advanced age, obesity, comorbidities as well as continuous pain even after the procedure and too much delay for surgery which havenegative impact (*da Silva et al.,* 2014). Krummenauer *et al.*, (2009) found that total knee replacement arthroplasty is a cost-effective procedure but its effectiveness correlates with age of the patient. It was also found that this age-related gradient in marginal cost-effectiveness is of comparable order as the changes in cost-effectiveness due to the variation of the underlying assessment instrument.

CONCLUSION

Knee osteoarthritis is a common disabling condition that affects a larger number of populations aged above 40 years and this habitually require knee arthroplasty to reinstate leg function, to improve the pain as well as to improve stability. It could be concluded that TKA effectively improves the quality of life of patients by reducing the pain and enhancing the functionality of OA patients. These improvements are also evident in the personal, social and mental sphere of life of the patients. Although, TKA have a significant role in improving the quality of life still there are some factors like age, other associated disorders, and obesity which hashas negative impact on the applications and outcome of this technique. So further techniques, as well as strategies, are required to replace the hurdles for making TKA more success able.

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