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Original Research Article

Clinical and epidemiological profile of the patients with anterior cruciate ligament tear attending a tertiary care hospital at Srinagar

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ABSTRACT

Background: Anterior cruciate ligament (ACL) is the most frequently injured knee ligament especially as regards sports that include movements with sudden direction changes as knee supports body weight during them. The ACL is crucial in stabilizing the knee joint. The objective of the study was to describe the general and clinical profile of the patients having ACL tear.
Methods: This was a hospital based cross-sectional observational study. It was conducted on patients with ACL tear presenting to the department of orthopaedics SKIMS medical college and hospital Bemina from-December 2019 to June 2021. Information was obtained about the general characteristics and clinical profile of the patients. Knee stability was assessed by stability tests, Lysholm knee scoring and international knee documentation committee (IKDC) scale.
Results: Of the 40 patients, 50% belonged to the age-group of 31-50 years, 90% were males and 57.5% (n=23) were from rural areas. Sports injury was most common 35%. Giving way was the most common presenting symptom (100%) followed by locking (57.5%). Maximum patients 25(62.5%) had a score of 2 for manual Lachman grading, anterior drawer test 28 (70%) and Pivot shift grading 21(52.5%) whereas for Tegner activity level 23 (57.5%) had a score of 3. The mean Lysholm knee scoring was 64.65±6.82 and the mean IKDC scoring was 51.88±6.70.
Conclusions: ACL injury is mostly found in young people with active lifestyle. Sports related activities and road traffic accidents are the most common cause of ACL injury. Giving way and locking of the knee are the most common symptoms.

Keywords: ACL, Injury, Symptom, Stability, Sports

INTRODUCTION

The cruciate ligaments of the knee have been known since old Egyptian times. The first recorded description of rupture of the ACL was by Stark in 1850.[1] The ACL deficient knee can suffer from repeat instability, intra-articular damage, meniscal injuries and chondral injuries.[2] The ACL is the most frequently injured knee ligament especially as regards sports that include movements with sudden direction changes as knee supports body weight during them.[3] The knee joint becomes very unstable when the ACL is torn, because the ACL is crucial in stabilizing the knee joint. Without surgical reconstruction the ACL deficient knee is limited in performing normal function. The ACL deficient patient has repeated episodes of instability and will sustain meniscal tears and osteo-chondral injuries that eventually lead to osteoarthritis. Reports of meniscal injury associated with acute ACL disruption range from 15% to 40%.[4] The prevalence of reported OA after ACL injury ranges between 10 and 90%.[5] Nowadays there is a better understanding of ACL anatomy and now we have a more accurate description of insertions of its 2 bundles, femoral and tibial.[6] Resultantly, the management of ACL tear has evolved over the recent decades. Objective of this study was to describe general and clinical profile of patients having ACL tear.

METHODS

This was a hospital based cross-sectional observational study. It was conducted on 40 patients with ACL tear presenting to the out-patient department of orthopaedics SKIMS medical college and hospital Bemina from-December 2019 to June 2021.

Inclusion criteria

ACL tear with clinical and MRI correlation, patients more than 18 years of age and patients who provide written informed consent.

Exclusion criteria

PCL tear (as we wanted to find the correlates of isolated ACL injury). Associated osteoarthritis (as it might affect the clinical presentation), comorbid conditions like diabetes, rheumatoid arthritis, ACL injury associated with MCL, LCL, and posteromedial or posterolateral capsule tears alone/in combination, mentally subnormal persons.

All patients were assessed by a standard protocol. Information was obtained about the general characteristics and clinical profile of the patients. Knee stability was assessed by stability tests (Manual Lachman test, anterior drawer test, Pivot shift grading) and Lysholm Knee scoring and IKDC scale. Informed consent was taken from all the participants.

Data was entered in Microsoft excel 2010 and analysed using SPSS version 23.

Ethical approval obtained from institutional ethical committee.

RESULTS

A total of 40 patients were enrolled in the study. Table 1 gives the general characteristics of the study participants.

Majority (n=20, 50%) of the study participants belonged to the age-group of 31-50 years followed by 17 (72.5%) who were in the age-group of 18-30 years.

There was a male preponderance with 36 (90%) males in our study. Most of the participants were from rural areas (n=23, 57.5%). A total of 17 (42.5%) of the participants were either graduates or post-graduates with respect to their educational qualification whereas 10 (25%) of the participants had passed the senior secondary exams.

Majority of the participants (n=16, 40%) had their own business or were doing a private job followed by 14 (35%) of the participants who had a government job.

With respect to the family income, majority 17 (42.5%) had a monthly family income of Rs. 20001 to 40000 followed by 16 (40%) who had a monthly family income of up to Rs. 20000.

With respect to BMI, most of participants 20 (50%) were overweight and 2 (5%) were obese while rest were normal.

Table 2 shows characteristics of ACL injury in our study participants.

The most common mode of injury to the ACL in our study was a sports injury reported by 14 (35%) patients (with football being the most common sports injury in 9 (22.5%) of the study participants) followed by road traffic accident in 12 (30%) and skid on a surface (n=8, 20%). Assault, injury while playing cricket, impact due to a heavy object and a fall from stairs accounted for 5% of the injuries each.

In terms of presenting symptoms, giving way was the most common symptom present in all 40 (100%) of the patients followed by locking with 23 (57.5%) of the patients complaining of locking and pain which was reported by 20 (50%) of the patients.

In study 36 (90%) injuries due to non-contact mechanism.

In majority of patients, side of injury was right side (n=23, 57.5%).

The location of the tear was femoral in 50% of the patients and middle-third in another 50%. Meniscal injury was found associated in 30(75%) of the patients. Medial meniscus was involved in 25(83.3%) of the patients.

Table 1: General characteristics of the study subjects.

Variables		N (%)
Age-group (years)	18-30	17 (42.5)
	31-50	20 (50)
	≥51	3 (7.5)
Gender	Male	36 (90)
	Female	4 (10)
Residence	Rural	23 (57.5)
	Urban	17 (42.5)
Education	No formal schooling	6 (15)
	8^{th}	4 (10)
	10^{th}	3 (7.5)
	12^{th}	10 (25)
	Graduate or post-graduate	17 (42.5)
Occupation	Government employee	14 (35)
	Business/private job	16 (40)
	Unemployed	10 (25)
Income (INR)	≤20000	16 (40)
	20001-40000	17 (42.5)
	≥40001	7 (17.5)
BMI (Kg/m^2)	18.5 to 24.9	18 (45)
	25.0 to 29.9	20 (50)
	30.0 to 34.9	2 (5)

Mean age=34.03(±11.5) years, Median age=32.50 years, Range=18-65 years.

Table 2: Characteristics of the anterior cruciate ligament injury.

Variables		N (%)
Mode of injury	Sports injury	14 (35)
	Assault	2 (5)
	Impact due to a heavy object	2 (5)
	RTA	12 (30)
	Skid	8 (20.0)
	Stair fall	2 (5.0)
Presenting symptoms	Giving way	40 (100)
	Locking	23 (57.5)
	Pain	20 (50)
Type of injury	Contact	4 (10)
	Non-contact	36 (90)
Side of injury	Left	17 (42.5)
	Right	23 (57.5)
Location of tear	Femoral	20 (50.0)
	Middle third	20 (50.0)
Meniscal injury	No	10 (25)
	Yes	30 (75)
Meniscus involved	Medial	25 (83.3)
	Lateral	2 (6.7)
	Both	3 (10)

Table 3: Clinical presentation of the anterior cruciate ligament injury.

Variables		N	Percentages (%)
Manual Lachman grading	1	10	25
	2	25	62.5
	3	5	12.5
Anterior drawer test	1	4	10
	2	28	70
	3	8	20
Pivot shift grading	1	19	47.5
	2	21	52.5
Tegner activity level	2	15	37.5
	3	23	57.5
	4	2	5
Lysholm knee scoring (Mean, SD)		64.65 (6.82)	
IKDC (Mean, SD)		51.88 (6.70)	

Table 3 shows clinical presentation of patients with ACL injury.

Maximum patients 25 (62.5%) had a score of 2 for manual Lachman grading. For anterior drawer test 28 (70%) had a score of 2. For Pivot shift grading 21 (52.5%) had a score of 2 whereas for Tegner activity level 23 (57.5%) had a score of 3. The Lysholm knee scoring had a mean of 64.65 and a standard deviation of 6.82. On IKDC (International knee documentation committee) scale the mean was 51.88 and the standard deviation was 6.70.

DISCUSSION

In our study, majority (n=20, 50%) of the study participants belonged to the age-group of 31-50 years followed by 17 (72.5%) who were in the age-group of 18-30 years. Mean age was 34.03 (±11.5) years. This can be attributed to the active lifestyle of this age-group especially their participation in sports activities. Mulcahey et al and List et al reported the mean age of patients with ACL injury to be 29.9 years and 37 years respectively.[7]

There was a male preponderance with 36 (90%) males in our study. This can also be because in this part of the world there's limited participation of females in sports related activities. Studies have found more participation of males in sports related activities even in developed world.[8]

Most of the participants were from rural areas (n=23, 57.5%). This could be because of the fact that most of the catchment area of the hospital where the study was carried out is rural e.g., Budgam, Baramulla, Ganderbal and Bandipora.

Most of the participants had a good education level with a total of 17 (42.5%) of the participants being either graduates or post-graduates whereas 10 (25%) of the participants had passed the senior secondary exams. It could be because the educated class is usually more health conscious and therefore seek medical attention for their problems. Positive association between education and health seeking behaviour has been well established.[9,10]

With respect to BMI, most of the participants 22 (55%) were overweight or obese while the rest were normal. There is a rising trend of obesity and overweight throughout India as well as in Kashmir.[11,12] Moreover ACL tear has been found to be more common in overweight and obese group.[13]

The most common mode of injury to the ACL in our study was a sports related injury 14 (35%, football, cricket and volleyball) followed by road traffic accidents in 12 (30%) of the study participants. In a study conducted by Ristic et al conducted in 2010 it was found that sports related injuries formed the major cause (88%) of the ACL tear.[14] However, our study also reports road traffic accidents as one of the major causes of ACL injury. This might be due to the fact that in Kashmiri society road traffic accidents are very common. A study conducted at Jawahar Lal Nehru hospital also reports RTA as the major cause of ACL injury.[15] A study by Chaudhary et al at Safdarjund hospital New Delhi also reports RTA to be the cause of ACL injury in 30.8% of the cases.[16]

Giving way was the most common symptom present in all 40 (100%) of the patients followed by locking with 23 (57.5%) of the patients complaining of locking and pain which was reported by 20 (50%) of the patients. These are the commonly reported symptoms reported in ACL injury.[17-19]

In our study 36 (90%) injuries were due to non-contact mechanism. Literature also suggests that most ACL injuries are due to non-contact mechanism.[20]

In our study the location of tear was femoral in 50% and middle-third in 50%. A review article by Ng et al and a study by Kam et al suggest the occurrence of medial third tears to be more common.[21,22]

Our study shows that meniscal injury was found associated in 30 (75%) of the patients with medial meniscus being involved in 25 (83.3%). Studies suggest that delaying treatment for ACL tear results in associated meniscal injuries.[23,24] In a study by Chaudhary, medial meniscus injury was most commonly associated in 25(37.9%) cases.[16]

Maximum patients 25 (62.5%) had a score of 2 for Manual Lachman grading. The results found in a study by Eriksson et al are comparable with our study.[25] Su et al reported that at presentation, majority 25 (80.6%) of the patients had a score of 3 while.[26]

For anterior drawer test 28 (70%) had a score of 2 and for Pivot shift grading 21 (52.5%) had a score of 2. For Tegner activity level 23 (57.5%) had a score of 3. A study by Eriksson et al shows 34 (59.6%) had a score of 2 for anterior drawer test and median TAL to be 2 at presentation.[25]

The Lysholm knee scoring had a mean of 64.65 and a standard deviation of 6.82. Liden et al found that the score was 68 at presentation.[27] Su et al reported that the mean Lysholm score was 47.3±12.8 at presentation.[26]

On IKDC scale the mean was 51.88 and the standard deviation was 6.70. Su et al reported that the mean IKDC score was 49.5±10.6 at presentation.[26]

Limitations

The sample size was less. More accurate results would be obtained if the sample size was more. But the sample depended on the number of patients presenting to the OPD. Due to COVID-19 pandemic the number of patients presenting to the department was low because of lockdown and restrictions on social mobility.

CONCLUSION

ACL injury is mostly found in young people with active lifestyle. Sports related activities and road traffic accidents are the most common cause of ACL injury. Most ACL injuries are due to non-contact mechanism. Giving way and locking of the knee are the most common symptoms. The grading of ACL injury can be done by clinical tests like Manual Lachman test, Anterior drawer test, pivot shift grading. The scoring can also be done by Lysholm knee scoring and IKDC scale.

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