

## Demographic Status of Patients with ACL Injury in Tertiary Hospital Bangladesh

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### ABSTRACT

**Background:** One of the strong bands of tissue that help connect your thigh bone (femur) to your shinbone (tibia) can be torn or sprained, and this is known as an anterior cruciate ligament (ACL) injury (tibia).

**Objective:** To assess the demographic status of patients with ACL injury in tertiary hospital Bangladesh.

**Methods:** This prospective observational study was carried out at National Institute of Traumatology and Orthopaedic Rehabilitation, Dhaka from January 2019 to December 2020. A total case of 30 in group 1 (Hamstring tendon) and 30 in group 2 (Peroneus longus tendon) is included in the study according to inclusion and exclusion criteria.

**Results:** Mean age was  $25.45 \pm 0.93$  years with male pre-dominance (96.67%). In both groups male patients were mostly common, group-1, 93.33% and group-2, 100%. Right knees were affected more (58%) in comparison to left knees (42%). The cause of injury which was mostly sports-related injuries (78.33%) and the injury was more common among students (43.33%).

**Conclusion:** From our study we can say that, young age people and male patients were mostly affected. In addition to that, right knee was mostly injured and sports-related injuries were common among students.

**KEYWORDS:** Anterior cruciate ligament (ACL), knee injury, ligament

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### INTRODUCTION

Ligamentous injury in the athlete is a major cause of morbidity and time away from sport. Ligamentous repair remains an ongoing aspiration in the treatment of athletic patients in order to try and facilitate a rapid and complete return to high level sporting activity (1).<sup>1</sup>

Anterior cruciate ligament injuries account for anywhere between 25 and 50% of ligamentous knee injuries (It pose unique clinic problems because of its poor capacity to undergo biological healing due to the local intra-articular conditions. A potential theory to explain this is that the synovial fluid and intra-articular movement prevents

formation of a stable fibrin-platelet scaffold. Without this scaffold, no primary healing can take place (Murray et al., 2000).<sup>2</sup>

ACL injuries were apparently first described by the Ancient Greeks. The first primary ACL repair was reported in 1895 by Mayo Robson. He describes reattaching both cruciate ligaments from their femoral attachment sites using catgut ligatures. Primary ACL repair was refined further and eventually open primary ACL repair became the gold standard for ACL treatment in the 1970s and 1980s. (van der List & DiFelice 2017; Mahapatra et al., 2018)<sup>3,1</sup>

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'Primary repair' is any surgical procedure that involves restoring the original native injured ligament. If the procedure involves introducing a graft to replace the original injured ligament, we will refer to this as a reconstruction. It is important for the reader to be clear of the differences as 'repair' is often used incorrectly within the literature to describe reconstruction techniques.

In this study our main objective is to evaluate the demographic status of patients with ACL injury in tertiary hospital Bangladesh.

### OBJECTIVE

To assess the demographic status of patients with ACL injury in tertiary hospital Bangladesh.

### METHODOLOGY

This is a prospective observational study was carried out in the National institute of Traumatology & Orthopedic Rehabilitation (NITOR), Dhaka from January 2019 to December 2020. 60 Patients admitted with ACL injury in the NITOR, Dhaka during study period. The diagnosis of ACL rupture was established based on history, physical examination and Magnetic Resonance Imaging of the injured knee. Where 30 patients are divided into Group-1 ACL reconstruction with Hamstring (semitendinosus-gracilis) tendon. Whereas other 30 patients divided in to group – 2: ACL reconstruction with Peroneus Longus tendon.

#### Inclusion criteria

- Age between 18 to 50 years
- Clinically & radiologically diagnosed ACL injuries.

#### Exclusion criteria

- Age less than 18 years and more than 50 years.
- Presence of fracture of bones around the knee and ankle.
- Multiple ligament injuries of the knee.
- Associated meniscus injury.

- Patients with pre-existing flat foot, ankle deformity, paralytic conditions, poliomyelitis or previous significant injuries to ankle.
- Loss of knee motion due to acute injury/stiffness.
- Clinical and radiological evidence of osteoarthritis of the affected knee.

### Data collection procedure

Cases were selected for study from OPD. All the patients were thoroughly evaluated both clinically and radiologically and the Lysholm Score was calculated. The patients were then admitted after counseling for surgery and pre-operative data were collected. Then the patients were investigated for anaesthetic check-up and prepared for the operation. An informed written consent was taken for operation after proper pre-operative check-up. After discussing the technique with the surgical team, operation was performed methodically, per-operative and post-operative data recorded. Each patient followed up for 24 weeks, functional scoring was done and recorded for evaluation of final outcome.

### Data processing and analysis

All the data were edited for calculation and assessment. The data were tabulated and quantitative parameters of patient were summarized in terms of mean with standard deviation, to understand the variations present in the data. Percentage expression for positivity of scoring estimated along with 95% confidence interval. The significance of the results as determined in 95.0% confidence interval and a value of  $p < 0.05$  considered to be statistically significant. For calculations stata, version 16 software was used.

### Results

Table-1 shows age distribution where the mean age of the respondents was  $25.45 \pm 0.93$  years. The age of most of the patients lied between 18 and 25 years (58.33%) and age of a small number of patients were in group above 36 years (11.67%). Statistically no difference is noted between these two groups.

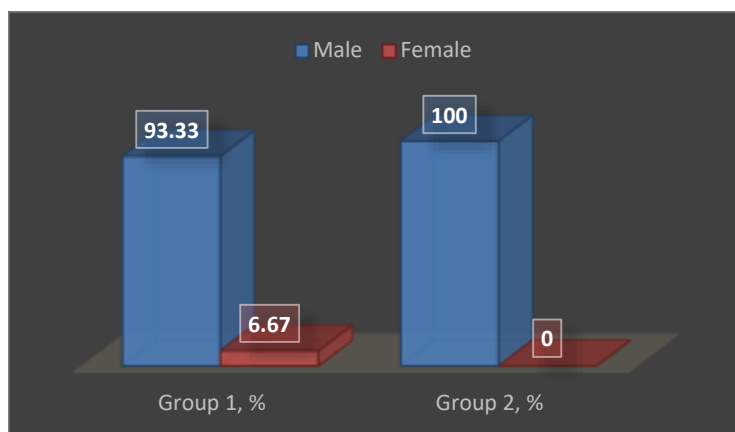
**Table 1. Age distribution of the patients (N = 60)**

Age in years	Group 1	Group 2	Total	p-value
	n <sub>1</sub> (%)	n <sub>2</sub> (%)	N (%)	
18-25 years	19 (63.33)	16 (53.33)	35 (58.33)	0.647 <sup>a</sup>
26-35 years	7(23.33)	11(36.67)	18 (30.00)	
Above 36 years	4 (13.33)	3 (10.00)	7 (11.67)	
Mean±SD	24.8±1.41	26.1±1.22	25.45±0.93	0.492 <sup>b</sup>
<b>Total</b>	<b>30 (100.0)</b>	<b>30 (100.0)</b>	<b>60 (100.0)</b>	

<sup>a</sup>Fisher's Exact Test; <sup>b</sup>unpaired t-test

Figure-1 shows gender distribution where majority of the respondents were males (96.67%). The male-female ratio was 58:2. The difference in male and female between two groups was not statistically significant ( $p=.492$ )

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**Figure 1. Gender of the patients (N = 60)**

Table-2 shows occupational status where the student (43.33%) was the commonest, followed by service holders (33.33%) and rest of them either businessmen or housewife or salesman or driver were the least (23.33%). The

distribution of occupation of both groups was more or less similar. And there are no significant different between the treatment groups.

**Table 2. Occupation of the patients (N = 60)**

Occupation of the patients	Group 1	Group 2	Total	p-value
	n <sub>1</sub> (%)	n <sub>2</sub> (%)	N (%)	
Students	14 (46.67)	12 (40.00)	26 (43.33)	0.944 <sup>a</sup>
Service holders	9 (30.00)	11 (36.67)	20 (33.33)	
Others	7 (23.33)	7 (23.33)	14 (23.33)	
<b>Total</b>	<b>30 (100.0)</b>	<b>30 (100.0)</b>	<b>60 (100.0)</b>	

<sup>a</sup>Fisher's Exact Test

As shown in table-3, the right sided knee injury was more common (58.33%) than the left knee. In group 1, right knee

injury was two times higher than left side; whereas in group 2, both knee injuries were equal.

**Table 3. Affected knees of the patients (N = 60)**

Affected knee	Group 1	Group 2	Total	p-value
	n <sub>1</sub> (%)	n <sub>2</sub> (%)	N (%)	
Right	20 (66.67)	15 (50.00)	35 (58.33)	0.190 <sup>a</sup>
Left	10 (33.33)	15 (50.00)	25 (41.7)	
<b>Total</b>	<b>30 (100.0)</b>	<b>30 (100.0)</b>	<b>60 (100.0)</b>	

<sup>a</sup>Chi square test

Table-4 illustrates the cause of injury which was mostly sports related (78.33%) followed by road traffic accident

(11.67%). Where a minimal reported event was from other event i.e., fall from height, pedestrian injury (10.00%).

**Table 4. Distribution of causes of injury of the patients (N = 60)**

Causes of the injury	Group 1	Group 2	Total	p-value
	n <sub>1</sub> (%)	n <sub>2</sub> (%)	N (%)	
Sports	23 (76.67)	24 (80.00)	47 (78.33)	1.00 <sup>a</sup>
Road Traffic Accident (RTA)	4 (13.33)	3 (10.00)	7 (11.67)	
Others	3 (10.00)	3 (10.00)	6 (10.00)	
<b>Total</b>	<b>30 (100.0)</b>	<b>30 (100.0)</b>	<b>60 (100.0)</b>	

<sup>a</sup>Fisher's Exact Test

Table-5 shows that mean time interval between injury and operation was more or less equal in both groups. Where in

Group-1 the mean interval was 10.23±8.36 months & Group-2 it was 10.90±6.89 months. The difference in time interval

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between two groups was not statistically significant ( $p=0.737$ ).

**Table 5. Time interval between injury and operation (N = 60)**

Group	Number	Mean (Month)	SD	p-value
Group 1	30	10.23	8.36	0.737 <sup>a</sup>
Group 2	30	10.90	6.89	
<b>Total</b>	<b>60</b>	<b>11.08</b>	<b>9.06</b>	

<sup>a</sup>Unpaired t test

### DISCUSSION

ACL injury is one of the common injury of knee. The increasing number of participants in sport has resulted in an increase incidence of ACL injury. There are several autograft choices for ACL reconstruction, but each autograft has some advantages and disadvantages, especially in complication. Three autograft options that are commonly used are bone patellar tendon bone (BPTB), hamstring and bone quadriceps tendon (BQT) grafts. Using peroneus longus autograft (PLT) is a recent development in the field of ACL reconstruction. The outcome of peroneus longus tendon in ACL reconstruction is needed to be compared with a standard procedure like hamstring to ensure its rational use.

This study Include total 60 patients who underwent ACL reconstruction surgery, with 30 patients from hamstring group (Group-1) and 30 patients from peroneus longus group(group-2). The follow up time was minimum 6 months. The mean age of the respondents was  $25.45\pm 0.93$  years with a male predominance (96.67%). Most of the sample affected by ACL injury were students (43.33%) followed by service holders (33.33%). Among these variables no statistical significance was reported between two groups. This signifies that mostly young active male individual who are engaged in sports and outside activity are affected more by this injury. The result of our study is comparable to other studies (Khajotia et al., 2018; Chowdhury et al., 2019; Rhatomy et al., 2019).<sup>4-6</sup>

Patients under the age of 30 years had a significantly greater return to sports activity after surgery signifying the importance of doing this surgery at an early age (Almeida et al., 2014). A study conducted in Bangladesh found in terms of occupation 42.8%, 30.2%, 19.0%, 4.8% and 3.2% were student, service holder, businessmen, house wife and armed forces personnel respectively (Muktadir et al., 2014).<sup>7</sup>

The most common injured side were right (58.33%). Although prevalence of right sided injuries are more in most studies, a study conducted by Sgaglione and his colleagues reported different result. In his study, injured site is mostly on left side (Sgaglione et al., 1990). However, there was no significant difference in between two groups in the present study.<sup>8</sup>

In this study, cause of injury was mostly sporting related injuries (78.33%) followed by road traffic accident (11.67%). Where a minimal reported event was from other event i.e fall from height, pedestrian injury (10.00%). Bhat and his

colleagues also found sports injury the most common cause of ACL tear (Bhat et al., 2013).<sup>10</sup>

Although mean time interval between injury and operation was less in Group-1 ( $10.23\pm 8.36$  months) in comparison to Group-2 ( $10.90\pm 6.89$  months), the difference was not statistically significant ( $p=0.901$ ). The mean interval between injury and operation was 4.3 months in a study conducted by Suranigi and his colleagues (10) The mean interval between injury and operation was 11.08 months in this study and this delay was due to late coming of the patients:

### CONCLUSION

From our study we can say that, young age people and male patients were mostly affected. In addition to that, right knee was mostly injured and sports-related injuries were common among students.

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