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RESEARCH ARTICLE

A SURVEY OF INJURIES TO THE ANTERIOR CRUCIATE LIGAMENT AMONG MAKKAH POPULATION, SAUDI ARABIA: PREVALENCE AND OBSERVATIONS ON INJURY MECHANISM.

Maram Alrubayyi¹, Seham Alzahrani², Areej Alotaibi², Afrah Albalawi², Malak Asiri², Sumayah Alzahrani²,
 Amal Alotaibi² and Shareefah Alenezi².

1. Medical Student, Tabuk University, College of Medicine, Tabuk City, Saudi Arabia.
2. Medical Student, Tabuk University, College of Medicine, Tabuk City, Saudi Arabia.

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Abstract

Objective: To estimate the prevalence, risk factor and mechanism of Anterior Cruciate Ligament Injury among Makkah city, Saudi Arabia.

Design and Setting: A survey reviews the prevalence and the mechanisms of anterior cruciate ligament (ACL) injury. We used a multiple questionnaire, carry out a 266 from the population were interviewed about the events surrounding their ACL injury.

Results: The most common injury of ACL was sport (n = 181). ACL injury occurred due to a sudden increase in running (n=18) and due to stop running suddenly (n=20). Fourteen of them did not report whether their injury occurred in a practice or in a game. Sixteen were listed as road traffic accident and 14 as related to their work. Noncontact mechanisms were classified as sudden deceleration prior to a change of direction or landing motion. Here was the rate of anterior cruciate ligament injury higher in men in compare to the women during the study period. Men's football is a high-risk sport for anterior cruciate ligament injury. Unlike running, basketball, volleyball and gymnastics, The level of allowed contact in pivoting sports may be a factor in determining sport-specific anterior cruciate ligament risk.

Conclusions: We thought that ACL tear is not uncommon in Makkah city population, although ACL still more common in male and in contact injury specially in football player. However protein diet and rehabilitation after surgery shown significance improvement in compare with patient not follow diet and rehabilitation.

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Introduction:-

The anterior cruciate ligament (ACL) is essential to stabilizing ligament of the knee that is frequently hurt by sport and trauma victims. The prevalence rate between 100,000 and 200,000 every year in the United States^[1,2].

The knee joint is complex joint, which movement and stability are adjusted by the collaboration amongst passive and active structures.^[3] The defense systems of knee ligaments include intra-articular and periarticular collagen structures, which are supported by the neuromuscular system.^[3]

Corresponding Author:- Maram Alrubayyi.

Address:- Medical Student, Tabuk University, College of Medicine, Tabuk City, Saudi Arabia.

Anterior cruciate ligament (ACL) injuries are often possible aftereffect of low-speed, noncontact, deceleration injuries and contact injuries with a rotational part. Contact sports also may produce injury to the ACL secondary to turning, valgus stress, or hyperextension all directly related to contact or impact. ^[4,5]

Anterior cruciate ligament (ACL) injuries can occur by a different of mechanisms, including both high-energy and low-energy. Low-energy injuries may include contact mechanism. However, non-contact injuries are more typical, representing approximately 70 percent of ACL tears ^[6,7]. The most common mechanism is a low-energy, noncontact injury to b continuous during an sport movment.

Acute ACL injury is usually followed by pain, knee effusion, and muscular inhibition. ^[8] Steady disability after the acute phase is attributed to expanded knee joint laxity and altered neuromuscular capacity, which may prompt to dynamic joint instability ^[8].

The combination of pop sound during a rotational movement or fast sudden stop, together with powerlessness to proceed participation, and followed by early swelling, is said to demonstrate a 90% likelihood of rupture of the anterior cruciate ligament. ^[5]

the diagnostic accuracy of acute knee injuries in younger patients is not as much as that in adults ^[9,10,11]. The expanded difficulty in correctly diagnosing acute knee injuries in kids has been proposed to be partly because the naturally more prominent laxity in the knees of children, ^[10] and the decreased sensitivity and specific city of magnetic resonance imaging (MRI) may likewise play a role. ^[9] Advances in imaging study and expanded the awareness of ACL injuries in this populace will probably enhance diagnostic accuracy later on ^[12]. The combination of injury history, clinical examination, and imaging specially MRi is recommended to optimize the diagnostic accuracy of ACL injuries in skeletally immature people ^[11,13].

Plain radiographs imaging are often performed after trauma to the knee injuries to rule out fractures, but can't be utilized to diagnose ACL tears. In some cases, an avulsion fracture of the anterolateral tibial plateau at the site of attachment of the lateral capsular ligament (the so-called Segond fracture) is recognized on plain film. Such an injury suggests the presence of an associated ACL rupture ^[14-15].

In the United State, MRI is the essential modality used to diagnose ACL injury. In parts of Europe, ultrasound is frequently used to aid in the diagnosis. Knee arthrograms are just performed in patients in whom MRI is contraindicated and physical examination is uncertain.

MRI is both highly sensitive and specific in the diagnosis of complete ACL rupture. A systematic survey utilizing arthroscopy as the best quality level found MRI to have a sensitivity of 86 percent and a specificity of 95 percent for ACL tear ^[16]. Diagnostic studies, again utilizing arthroscopy as the gold standard, describe sensitivities as high as 92 to 100 percent and specificities as high as 95 to 100 percent ^[17,18]. MRI is less accurate in differentiating complete tears from partial tears, and in identifying chronic tears.

The main goal is to estimate the prevalence , risk factor and mechanism of Anterior Cruciate Ligament Injury among Makkah city, Saudi Arabia.

Methodology:-

Randomized cross-sectional study from the population of Makkah city , Saudi Arabia to determine the prevalence and mechanishm of ACL injuries. Carry out in 266 from the population were interviewed by questioner about the events surrounding their ACL along side with information on the gender, date of birth, date of injury, activity at the time of injury, place, diagnosis, situation of injury, treatment , sport and visits to the hospital . A written consent obtained from each; there was no names or phones or e-mail in the questionnaire. the samples were chosen randomly. A pilot study conducted to establish whether people or the investigators understand the questionnaires. The data was collected and arranged in tables analysis and entered in SPSS software version 23..

Results:-

There were 266 of knee injuries reported , 223 were male and 40 were a females. 266 patients shown the majority of them age between the 20 to 30 years represented 63.5% , while age less than 20 years was 7.6%, from 30 to 40 years 20.5%, 40 to 50 years 6.1% and more than 50 years represent 2.3% .

The ACL injury rate in women shown 15.2%, although it was less than that of the men's rate 84.8%. The difference in the ACL injury rate between the gender was obvious in both practices and games.

The mechanism of their injuries reported mainly in the sports, for instance football represents 78.2%, running 8.4%, basketball 0.4%, volleyball 2.1%, gymnastics 0.4% (Table 1,2). 18 cases of the ACL injury occurred due to a sudden increase in running while 20 cases occurred due to stop running suddenly, 14 cases of them did not report the exact mechanism of their injury. On other hand 16 cases were listed as road traffic accident and 14 cases as related to environmental injury (i.e. work related).

The diagnostic tools of an ACLI were confirmed by Magnetic Resonance Imaging 67.4%, 51.7% were confirmed by physical examination.

This research reported injury as the following : partial anterior Cruciate Ligament injury 23.7%, complete anterior Cruciate Ligament injury 37.9%, partial posterior cruciate ligament injury 6.3%, complete posterior cruciate ligament injury 4.5%, lateral Collateral Ligament injury 13.8%, internal cartilage injury 26.3%, external cartilage injury 15.6%.

Patients who have been suffering from the injury have experienced with these following symptoms; sharp pain 66.9%, swelling 52.9%, redness 19.4%, pop sound 57%, joint lock 37.6%, joint stiffness 17.5%, joint dislocation 5.7% and some of them present with nerve injury like numbness 12.2% and weakness 25.1%, while other patients represent with unusual symptoms like high-grade fever, sore throat and skin rash. the majority of the patient describe the pain 8 out of 10 (18.6%) (Figure 1). Patients who were under diet and rehabilitation during the injury were represented by 18.7%, these patients reported they have less duration of pain, variety between less than 1 week 22.1% and from 1 to 2 weeks 30%, whilst patients who do not follow the diet and rehabilitation they have longer in the duration of the pain and could be reached up to 2 months and less duration of recovery 18.1%.

31.6% they have a history of previous surgery repair of ACL injury. Chronic diseases have not had a significant impact on the ACL injury 90.9%.

21.7% they deny visited the clinic during the injury period, on another hand, 33.5% of the patients reported the pain got worse.

On treatment options this cases were treated by physiotherapy alone 37.6%, surgery 14.1%, combination of physiotherapy and surgery 39.7% and 8.5% of the cases still not receive a medical support with unknown reason.

Table 1:-Causes of anterior cruciate ligament (ACL) injuries

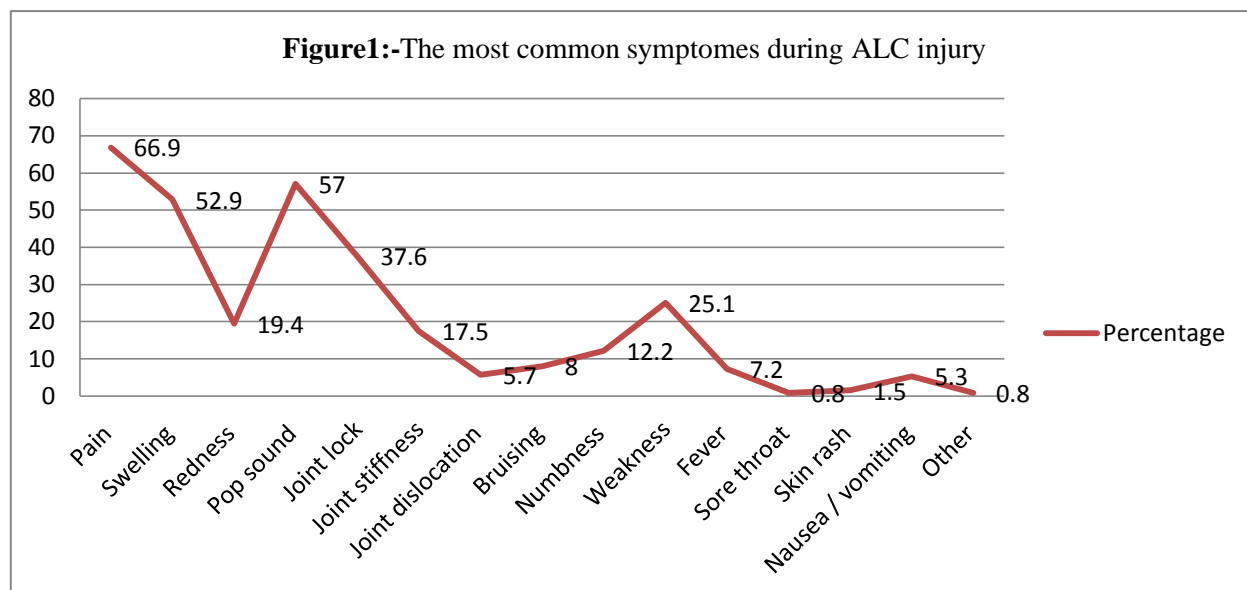
Cause of injury	RTA	Works	Sports	Increase running	Stop running suddenly	Others
No. of cases	16	14	181	18	20	14
Percentage	6.1%	5.3%	68.8%	6.8%	7.6%	5.3%

Table 2:-Work filed that cause anterior cruciate ligament (ACL) injuries

Working field	Government Sector	Military sector	Private	Others
No. of cases	75	21	45	47
Percentage	39.9%	11.2%	23.9%	25%

Table 3:-Type of sports that cause Anterior cruciate ligament (ACL) injuries

Type of Sports	Football	Basketball	Volleyball	Gymnastics	Athletics	Running	Others
No. of cases	187	1	5	1	5	20	20
Percentage	78.2%	0.4%	2.1%	0.4%	2.1%	8.4%	8.4%



Discussion:-

De Loës, et al. ^[19] reported that the combined number of anterior and posterior cruciate ligament injuries was 357 in boys and 113 in girls among participants in sports activities aged between the 20 to 30 years (63.5%). Even though our data focused only on ACL injuries. The differences in data collection methods or in the race may explain this difference. Parkkari, et al. ^[20] reported that participation in organized sports activity (>4 times/week) increased the rate of ACL injury. Some coaches and teachers in Saudi Arabia may impose very long training or practice schedules on young athletes because of the principle of victory supremacy in Saudi culture. Therefore, the amount of activity could have a direct related to the rate of ACL injury here.

The results of this study showed that the rate of ACL injury was highest among 20 - 30 year-olds (63.5%) for both boys and girls. Previous studies reported that there is no tendency for the age of ACL injury occurrence. ^[19,20,21,22]

The results of this study demonstrated that man's had a 5.3-fold greater incidence rate of ACL injuries than did females. Previous studies have also reported gender differences in the incidence risk of ACL injury. ^[6,23,24] Gender differences in anterior cruciate ligament injury vary with activity. A research reported ^[23] that a 2.1-fold greater incidence rate of ACL injuries in girls than in boys among high school and college athletes. Another research that reported ^[24] a 4.5-fold greater incidence in girls than in boys among high school athletes. Also, another research reported ^[25] that the ACL injury rate, excluding male-only sports in military academies, was 1.51-fold greater in women. The difference from the current study may due to lack or decrease of the female sports.

The results of this study also indicate that the greatest rate of ACL injuries was observed in sport football players, so the direct contact was common cause in this research in compared to the non-contact cause. A research was done reported that ^[26] the most severe injury during sport was the anterior cruciate ligament (ACL) ruptures (time loss: 4% of cases 3-6 weeks, 6% 6-12 weeks, 26% 3-6 months, 32% 6-9 months, 18% 9-12 months, 14% >12 months).

Conclusions:-

In this study shown the epidemiological data has been shown differences number of injuries and among males and females in activities. Particularly, strong epidemiological data support increased prevalence of non-contact anterior cruciate ligament injuries.

Conflict Of Interests:-

The authors have no conflict of interests to disclose.

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