Epidemiological Characteristics of Arthroscopically Managed Anterior Cruciate Ligament Injuries in A Tertiary Care Center of South India

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ABSTRACT:

Background: We intend to study the demographic characteristics variations in arthroscopic Anterior Cruciate Ligament reconstruction in the South Indian population

Materials and Methods: In this prospective randomized study, 50 patients with ACL tears underwent arthroscopic ACLR. The purpose of this study was to study various associated demographic features.

Results: Age of the patients ranged from 23 to 45 years. Maximum patients (44.3%) were aged 31-40 years. The mean age was 25.18±5.64 years. The majority of patients were males (80%) and 20% were women. With regards to ACL tear grading, a maximum of 34 patients in GRADE 3 (68%) and 16 patients in GRADE 2 (32%). The maximum no of patients with the affected side was on the right 30 (60%) and 20 patients affected on the left (40%). Regarding occupation, 40% of patients were involved in light office/housework, 33% were recreational sports persons and 27 % were labour workers. A total of 26 patients sustained RTA (52%) and 24 patients got injured by reactional/ sports activity (48%). The clicking of the knee was appreciated by 60% of the patients. The swelling was evident in 36% of the patients, and discomfort was present in 80% of the cases.

Conclusion: These demographic data can help identify individuals who are at risk of ACL injury and who may benefit from injury prevention programs. ACL injuries in the young population were the most common cause with differences in epidemiology affected by gender and mode of injury.

Conflict of interest: None

Level of Evidence: Level 2

INTRODUCTION:

Anterior Cruciate Ligament (ACL) ruptures are among the most commonly studied injuries in orthopaedic research [1]. Twisting injuries from car accidents and sports activities have led to an increase in knee ligament damage. Many techniques, from open to arthroscopic, have been used to document ACLR [2]. Even though arthroscopic ACL reconstruction is frequently used to treat ACL injuries, there aren't many research studies from South India that examine the epidemiology of knee injuries in these patients. However, substantial research exists in the Western literature regarding the impact of epidemiology on ACL injury.[3, 4, 5] This study sought to investigate the many epidemiologic factors associated with ACL injury in the population of South India. To create recommendations for the treatment and prevention of knee injuries in sports, these statistics are crucial.

MATERIALS AND METHODS

All of the patients were evaluated clinically and radiologically before undergoing anterior cruciate ligament reconstruction surgery at Narayana Medical College in the orthopaedics department.

SAMPLE SIZE: A minimum of 50 cases were studied after clearance from the Ethics committee

STUDY PERIOD: This study includes patients from August - 2019 to March – 2021.

PARTICIPANTS:

Inclusion criteria

1. Patients who have given their consent to participate in the study.

2. Age- 20 to 50 years with ACL injury.

3. Patients with ACL injuries of grade 2 and grade 3

Exclusion criteria

1. Patient with established osteoarthritis.

2. Age below 20 years and above 50 years.

4. History of coagulation diseases.

5. Patient with neurological deficit.

6. No previous surgery on the affected knee

ALLOCATION & IMPLEMENTATION: After obtaining consent for surgery, every patient has to do a preoperative surgical profile.

INTERVENTIONS: The ACL was arthroscopically reconstructed in all our cases. The patient was treated postoperatively with IV antibiotics, analgesics, antacids and multivitamins. Proper wound care along with physiotherapy and rehabilitation was done. •Suture removal is done on the 11th post-op day • follow up done post-operatively at 3 months and 6 months & 1 year, respectively with an evaluation of the outcome clinically and radiologically.

OBJECTIVES: To study the population characteristics in our tertiary care centre in South India.

OUTCOMES: The age and gender distribution, mode of injury, ACL injury grading, side affected, patient's occupation and symptoms at presentation were noted.

OBSERVATIONS AND RESULTS

AGE DISTRIBUTION:

In our study, the average age was 26 years. The youngest patient was 23 years old, while the oldest was 45. The age group 31-40 years had the highest number of patients (48%) after that the age group 21-30 years (30 %). The mean age was 25.18 ± 5.64 years.

Table 1: Age Distribution

Age	No of Patients	Percentage
21-30 years	15	30
31-40 years	24	48
>40 years	11	22

Figure 1: Age Distribution
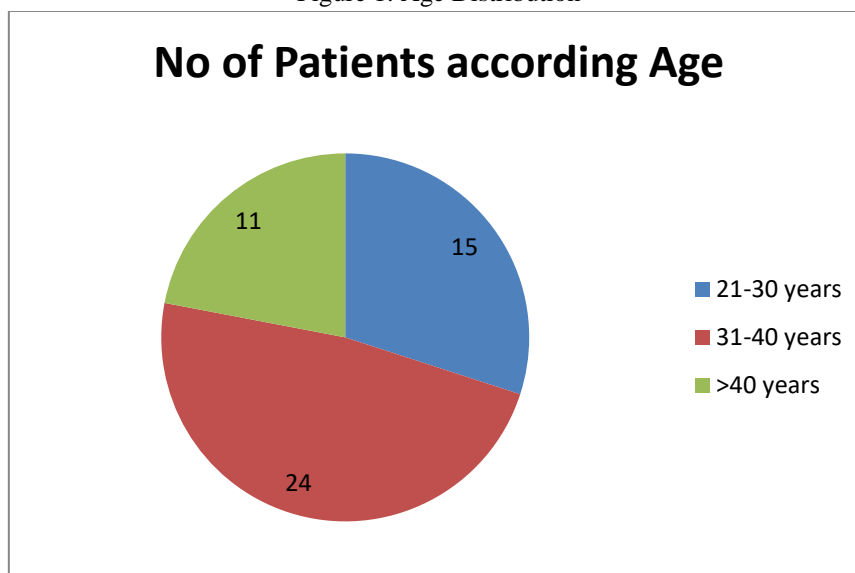
SEX DISTRIBUTION:

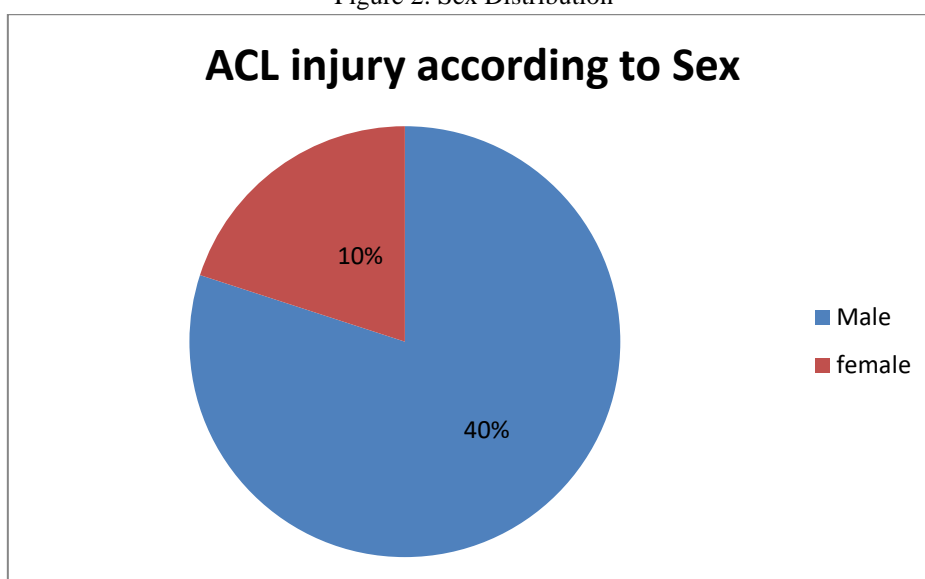In our group of 50 patients, 40 (80%) were men and 10 (20%) were women (male predominance). It might be due to the male involvement in outdoor activities such as sports and traffic accidents.

Table 2: Sex Distribution

Sex	Patients	Percentage
Male	**40**	**80**
female	**10**	**20**
total	**50**	**100**

Figure 2: Sex Distribution
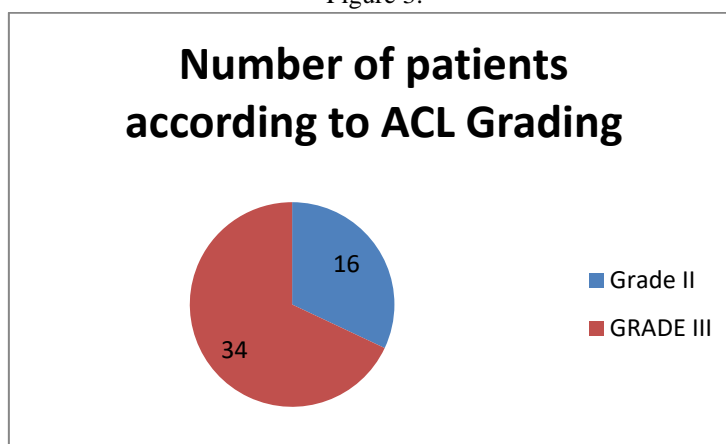

GRADING OF ACL INJURY

In our series of 50 patients, ACL tear with a maximum of 34 patients in GRADE lll (68%) and 16 patients in GRADE ll(32%)

Table 3: ACL Grading

| Grading of ACL injury	Number of patients	Percentage
Grade II	16	32
GRADE III	34	68
Total	50	100

Figure 3:

SIDE INVOLVED:

In our study of 50 patients with ACL tear, the maximum no of patients with the affected side being the right was 30 (60%) and 20 patients affected on the left (40%)

Table 4: Side involvement

Side involved	Number of patients	Percentage
Right	30	60
Left	20	40
Total	50	100

Figure 4:

Number of patients according to Side involved
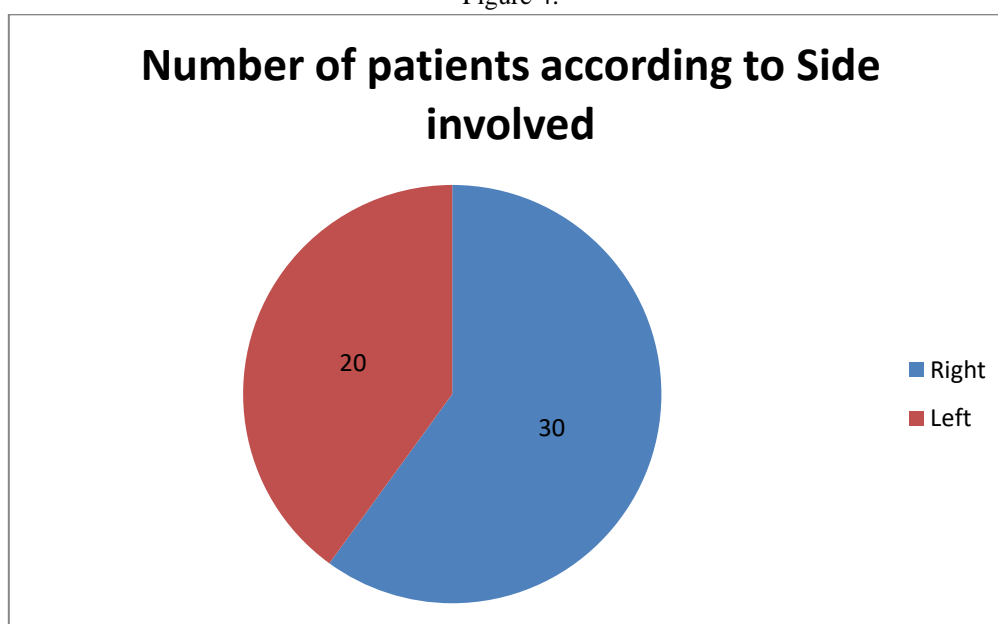
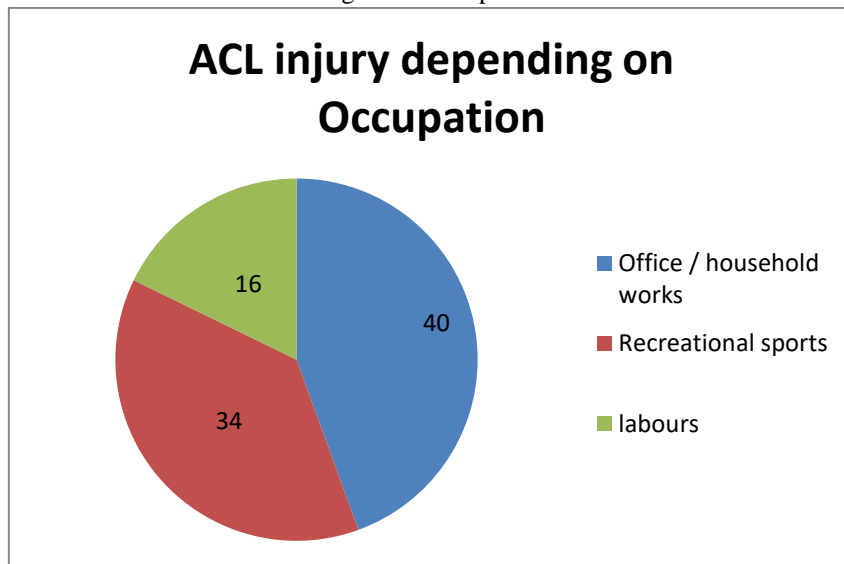DISTRIBUTION OF CASES BASED ON PATIENT PROFILE

In our study of 50 patients, 40% of patients were involved in light office/household work, 33% were recreational sports persons and 27 % were labour workers.

Table 5: Occupation

| Occupation	No of patients	Percentage
Office/household works	20	40
Recreational sports	17	34
labours	13	16

Figure 5: Occupation

MODE OF INJURY:

In our study of 50 patients, the mode of injuring the ACL is almost equal. 26 patients with RTA (52%) and 24 patients got injured by reactional/ sports activity (48%)

Table 6: Mode of Injury

| Mode of injury	Number of patients	Percentage
RTA	26	52
sports	24	48
Total	50	100

Figure 6: Mode of Injury
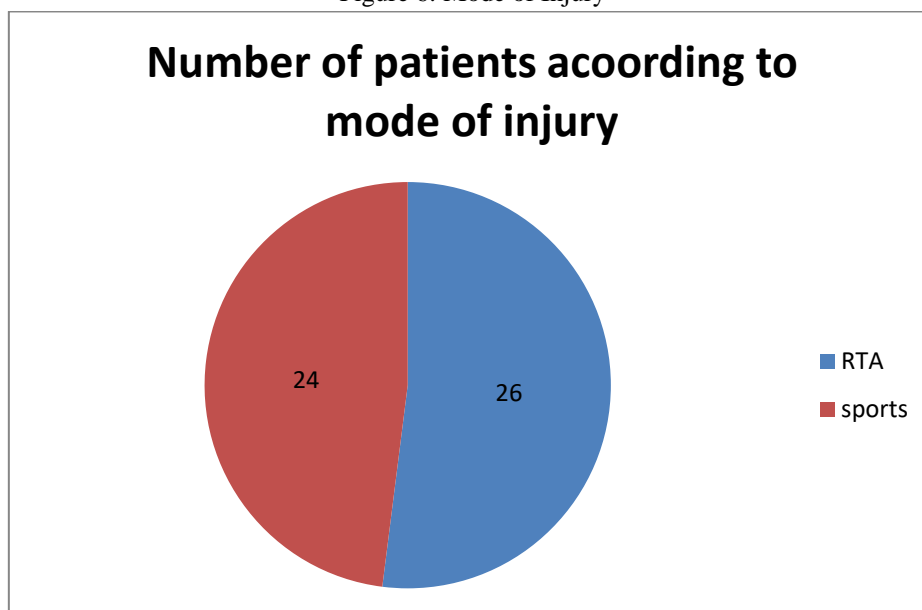
SYMPTOMS AT PRESENTATION:

All of the patients complained of their knees giving way sensation. The clicking of the knee was appreciated by 60% of the patients. The swelling was evident in 36% of the patients, and discomfort was present in 80% of the cases. A history of knee locking was reported by 60% of the participants, which was associated with knee injury.

Table 7: Symptoms at presentation

Symptoms at presentation	Number of patients	Percentage
Giving way	50	100
Pain	40	80
Swelling	18	36
Locking	30	60
Clicking	30	60

Figure 7: Symptoms at presentation
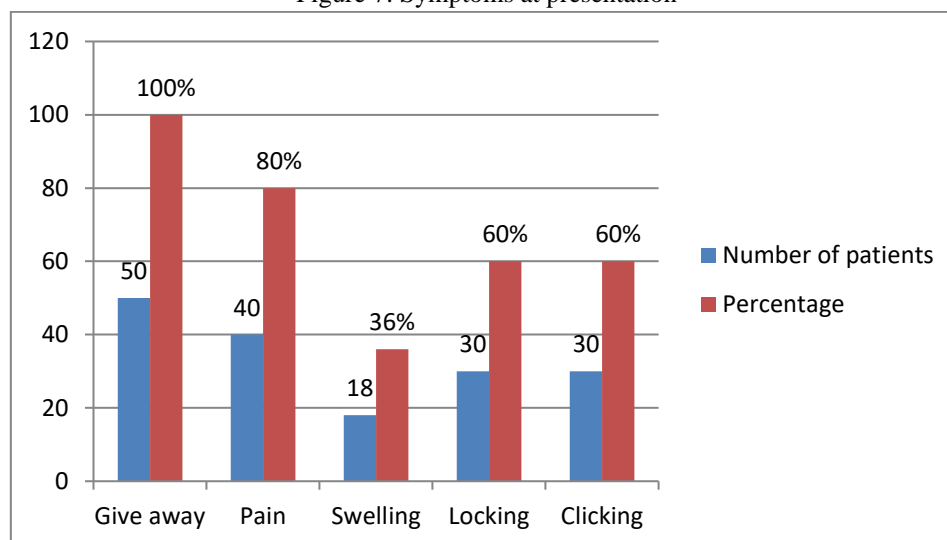
Discussion

The average age in our research was 26 years. The youngest patient was 23 years old, while the oldest was 45. The age group 31-40 years had the highest number of patients (48%) followed by the age group 21-30 years (30%). Alkarni et al state that the patient age ranged between 15 and 40 years with a mean age of 27.9.

In our group of 50 patients, 40 (80%) were men and 10 (20%) were women (Male Predominance). It could be because more men are participating in outside activities like sports and car crashes. In their study, Brown et al [6] looked at the frequency of sex and limb differences in anterior cruciate ligament damage. They discovered that although women are less likely to sustain an injury than men, men are more likely to do so because of their increased exposure to stressful situations. They also concluded that disparities in limbs had no bearing on injuries or healing. According to Sutton et al [7], women are more likely to get an ACL injury due to a variety of causes. It has been reported that the female-to-male ratio among athletes is 4:5.

According to certain research, among the variables that increase the risk for women include a weaker hamstring (more quadriceps dominating) and a preference for the recruitment of the quadriceps muscle group during deceleration. Since the quadriceps muscles are not as effective as the hamstring muscles at preventing anterior tibial translation, engaging them during slow motion puts excessively high loads on the ACL. In addition, women's core stability is poorer than men's.

We observed that 34 patients (68%) and 16 patients (32%), respectively, were in GRADE 3 and GRADE 2 of our research of 50 patients with ACL rupture. The majority of individuals with impacted sides in research

including 50 patients with ACL tears were 30 (60%) on the right side and 20 (40%) on the left. According to Sutton et al. [7], female athletes experience ACL ruptures more frequently in the supporting leg than in the kicking leg, and at a younger age. According to Alqarni et al. [8], the right side was most frequently affected when an ACL injury occurred.

Office and residential workers make up 40% of our patients, with recreational athletes (33%) and labourers (27%), following closely behind. According to Alqarni et al.'s [8] research on ACL injuries, full-time workers are the group most frequently impacted, followed by students.

In our 50-person study, the mechanism of ACL injury was almost identical. Reactional/sports activity caused injury to 24 individuals (48%), while it did not cause harm to 26 patients (52%). The non-contact method of injury was the most often observed and accounted for 64.4% of the injuries (n = 233), according to John et al. [9]. The remaining 35.6% of injuries were contact-related, with direct touch accounting for 24% of those cases. According to Alqarni et al.'s study [8], the majority of cases were injuries that were brought on by sports-related activities.

Every patient in our study reported that their knees were giving way. 60% of the patients expressed appreciation for the knee's clicking. In 36% of the patients, swelling was visible, and in 80% of the instances, discomfort was reported. 60% of the participants had a history of knee locking, which was linked to knee injuries. According to Evans et al. [10], the majority of patients would complain of deep knee pain accompanied by a quick click or snap, and roughly 70% would have acute swelling as a result of haemarthrosis.

CONCLUSION:

Rates of anterior cruciate ligament injuries differ depending on the sport, sex, and exposure type. When assessing the success of evidence-based, focused preventative initiatives, it is critical to take these distinctions into account. It is critical to prevent knee injuries and to develop regulations that would protect both professional and amateur athletes from sports-related injuries, more focused epidemiological research is required.

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