

Subject: Risk Factors, Strategy Prevention and Treatment of Anterior Cruciate Ligament Injuries in Female Athletes

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Abstract

Studies your target reviews of risk factors and preventive maintenance and also treatment for harm reduction anterior cruciate ligament (ACL) assigned to help women's sports society. Female athletes with ACL injury such as psychological and emotional problems, social and medical costs high and physical is confronted. So the purpose of the article understand risk factors of ACL injury among women suggested therapy for determining women with risk of ACL injury high. Review search databases Scopus, Pubmed, Cochran, Elsevier, Pedro and google scholar for Assigning Articles performed on the injury anterior cruciate ligament particularly studies conducted on prevalence of the pathology in women that has case studies of ACL injury, especially women, as well as of risk factors and treatment of ligament injury was detected in women. A total of 14 articles in field of check the network among which, six articles various ligament of the anterior cruciate The damaged reviews 3 article with risk high ACL women of the 2 article alone factor risk, 1 Original is also prevention and first article examines of risk factors and treatment only 1 article reviews the epidemiology of ACL injury in women, men.

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The results showed that ACL injuries in female athletes are more likely than men due to differences in neuromuscular. So we have discussed the difference evaluating the Risk Factors and Treatment Studies previous risk of internal and external. According to this study nonsurgical treatments surgical treatment including strength training, plyometric, weight bearing and proprioception whose activities the patient to return to the damage.

Keywords: lower extremity injuries; ACL; athletic women; treatment; risk factors of ligament injury.

1. Introduction

Studies your target reviews of risk factors and preventive maintenance and also treatment for harm reduction ACL assigned to help Female athletes society .This damage is increasing Sport womans. In such a way that sports injuries among great importance in Sport womans [1]. This numerous injuries to the anterior cruciate ligament and meniscus injury can noted, that this was the necessity to use appropriate treatment [2]. the various ligamentous injury, including the psychological state, physical and social compliance. injury of great importance sports injuries sports injuries is also an injury of the anterior cruciate ligament was statistically is fifty percent [3]. anterior cruciate ligament and meniscus injury can be a variety of problems, including knee joint laxity, decreased proprioception, muscle strength and reduce the loss of dynamic stability, that this is reduce the level of activity [4]. Female athletes with ACL injury such as psychological and emotional problems, social and medical costs high and physical is confronted .So the purpose of the article understand risk factors of ACL injury among women suggested therapy for determining women with risk of ACL injury high. studies have shown that women compared with men when anterior cruciate ligament grapple related important to be multifactorial. So anterior cruciate ligament injuries often curative surgery followed by rehabilitation huge for the treatment of anterior cruciate ligament reconstruction such as the United America is assigned [3]. This reflects the importance of identification of risk factors is whom different . in research shown that patients needed to return to sport for anterior cruciate ligament surgical treatment of anterior spinal ligament [4]. anterior cruciate success depends on many factors such as low power rehabilitation program of rehabilitation to be exhibited tendon [5]. several reasons related including neuromuscular difference on the ground anterior cruciate ligament injury in women than in men more critical [6]. anterior cruciate ligament in women type mechanism that is anterior cruciate ligament damage. A review of studies: report presented by shea and colleagues show that has 30.8 percent among soccer players on injured knee anterior cruciate ligament injury has also been allocated 6.7 percent Other . Roos study that higher postinjury meniscus anterior cruciate ligament the coming years will be low. also, Millet and colleagues report that the risk of injury medial meniscus anterior cruciate ligament is postinjury gates up to 6 weeks after the time interval between injury and treatment is important to protect Many sports injuries, including injuries to the cruciate ligament mass Blonde looking into the anterior [7]. This meant that a lot of the risk factors, prevention and treatment of injuries to the anterior cruciate ligament Therefore, understanding the causes and risk factors of anterior cruciate ligament and meniscus injury is essential to choose the best treatment strategies [8]. 3 risk category domestic, foreign divided this study are also 2 treatment for surgical treatment of anterior cruciate ligament, followed by rehabilitation and treatment of non-surgical or recovery carried out. In a review of the patient returning life activities such as sports and sports postinjury anterior cruciate ligament injury has been seen that the top 48 percent of patients never return to sports activities life [9]. several of the world anterior cruciate ligament injury economic, social physical, psychological status Patients time [10]. that these

issues have been in this field more. injury social effects anterior cruciate ligament of the knee, disability postinjury subsequent Rasal [11].

1.1. Risk factors

Risk factors for injury ACL out into three categories, divided in internal and miscellaneous. External risk factors include the type of competition, covering the feet and a level playing field conditions and weather protection devices and internal risk factors include: the anatomy structure, risk factors, hormonal, genetic risk factors neuromuscular include the risk miscellaneous: previous age difference of sex is mentioned.

1.2. External factors

1.2.1. Type of Competition

The competition the game against practicing pile Few studies about competition anterior cruciate ligament injury has been reported. colleagues reported that the extent of damage cruciate ligament When compared anterior race.

1.2.2. protection tools

functional brace has an important role protecting anterior cruciate ligament. by his colleagues expressed the extent of the damage to protect people who use anterior cruciate ligament that had not used [12].

1.2.3. Cover game

shoes has played a major role anterior cruciate ligament. coefficient of friction between the shoes level of play has led to increased damage anterior cruciate ligament. We can say with the ground game. game anterior cruciate injury has led larger coefficient of friction [1].

1.2.4. environmental conditions (climatic conditions)

Sports nature artificial mechanical meteorological factors influencing the playing field is level between the legs Few studies have been done in this regard [12]. the subject has shown that meteorological conditions ACL injury is influencing for example, dry air across a variety of shoes Considering the risk of injury to the anterior cruciate ligament can say that water is deserts. weather as an anterior cruciate ligament injury prevention been considered [1].

1.3. internal risk factors

1.3.1. Anatomical and structural alignment

The abnormal posture of lower limb including increased valgus is resulted in increased ACL injury(12).The women than men differ in several factors such as increased anterior pelvic tilt·hip antversion ·quadriceps angle and geno requrvatom [11]. These factors has shown that lower limb alignment has been one influential factor in

ACL injury because of the differences between women and men. According to these few studies have placed their goal the relationship between lower limb alignment and ACL injury [12]. Various structural and anatomical factors have contributed in ACL injury. These factors have included such as ACL morphology anatomical dimensions of femoral and tibial surface and public anterior laxity of knee joint Female ACL compared with men has dedicated small size in terms of length and cross sectional. That this subject is resulted in future damage of ACL in women than men .On the other hand the larger the slope of the posterior inferior of lateral plateau of the tibia is affected on the anterior tibial displacement that this has increased ACL injury. A number of studies have reported that direct relationship has existed between femoral intercondelar notch width and ACL size and ACL injury Women compared with men has been the more femoral notch height unlike the femoral notch angle that these factors have increased ACL injury. The increased laxity of the knee joint is resulted in hyperextension of the knee joint valgus and ACL injury in women than men . A study by Beckett and his colleagues has shown that foot excessive pronation is considered a reinforcing agent for ACL rupture. So that this excessive pronation of subtalar joint is resulted in the anterior tibial displacement and increased strain on ACL. Increased weight and body mass index (BMI)has played a role in the hyperextension of the knee joint and ACL injury.

1.3.2. Hormonal risk factors

Hormonal risk factors have had important role in ACL injury. On the other hand difference in rates of steroid hormones is resulted in sexual characteristics outbreak. that ACL cells have been included hormonal receptors such as estrogen and progesterone receptors and these hormones have affected ligament characteristics. Difference in rates of estrogen and progesterone hormones has been studied as a predisposing factor for ACL injury. On the other hand in many studies is reported that ACL injury is not considered always as a fixed damage during the menstrual cycle. In many studies is reported that ACL injury has been in preovulation phase at the same time with estrogen hormone production. One systematic review study by Zazulak and his colleagues has shown regarding the effects menstrual cycle on anterior laxity of the knee joint that in preovulation phase of menstrual cycle than postovulation phase is existed more laxity of the knee joint. Change in sexual hormones during the menstrual cycle have followed different changes such as changes in collagen metabolism and more laxity of the knee joint that these factors are resulted in ACL injury [7]. The risk of ACL injury is expressed special days like 9,14 and 28 days of the cycle. In study by Wojtys and his colleagues is reported that the ACL injury in women without of the device of contraction has happened in ovulation phase while such as damage is not reported despite of the device of contraception. Hormones is affected other structures in addition to the ACL so it is affected on muscle contraction process that this has increased ACL injury [10]. The effects of hormones on soft tissue is required the research further more these effects is displayed with delay[12].

1.3.3. Genetic risk factors

These risk factors have had the important role in ACL injury. The injury has been created by a combination of environmental and genetic risk factors in the past. So the effect of genetic on increasing of ACL injury is required further investigation.

1.3.4. Neuromuscular risk factors

Neuromuscular control is had particular importance in reducing of ACL injury. Poor neuromuscular control of lower limb has been a predisposing factor for ACL injury. On the other hand muscle activity during exercise activities like quick shift has been sever that these activities are resulted in ACL injury . Quadriceps muscle activity before hamstring muscle has provided back ground for ACL injury. Muscle fatigue along with other factors is resulted in ACL injury. These factors have provided more research necessity in this back ground.

1.4. Other risk factors

1.4.1 Previous injury impact

Previous injury is considered as one risk factor for ACL injury. So that a study expressed that ACL injury has been more in ACL reconstruction group than control group.

1.4.2. Affects age and sexual differences

Between age and ACL injury there is a direct relationship in both sex. Although in terms of gender can be said girls than boys have more percent of ACL injury.

1.5. Treatment

Different therapeutic purposes is considered for ACL rupture including knee performance maintain and reduce knee osteoarthritis in the years post injury. Treatment is included two parts of surgery and rehabilitation. Many studies have placed their goal the review of this two treatments. Treatment options is done according to many factors like profession and exercise activities. Surgery has been suggested due to the some factors including exercise activity special damages impaired activities of daily living and knee joint injury with the combination of new injuries. In the past treatment was used often in the form of nonsurgical. So that nonsurgical treatments like brace and rehabilitation was considered for a long period of time. The authors of previous studies have used many treatments to prevent the growth plate injuries. If patient has done activities with low risk in this case ACL treatment has been rehabilitation exercises for 3-4 monthes and then assessment of treated knee performance so if there is no proper result of previous treatment ACL reconstruction is done for patient. More degenerative changes must examine with bone-tendon-bone(BTB)graft. Type of graft is used due to the different factors like patient and surgery. On the other hand in hamstring graft have seen in women than men more tears of ACL. More ever rehabilitation after ACL reconstruction is used due to the different factors such as patient and the surgical procedure. Rehabilitation program is included various treatments such as immediate weight bearing active movements and hamstring and quadriceps muscles strength. Pain is resulted in deactivation of quadriceps muscle so electrical stimulations have important role in patient rehabilitation after ACL surgery. Disability in full extension of the knee joint is taken in to consideration after ACL reconstruction. Closed and open chain exercises have been used for quadriceps muscle rehabilitation . On the other hand open chain exercises must use cautious. Treatment as prevention physiotherapist must attend to different aspects such as the patient s physical and mental condition. To rehabilitation is prescribed closed chain exercises proprioception exercises and neuromuscular control. Plymetric exercises have been used in a period of 4-6months after surgery and patients have returned to exercise 7-9 months after surgery. Some studies have noted to the importance of neuromuscular exercises in

rehabilitation for patients [12].

2. Methods and materials

A literature search process in the field of ACL injury in women athletes databases of pubmed, google scholar, Cochran, Elsevier, Pedro and scopus have reviewed 14 papers related with this issue. Article 6: the effect of different treatments on ACL injury and article 3: have payed to risk factors and prevention in ACL injury in women and only article 2 to risk factors and article 1 to prevention of ACL injury in women and other article 1 have payed to an epidemiologic study of ACL injury in women and men. Search in the data base science was by worlds, ("therapy"[Subheading] OR "therapy"[All Fields] OR "treatment"[All Fields] OR "therapeutics"[MeSH Terms] OR "therapeutics"[All Fields]) AND ("anterior cruciate ligament injuries"[MeSH Terms] OR ("anterior"[All Fields] AND "cruciate"[All Fields] AND "ligament"[All Fields] AND "injuries"[All Fields]) OR "anterior cruciate ligament injuries"[All Fields]) AND ("female"[MeSH Terms] OR "female"[All Fields]) AND ("athletes"[MeSH Terms] OR "athletes"[All Fields])) AND (Clinical Trial[ptyp] AND ("loattrfull text"[sb] AND "loattrfree full text"[sb]) AND "2007/01/08"[PDat] : "2017/01/04"[PDat]).

3. Discussion

A study by Allan M. Joseph and his colleagues has been reported extent of ACL injury around 20.5% of knee injuries. The importance of ACL injury is expressed from different aspects such as physical disabilities, high economic costs, loss of time and mental status damage. ACL injuries will follow often various complications like pain, osteoarthritis and disability in the future for patient. Different studies have said the prevalence of ACL injury in women [10]. Therefore risk factors for this damage in women have divided to internal, external and other risk factors. proprioceptive neuromuscular done and focus on reforms biomechanical studies have shown that biomechanical focus is on reform which has led to a decrease in lower extremity injuries in athletes. in this study unlike previous studies, more ever quadriceps muscle strength decrease is known a predisposing factor for degenerative changes in knee joint. Menisctomy in treated athletes has been after ACL injury with many activity [4]. Squat exercise is resulted in quadriceps muscle strenght and rehabilitation improvement. Rehabilitation for patients continues after ACL reconstruction for long time and it is not resulted in full recovery. Functional tests have several applications including assess patient progress and return to activities of daily living. Recovery after treatment has been investigated in terms of internal-external control. These degenerative changes following ACL injury are resulted in stress and osteoarthritis in knee joint. So ACL rehabilitation is concentrated to knee internal-external control that this will result in more effective treatment. Treatment is used either surgery or non surgery, rehabilitation program is included closed chain exercises, endurance and neuromuscular control. Most non-randomized studies were available in only a few prevention programs have been designed as a randomized controlled. Despite these issues, we have enough information in the field of prevention of ACL injuries in female athletes at our disposal [11]. Mandelbaum and colleagues in a study of non-randomized, controlled and prospective, conducted during two years of intervention on the female athletes ranging in age from 14-18 years in Santa Monica, California was doing 844 female athletes from 45 teams in the intervention group and 1913 female athletes from 112 teams in the control group. The two teams based on age and skill match were groups include exercises stretching, strengthening and plyometric that the exercises alternate exercises warm up

were the control group exercises, warm up and did a cut ACL injuries in the intervention group and 88% in the first year and a decrease of 74% in the second quarter, whereas the control group was ACL injury has happened often in athletes society so recovery and return to exercise activities has been very important. A study is shown that fear patient is resulted in no return to sport after ACL reconstruction [12].

4. Conclusions

ACL injury has been often from non-contact type. ACL injury is accompanied with different problems like disability and knee osteoarthritis in the future [11]. This injury is more prevalence in women than men so that quick shift combined with deceleration difference in neuromuscular adaptations and biomechanics of landing technique on the ground including knee extension and valgus stress are resulted in prevalence of this injury in women [6]. The risk factors for ACL injury are divided into three categories :internal, external and other risk factors on the other hand these risk factors have more likely to ACL injury including environmental or external risk factors pre ovulation phase of menstrual cycle compared with post ovulation phase, decreased inter condylar notch width in radiography and increased torque of knee abduction during landing on the ground [12].

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