

Comparison of Lower Limb Abnormalities on Anterior Cruciate Ligament Injuries in Athletes and Healthy People in Ilam Province

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ABSTRACT

Damage to the anterior cruciate ligament (ACL), with 250,000 procedures yearly event rate in America, the most common knee ligament injury, ACL injuries in young athletes 15 to 25 years old, is most common. researchers have reported annual operating 175,000 ACL, done in America, which has cost more than \$ 2 billion. Ligament reconstruction, is the most common way to treat. The purpose of this study was to investigate the effect of lower limb abnormalities on anterior cruciate ligament injuries in athletes and healthy people in Ilam province. To this end, 60 people were injured, including two groups Minsk, and is healthy., Which all persons participating wrestlers, the club the province and city are Ilam (mean age 88 without injury / 28 years, standard deviation 3/38 height 177/85 cm, and the standard deviation 7/62, and weighs 76/9 kg, SD 6/70). And (affected people, average age 26/65 years, SD 5/38, height 175/6 cm, and a standard deviation of 69 quarters, and weighs 77/3 kg, SD 9/39). In this study, the rate of rotation of the tibia and anti versions and degrees of varus was measured. The results showed that the rotation of the tibia, the anterior cruciate ligament has an effect, and the rotation of the tibia was also identified as a risk factor for knee was aligned. Findings from this study showed that increasing the angle of the anti version, is one of the causes of anterior cruciate ligament injury. Others, the increased rotation of the tibia, only the anterior cruciate ligament, affects P (<.05). Hence, identification of risk factors, bio- mechanical and exclusive screening athletes with increased anti- version angle, and increased tibial rotation, and increasing degrees of virus, which may make them more susceptible to anterior cruciate ligament is essential and provide prevention programs for the teachers they need to be.

KEYWORDS:Limb Abnormalities, Ligament Injuries, Athletes and Healthy People

INTRODUCTION

Damage to the anterior cruciate ligament (ACL), with 250,000 procedures yearly event rate in America, the most common knee ligament injury [1]. Damaged ACL, the young athletes 15 to 25 years, more frequently [2]. Researchers have reported annual operating 175,000 ACL, done that in America, at a cost of over \$ 2 billion, has been associated with. Ligament reconstruction, it is the most common treatment method [3]. Complete tear of the ligament may be other abnormal conditions, such as instability of the knee injury and osteoarthritis internal Minsk, to be followed [4]. Researchers have reported a 70 percent damaged ACL, works with non- treated [5]. Women athletes in the sport together with deceleration, landing and turning frequently, for 2 to 8 times more than men, are suffering from the ligament injury [6]. Anterior cruciate ligament injury, is a multi-agent nature, and many internal and external factors, have contributed to the injury, but in particular, the structural differences of the lower limbs, movement patterns, mechanisms, especially the dominant leg quadriceps activation, when the displacement of the tibia, landing and levels of production, the specific factors that are associated with female ACL injury. For example, women in martial arts, rugby, football, American football, basketball, gymnastics and volleyball, are more susceptible to injury [7]. More research has been done on the relationship between the lower limbs, and damaged ACL, one or more anatomical changes take place independently of the investigation, and research gaps, keeping in touch with a few changes, with also examined are still there. Navicular drop, knee Q angle, excessive pronation, ankle and leg rotation, knee extension and hyper factors examined in the study. According to studies, the extent of damage on the lower extremities, more damage on the upper extremity. In the meantime, knee injuries in the lower extremities are most receivers. So, 35/4 % of damage to the body, the most common is followed by the

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knee injury [8]. On the other hand, since the joint, subjected to repeated stress and strain, it is expected that the joint is a joint that suffer most during different exercises, to account for [9]. Stability of the knee joint by ligaments, tendons and muscles around it will provide, of which between the meniscus and cruciate ligaments play an important role in the stability of the knee joint are responsible. Therefore, any defect or weakness in the knee stabilizer elements, understand the consequences of poor motor control, and balance makes (Khodadad 2007). The most common knee ligament injuries, anterior cruciate ligament -related injury, which leads to loosening and instability of the knee kick, and almost 50 % of all knee injuries, timbre, and the remarkable thing is that 60 percent of Risk factors for infection, damage to the anterior cruciate ligament, is associated with skeletal problems [10]. According to the U.S. Department of Orthopedic injuries, meniscus, the knee is the second most common injury, often at 22-86 %, with associated anterior cruciate ligament injury. Nowadays, many researches about Impact of the irregularities review, including abnormalities of the knee joint, and rotation of the lower limb, the potential and incidence of injury has been done in this area, and a large part of these studies found a common sports injury prevention, detection factors and possible risk factors, the risk of knee injury. Age, gender, body type, flexibility, joint laxity, muscle strength, past injuries, rehabilitation programs, and anatomical abnormalities, including risk factors for infection due to damage in the lower limbs is. In the meantime, anatomical abnormalities, injury is the most important factor [11]. As noted above, anatomic abnormalities, and various deformities of the knee joint, and the direction of rotation of the lower limb, as valgus, varus, hyperextension of the knee, Annette version and tibial torsion seen. Valgus is a term that refers to the outside. In normal mode, tibia compared with femoral valgus angle is small (about 7 degrees). So standing tibial bone, the femur is almost along, that in this situation, while still attached to the ankle; there is no distance between your knees. But the effect of varus, when bonded together, ankles, knees apart (ShayestehAar, 2005). The biomechanics perspective, during descent, the degrees of varus and valgus more people, and also those external and internal rotations, lubrication of joints, they are more likely to have frequent injury [12].

. The results of this study will show, along with lower limb abnormalities such as tibial torsion (twisted tibia, around the longitudinal axis) and anti- femoral version (rotation or twisting of the normal, natural and femur), and the effects of varus as risk factors for injury, what effect will the ACL, and whether lower limb abnormalities, definitely has an effect on ACL injury or not, and the results of this study, the use of athletic trainers, and physical therapists and physicians catch.

MATERIALS AND METHODS

This study is a descriptive research, causal comparative, and after the event. The population study, involving 60 people, including two groups of people injured ACL, and groups of people. All participants, wrestling clubs in the county, and Ilam city are at least four years of experience in sports at various levels (including national championships, club and provincial levels), were having. Subjects in each group had 20 patients. With reference to sports clubs, individuals injured ACL, through questionnaires and healthy subjects were randomly selected. Be noted that, in healthy individuals without any history of injury, not the knee. Subjects in the two groups after the election of twenty people, including vulnerable individuals ACL, and no damage was done. After obtaining consent, and willingness to participate in the study, the participants, via a questionnaire, a demographic profile of the subjects were taken. Then the 16 -slice computed tomography machine, considered abnormalities, were evaluated. Finally, abnormalities angles obtained for each individual and each group was calculated and then the healthy subjects, were compared. So from turn consent, and give explanation of how to do research, and the radiologist 's description about the risks of x-rays, and personal information through a questionnaire survey was operational phase. Inventory, a self-made, and includes information collection, including height, weight, age, experience, type of injury, time after injury, time away from work due to injury, leg injury, whether internal or external rupture of the ACL, time after surgery, and non- dominant leg was better.

CT scan tool, how to calculate and use

Appropriate tools to assess and calculate the rotation angles of the lower limb is a CT scan [13]. Therefore, in the current study, the tool CT 16 -slice profile, a product of German company Siemens has been used. Be noted that, for the calculation of Anti version angles, tibial rotation and 1 slice CT scan also suffice.

Is calculated rotation angles, the radiologist assessed can be calculated in several ways. Below, more efficient ways, and sometimes in several studies, including this study, has been used, is given.

Anti version calculated:

Anti version calculate, in a way, the desired Kats the pelvic area, and the distal femur was taken. In each area, the radiologist detect the best cut- selected, and passing an imaginary transverse line in the same area, we would like to draw the tangent line. Then the tangent lines on both the line continues to intersect said. The angle of the tangent lines have been cut, as seen Anti version angle (Figure 1).

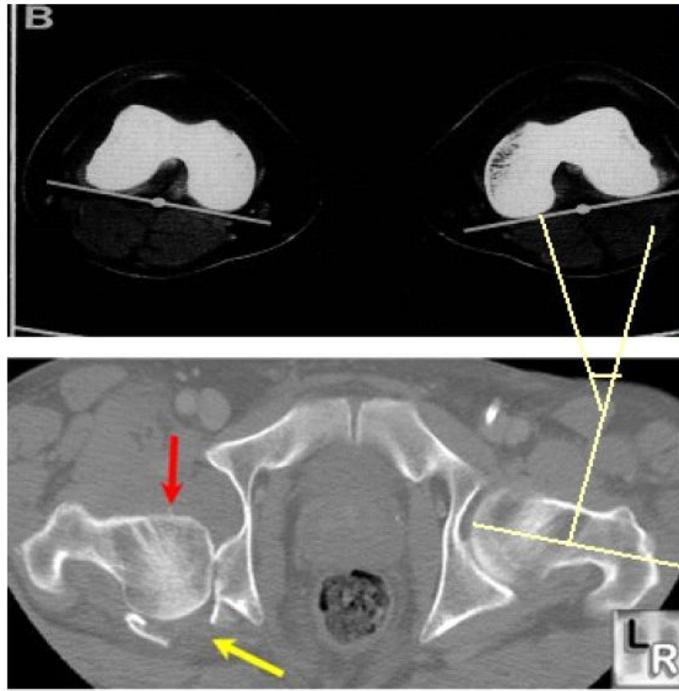


Figure 1 - draw Annette angle version

In another method, which is relatively easier than the first method, the best Kats selected in each area, on the run, and cut the desired rotation angle between the two calculated, and the rotation angle Anti version, or rotate Tibial consider. This method of calculation, using a special software, is performed. Calculate the angle of rotation Anti version, the angle created between the imaginary transverse line crossing, the best cut-selected, and the line parallel to the horizontal, as measured (Figure 2).

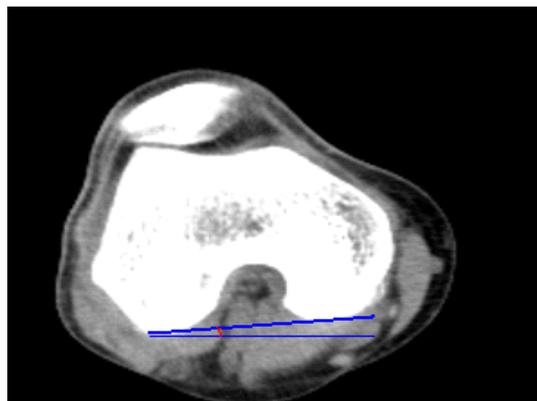


Figure 2- Distal to the knee joint

Calculate the angle of rotation of the tibia

To calculate the angle of rotation of the tibia, like Anti version angle, the best cut of the proximal tibial, and the best cut possible, the distal chosen, then drawing tangents, and angles obtained from tangent lines to each other, is calculated as the tribalism rotation angle (Figure 3).

Varus angle is calculated as:

In the research, given the nature of the data, and also calculate the cost varus angle, relatively accurate, and the images obtained from the CT scan is used to check that the resulting images, calculates the varus angle, is easily measurable.

To calculate the varus angle of the two methods can be used. The angle between two lines drawn from the lateral projection of the tibial bone, and the distal femur. And other methods, the approach lane of the mechanical axis, and the angle formed, which is considered as valgus angle (Figures 3 and 4).

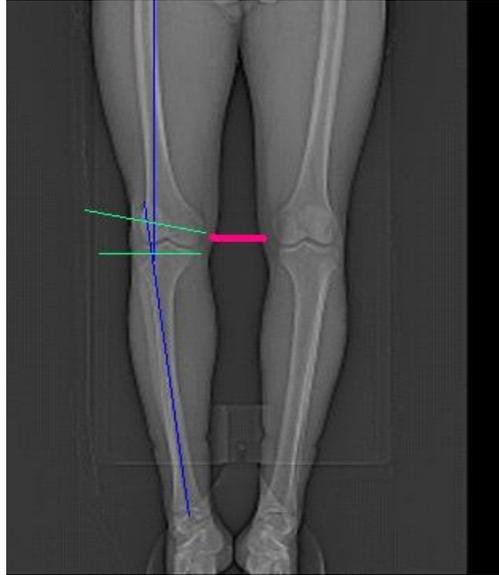


Figure 3-Varus angle calculation



Figure 4 -Tibial rotation angle calculation

Statistical methods for data analysis

For classifying and arranging the data, descriptive statistics and analysis of raw data, inferential statistics were used. Also, post hoc Kolmogorov Smirnov test to show normal distribution of data was used. To evaluate the difference between the normal group, and another group (group meniscus damage), independent t- test was used. For data analysis, spss software version 18 and Excel software is used to draw graphs.

RESULTS

In this section, Specifications and Features 3 groups participating subjects, with meniscus tear, anterior cruciate ligament, and normal subjects are presented.

Table (1), mean, standard deviation, and the Profile of respondents, are presented.

Table (1) profile of respondents

weight(kg)		height (cm)		Age(years)		ProfileGroup
Standard deviation	Average	Standard deviation	Average	Standard deviation	Average	
6/70	76/9	7/62	177/85	3/38	28/88	Those without injury
6/66	77/55	5/35	175/85	3/42	26/57	TheydamagedACL
7/57	77/25	6/02	176/43	4/23	27/37	total

Hypothesis

Null hypothesis1: the amount oftibialrotation, anterior cruciate ligamentinjury patients, and normalsubjects were significantly different.

Table(2), the meanand standard deviation, tibialrotationto normal people, and people withdamaged anterior cruciate ligament, and no significantrelationship between the twogroups is shown.

Table(2) independent t-test results, andtibialrotation rate between the two groupsof subjects with anteriorcruciate ligament damage, and healthy

Sign	t	Damagedcruciate ligament		Healthy		Group Variable
		Standard deviation	Average	Standard deviation	Average	
/063	1/91	3/58	21/85	4/88	19/25	Tibialrotation(degrees)

The results of tibia rotation, and independent t-test was observed that:

The difference intibialrotation, anterior cruciate ligamentbetween damagedand healthy subjects, the choice of $0/05 > P$ not significant, so the null hypothesis is rejected.

Figure(2), the mean and standard deviation, tibialrotation in healthy and damaged

Null hypothesis2: Anti version rates between subjects with anterior cruciate ligament injury, and normal subjects were significantly different.

Table(3), the mean and standard deviation Anti version healthy people and people with damaged anterior cruciate ligament, and the correlation between the two groups is shown.

Sign	t	A damaged anterior cruciate ligament		Healthy		Group Variable
		Standard deviation	Average	Standard deviation	Average	
/001	4/15	3/16	16/85	1/73	13/5	Antiversion (O)

The results Anti version, and independent t-test, it was observed that:

Anti version difference between the two groups damaged the anterior cruciate ligament, and healthy choice at $0/05 > P$, was significant, and the null hypothesis was confirmed.

Figure (3) Anti version mean and standard deviation in normal and damaged Null hypothesis 6 degrees varus knee between rate of anterior cruciate ligament injury patients, and normal subjects were significantly different.

Table (4), the mean and standard deviation, degrees of varus healthy people and people with damaged anterior cruciate ligament, and no significant relationship between the two groups is shown.

Table (4) the results of independent t-tests, and degrees of varus between the two groups of healthy subjects and subjects with anterior cruciate ligament injury.

Sign	t	A damaged anterior cruciate ligament		Healthy		Group Variable
		Standard deviation	Average	Standard deviation	Average	
/52	/65	2/65	7/75	3/59	7/10	Varus knees(degrees)

According to the results of varus angles, and independent t- test was observed that: difference in varus knee, the anterior cruciate ligament between damaged and healthy choice of 0/05> P, not significant, and therefore the null hypothesis is rejected.

Figure (4), the mean and standard deviation, varus angles in healthy and damaged

DISCUSSION AND CONCLUSIONS

Exercise not only as a public health tool, but also as a means to achieve victory, and causing a major economic industry in recent years, almost everyone is looking at different communities, has attracted interest. Hence, given the increasing level of sporting competitions, and high stress levels and tensions, the people involved, higher levels of sports injuries, as it seems likely. One of the most threatening injuries in wrestling, injuries to the lower extremities, particularly the knee, and specific injuries, meniscus and anterior cruciate ligament is. Although several studies on the evaluation of abnormalities in other sports, have been conducted in the target communities, but about the impact of these anomalies, the most common injury around. Regarding the effect of tibial rotation on anterior cruciate ligament injury, the previous studies mentioned, including: Anne Dong partners wheat line, but research is limited and few.

But the results of these studies, in conjunction with the effects of tibial rotation on anterior cruciate ligament injury were counter. Among the reasons for discrepancies in the results obtained in the study could be the difference in the number of subjects, sex and type of sport participants, they noted. It is also noted that the average tibial torsion, previous studies about 30 degrees, it was reported, which is higher than the average rate achieved in our study (about 22 degrees), respectively. The results of monthly surveys Dong, Song, Murphy, and Williams Esaki, Silver, Hicks, Sebr, Muller, Lombardo and colleagues stated that the internal rotation of the femoral head (Anti version), and skeletal abnormalities, the anterior cruciate ligament injuries transition effects. Sebr research, Anti version turns out, about 16 degrees has been reported, the results of our study, about 16 degrees, affected individuals is consistent. However, reasons mentioned earlier, the results were inconsistent wheat. Schmitz and Associates, which express increasing degrees of varus and valgus, lubrication and increased joint laxity, as well as the possibility of sustaining ligament damage and knee support, internal and external rotation of the knee in people more aware of other people. Guoan Li, increase the angle Q, increases in the rate of destruction of the anterior cruciate ligament will. Lina Sharma, the effect of varus angle increases, the instability point. Randy and many other researchers, the effect of increasing the angle Q, the knee instabilities, are discussed further increased varus angle.

The results of this study indicate that, although the mean varus angle, the person affected is slightly higher, but this difference was not significant, and the reasons for this inconsistency could be the subjects' activity level, gender, type of injury, the number of and of course, mean stress, and other factors can be searched.

The findings of this study raise the Anti version angles, one cause of injury to the anterior cruciate ligament shows. Furthermore, increased tibia rotation, anterior cruciate ligament injuries only, the significance level ($P < .05$) was ineffective. Finally, varus angle increases, the level of significance, the cruciate ligament injury was not significant. Hence, we Anti version angle increases, the probability of factors risk common injuries of the knee, may be considered. Also, based on these results, the tibial rotation could such predisposing the anterior cruciate ligament is damaged. Thus, according to the research results, identify athletes who, with motioned disorders, although clinically, using the methods above, it is necessary for fitness instructors. It is hoped that, by trying to resolve anomalies, while emphasizing the pulled muscles and stretch shortened muscles, and use of therapeutic exercise, common knee injuries can be partly prevented

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