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QUALITY OF LIFE ASSESSMENT IN ANTERIOR CRUCIATE LIGAMENT INJURY PATIENTS

Orthopaedics

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ABSTRACT

Aim: To assess the Quality of Life of patients with Anterior Cruciate Ligament (ACL) injuries at a centre in Central India. **Methods:** A total of 122 ACL injury patients were enrolled in the study. Demographic data, mode of injury, body mass index and clinical presentation was noted. Extent of disability was assessed using Tegner score categorized as severe (<5), moderate (6-7) and mild (>7) respectively. Quality of life assessment at the time of presentation was made using 31-item Anterior Cruciate Ligament Quality Of Life Questionnaire. Domain and total QoL scores transformed to 100-scale were used for assessment. SPSS 17.0 was used to analyse the data. Chi-square and Independent samples 't'-tests were used to compare the data. **Results:** Age of patients ranged from 18 to 54 years. Maximum patients (44.3%) were aged 18-25 years. Mean age was 29.18±8.64 years. Majority of patients were males (78.7%), had moderate disability (60.6%), unilateral (91%) involvement and moderate pain (93.4%). Sports injuries (73%) were the major cause. Mean time gap between injury and clinical presentation was 11.24±8.21 months. Maximum QoL scores were seen for Lifestyle domain (44.36±19.37) while minimum were seen for recreation/sports domain (39.37±19.72). Total QoL score was 41.85±10.90. All the domain scores had significant correlation with total scores ($p<0.05$). Strongest correlation of total scores was observed with lifestyle scores ($r=0.653$; $p<0.05$). No significant association of total QoL scores was observed with age, sex, BMI, type of injury and time delay but disability level and laterality showed a significant association with total scores. Conclusion: ACL injuries cause a significant reduction in QoL which seems to be affected by severity of disability and laterality.

KEYWORDS

Anterior cruciate ligament injuries, Sports, Quality of Life, Anterior Cruciate Ligament Quality Of Life Questionnaire, Correlation.

INTRODUCTION

Anterior cruciate ligament (ACL) injuries primarily affect the athletes, sportspersons and physically active persons[1,2]. Occurrence of these injuries results in untimely break or culmination of a sports career, experience of both physical as well as psychological pain, difficulties in meet up occupational commitments and routine tasks leading to a decay in quality of life of affected individuals[3,4]. In societies like India where sports injuries are considered to be an end of the career and excepting a few sports like Cricket and Hockey, sportspersons and athletes experiencing ACL injuries are left to their destiny only. Owing to lack of appropriate facilities for management of ACL injuries, affected patients often remain untreated for their problem for a long time. Despite not being life-threatening and having less major impact on basic tasks of life, the treatment is delayed but still patients experience a great physical and psychosocial agony manifested in terms of declining quality of life. In present study we make an attempt to assess the quality of life issues in untreated ACL injury patients.

MATERIAL AND METHOD

The present study was conducted on ACL injury patients over the last three years between January 1, 2017 to December 31, 2019 at a tertiary care centre in Central India. All patients with ACL injury aged >18 years were enrolled in the study. Patients presenting with concomitant bone injuries, ACL injuries due to trauma and incomplete information were excluded.

Demographic data *viz.* age and sex was noted, details related with body mass index, type of injury (sports, occupational, other modes) and side of involvement (unilateral/bilateral) were noted. Estimation of level of disability was done using Tegner activity scale (TAS)[5]. Quality of life assessment at the time of presentation was made using 31-item Anterior Cruciate Ligament Quality Of Life Questionnaire[6]. Domain and total QoL scores transformed to 100-scale were used for assessment.

Data so collected was fed into computer using Microsoft Excel 2013 software. Data was analysed using Statistical Package for Social Sciences (SPSS) version 17.0. Inter-domain correlation of QoL scores and correlation of QoL scores with total scores was done using Pearson Correlation Coefficient. Association of different clinicodemographic variables with total QoL scores was done using Independent samples and ANOVA tests. A 'p' value less than 0.05 was considered to be statistically significant.

RESULTS

A total of 122 patients falling in sampling frame were identified. Age of patients ranged from 18 to 54 years. Maximum number of patients were aged 18-25 years (44.3%) followed by those aged 26-35 years (35.2%) and 36-46 years (15.6%) respectively. Only 6 (4.9%) patients were aged >45 years. Mean age of patients was 29.18±8.64 years. Majority of patients were males (78.7%). The sex ratio (M:F) was 3.69. Body mass index (BMI) of patients ranged from 18.5 to 27.9 kg/m^2. Nearly three quarter (74.6%) patients had BMI in 18.5-24.9 kg/m^2 (normal weight) category while remaining 31 (35.4%) had BMI in 25.0-29.9 kg/m^2 (overweight) range. Mean BMI of patients was 23.06±2.37 kg/m^2. Majority of patients had moderate disability (60.6%) followed by those having severe disability (32.8%) and mild disability (6.6%) respectively. Sports (73.0%) was the most common cause/type of injury followed by occupational injuries (11.5%). A total of 19 (15.6%) had other causes of injury. Most the cases (91%) had unilateral injury. A total of 11 (9%) had bilateral injury. Time gap between injury and presentation ranged from 3 to 36 months. Maximum (44.3%) presented between 7 and 12 months followed by those presenting within 6 months (33.6%), between 13 and 4 months (16.4%) and >24 months (5.7%) respectively. Mean time gap was 11.24±8.21 months. For different domains mean QoL scores ranged from 39.37±19.72 (Recreation activities and sports participation) to 44.36±19.37 (Lifestyle) thus showing a high impairment in quality of life of patients for all domains. Mean total QoL score was 41.85±10.90. (Table 1).

All QoL domain scores showed a significant correlation with total QoL scores. The domain scores of lifestyle had strongest correlation with total QoL scores ($r=0.653$; $p<0.05$) while domain scores for physical QoL showed least correlation with Total QoL scores ($r=0.440$; $p<0.05$). Between different domains, scores for work domain showed a significant correlation with recreation/sports ($r=0.193$) and lifestyle ($r=0.257$). Lifestyle domain scores also showed a significant correlation with scores for social/emotional domain ($r=0.314$) (Table 2).

No significant association of total QoL scores was observed with age, sex, body mass index, type of injury and time gap between injury and presentation. However, with increasing disability, a significant decrease in QoL was observed ($p<0.001$). Similarly, those having bilateral involvement experienced significantly lower QoL scores as compared to those having unilateral involvement ($p=0.003$) (Table 3).

DISCUSSION

Anterior Cruciate Ligament Quality Of Life Questionnaire measures quality of life of patients with ACL injury on six domains namely symptoms and physical, work-related concerns, recreation activities and sports participation, lifestyle and social/emotional life. For each domain the maximum score could be 100 indicating the best possible

quality of life and score 0 indicates worst possible quality of life[6]. In present study, for different domains mean QoL scores ranged from 39.37±19.72 (Recreation activities and sports participation) to 44.36±19.37 (Lifestyle) thus showing a high impairment in quality of life of patients for all domains. Mean total QoL score was 41.85±10.90. Most of the assessments done previously have been done following ACL reconstruction and there are very limited studies measuring the QoL at the time of presentation. Compared to present study where mean total QoL score was 41.85±10.90, Lafave *et al.*[7] reported the QoL scores at presentation to be much lower at 26.7±13.7 thus depicting a high decline in quality of life. The findings indicate that quality of life is impaired substantially following ACL injury. In another study, Ahlden *et al.*[8] using Knee injury and Osteoarthritis Outcome Score (KOOS) reported mean preoperative QoL scores as 33.7±18.6. In fact, QoL is highly impaired in ACL patients as being an athlete and sportsperson they often have a lot of their expectations attached with their physical fitness and performance. Moreover, having a shorter sports-lifespan the passage of time away from field affects their physical fitness as well as psychosocial health. The same could be seen by inter-domain correlation and its holistic effect in toto could be seen in terms of their correlation with total QoL scores.

The present study did not show a significant association of demographic and anthropometric factors like age, sex and BMI with QoL scores. However, level of disability (Tegner score) was found to be significantly associated with quality of life. Bilateral involvement was also found to be significantly associated with poor quality of life scores. These findings indicated that extent and magnitude of disability had a significant impact on the quality of life of patients. In their study Ott *et al.*[9] also did not find effect of age and sex on quality of life of ACL injury patients, though in females they found trends indicative of lower scores associated with younger age, however this association was not significant statistically. In present study, we observed that with passage of time the quality of life scores showed an improvement till 24 months, however, subsequently they showed a decline. Despite these trends being non-significant they tend to indicate the fact that with the passage of time the acceptability to physical limitations increases and patients tend to find alternate ways to balance their quality of life despite physical limitations. However, this balancing act might have its saturation too, leading to a fall in quality of life with the problem becoming chronic, thus indicating that the balance between alternative strategies to balance the quality of life cannot be continued for so long and thus the patients require a reconstructive rehabilitation.

The findings of present study showed that quality of life of ACL injury patients is highly impaired and is primarily affected with the level of physical disability and magnitude of disease. The present study is perhaps the first study evaluating the quality of life in ACL injury patients who have not undergone reconstructive procedure as yet. Further studies to evaluate the change in quality of life of patients following reconstructive surgery are warranted.

CONCLUSION

ACL injury Patients in our settings do not go reconstructive procedure for prolonged periods despite these injuries having a substantial impact on quality of life. The quality of life of ACL injury patients is primarily dependent on the extent of disability and magnitude of disease.

Table 1: Demographic Profile and Clinical Profile of ACL Injuries Patients (n=122)

SN	Characteristic	Statistic
1.	Age (in years)	
	18-25 Years	54 (44.3%)
	26-35 Years	43 (35.2%)
	36-46 Years	19 (15.6%)
	>45 Years	6 (4.9%)
	Mean age±SD (Range) in years	29.18±8.64 (18-54)
2.	Sex	
	Male	96 (78.7%)
	Female	26 (21.3%)
3.	Body Mass Index (kg/m2)	
	18.5-24.9 (Normal weight)	91 (74.6%)
	25.0-29.9 (Overweight)	31 (35.4%)
	Mean BMI±SD (Range) kg/m2	23.06±2.47 (18.5-27.9)
4.	Tegner Score at presentation	
	Mild disability (>8)	8 (6.6 %)
	Moderate disability (6-8)	74 (60.6%)
	Severe disability (<5)	40 (32.8%)
5.	Type of injury	
	Sports	89 (73.0%)
	Occupational	14 (11.5%)
	Others	19 (15.6%)
6.	Laterality	
	Unilateral	111 (91.0%)
	Bilateral	11 (9.0%)
7.	Time gap between injury and presentation	
	<6 months	41 (33.6%)
	7-12 months	54 (44.3%)
	13-24 months	20 (16.4%)
	>24 months	7 (5.7%)
	Mean time gap±SD (Range) in months	11.24±8.21 (3-36)
8.	QoL Scores (Mean±SD)	
	Symptoms and Physical	42.34±17.63
	Work-related concerns	41.42±19.22
	Recreation activities and Sports Participation	39.37±19.72
	Lifestyle	44.36±19.37
	Social and Emotional	41.76±19.81
	Total	41.85±10.90

Table 2: Correlation between different domains and Total QoL Scores (Pearson Correlation Coefficient)

Domain	Domain					
	Physical	Work	Recreation/ Sports	Lifestyle	Social/ Emotional	Total
Physical	1	0.093	0.025	0.123	0.084	0.440*
Work		1	0.193*	0.256*	0.169	0.605*
Recreation/ Sports			1	0.147	0.118	0.533*
Lifestyle				1	0.314*	0.653*
Social/ Emotional					1	0.604*
Total						1

*Statistically significant at p<0.05

Table 3: Association of Total Quality of Life Scores with different clinicodemographic variables (n=122)

SN	Characteristic	Total QoL Scores		
		Mean	SD	'p' value
1.	Age (in years)			0.899
	18-25 Years (n=54)	41.81	12.08	
	26-35 Years (n=43)	42.24	9.69	
	36-46 Years (n=19)	42.12	9.82	
	>45 Years (n=6)	38.60	13.30	
2.	Sex			0.562
	Male (n=96)	42.15	11.42	
	Female (n=26)	40.75	8.83	
3.	Body Mass Index (kg/m2)			0.641
	18.5-24.9 (Normal weight) (n=91)	42.12	10.74	
	25.0-29.9 (Overweight) (n=31)	41.06	11.49	
4.	Tegner Score at presentation			<0.001
	Mild disability (>7) (n=8)	55.18	5.78	
	Moderate disability (6-7) (n=74)	45.88	7.68	
	Severe disability (<5) (n=40)	31.74	8.94	

5.	Type of injury			0.368
	Sports (n=89)	41.31	11.33	
	Non-sports (n=33)	43.32	9.64	
6.	Laterality			0.003
	Unilateral (n=111)	42.75	10.76	
	Bilateral (n=11)	32.80	7.95	
7.	Time gap between injury and presentation			0.189
	<6 months (n=41)	40.45	10.69	
	7-12 months (n=54)	44.20	10.89	
	13-24 months (n=20)	48.95	11.91	
	>24 months (n=7)	40.20	6.41	

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