KNEE TRAUMA IN KSA: AN OVERVIEW

*Abdulnasser Mohammad Alghamdi, AbdRahman Ali Mohammed Alzahrani, Fahd Abdullah Alzahrani

1,2,3Faculty of Medicine, Al-Baha University.

ABSTRACT

The development of health service in KSA has lead to early consideration of knee injury of the Saudi athletes (Sadat-Ali and Sankaran-Kutty, 1985). Recent studies have shown that the incidence of knee injury in KSA is closely similar to the international incidence (Drust et al., 2013). Knee injury cases are presented to the Emergency Department (EM) with joint pain with, 34.6% and without swelling 65.4% (Mustafa Z. et al., 2013). The clinical data is supported by Magda et al., 2015. King Saud Medical City conducted an admirable research work proving the significance of MRI in diagnosis of knee lesions and in modifying the surgical decision (Mustafa Z. et al., 2013).

INTRODUCTION

Since the administrative development of the wealth of sporting facilities in the kingdom of Saudi Arabia (KSA), the General Presidency of Youth Welfare, in 1974, has led the youth of KSA to make full use of them (Fatta, 2016). This development has given rise to the need of a database related to sports injury including the most regionally famous Saudi Arabian Premier Football League (SAPFL). Earlier studies showed that knee injury came on the top of the list of sports injury in KSA (Sadat-Ali and Sankaran-Kutty, 1985). The injury database helps medical staff as well as the sports officials to revise the history of injury of athletes, taking care of newly developed injury aspects, evaluation of causative factors and introducing appropriate management (Drust et al., 2013). This overview studies the knee trauma in KSA, trying to be as comprehensive and thorough as possible.
Incidence and prevalence

At the King Fahad University Hospital, Al Khobar, 1983, a prospective study was conducted for twelve months revealing that 63% of the presented injuries enrolled in the study were athletes under twenty years of age (Sadat-Ali and Sankaran-Kutty, 1985). Further studies were conducted since then revealing the growing of the awareness of KSA officials with the subject. The incidence of sports injuries during Saudi Premier League (SPL) over two seasons, 2010/2011 and 2011/2012 was 8.3 injuries / 1000 h player exposure, out of which 5.5/1000 h during training and 29.7/1000 h during actual play (Drust et al., 2013). This is within the international incidence that ranges from 8.0 – 14.4 injuries / 1000 h (Wai-Yuk Lee et al., 2016).

Site of injury

Knee injury is considered the second most prevalent site of injury among football athletes 16% (Wai-Yuk Lee et al., 2016), while thigh strain, mainly hamstring muscle group, 17%, is ranked first (Eirale and Ekstrand, 2016). Compared to the international ratio, the lower body injury constituted 7.1/ 1000 h, out of which the knee injury represented 1.8 / 1000 h in KSA (Drust et al., 2013) while comprising 18% in a study ran on the Union of European Football Associations (UEFA) players between 2001 and 2008 (Ekstrand, Hagglund and Walden, 2009).

Although the incidence of anterior cruciate ligament (ACL) is considered less than 1% (Eirale and Ekstrand, 2016), it is the most serious lesion as regard the impact on the future career of the athletes. Another study in Hong-Kong shows the finding that the medial cruciate ligament comprises 80% of knee sprain injury (Wai-Yuk Lee et al., 2016).

It is worth mentioning a case study of intra-articular lipoma arborescence (LA) in a 26 years old boy, hypothetically suggested to be due to continuous trauma to the knee, as an indication of the growing of health services in KSA (Al-Shraim, 2011)

Mechanism of knee injury

Knee injury can occur either due to acute injury or overuse injury. The acute injury comprises ACL and middle cruciate ligament (MCL) injury. Swift direction change, abrupt halting, and landing from jump leading to severe deceleration force of a hyperextended joint are the most serious types of ACL injury, while MCL occurs due to collision of the lateral aspect of the knee joint (National Health Service, NHS.UK, 2016). The latter is due to both successive
actions or continuous pressure on the knee (NHS.UK, 2016) that leads to addition of minor damage to the knee structure, including patellofemoral pain syndrome (runner knee) (John P. Cunha, 2016).

Posterior cruciate ligament (PCL) injury usually occurs as a result of falling down on the knee joint in a flexed position, experiencing direct force impact anteriorly, with backward displacement of the tibia (Levy, 2016).

Meniscus tears (either due to acute or gradual damage to the knee), dislocation (due to high-impact, large-force injury), and fractures (due to direct force injury on the knee) are other types and mechanisms of knee injury in common practice (John P. Cunha, 2016).

Clinical evaluation
Patients with knee trauma are presented to the emergency department with either knee pain without swelling 34.6%, knee pain with swelling 65.4%, or knee effusion 63.8% (Mustafa Z. et al., 2013). The combined knee pain and knee swelling represents 35.3% and knee effusion 24.7% in a recent study conducted in King Abdul Aziz Specialist Hospital (Magda et al., 2015).

Evaluation of a patient with knee injury includes ensuring the acuteness of injury, the mechanism of injury and that it is caused by mechanical force (pain exacerbation by movement). Professional physical examination is sensitive, 78-81%, for detecting ACL, PCL, collateral ligament and meniscal injuries (Levy, 2016).

Radiological Evaluation
Magnetic resonance Imaging (MRI): soft tissue injury of the knee constitutes 93.5% of acute cases compared to the osseous injury (Blum and Goldstien, 2016). MRI is considered very vital in determining the knee pathology in patients represented with joint pain and effusion to the emergency department (Yadav and Kachewar, 2014). It is an important investigation modality for accurate diagnosis assisting earlier intervention (Van Dyck et al., 2013). The diagnosis of ACL is much improved by the early MRI determining the proper surgical intervention with great precision (Tuite et al., 2015).

An earlier research in king Saud Medical City was conducted on to determine the incidence of knee injuries of symptomatic patients represented to the hospital. Proving to be a highly sensitive modality in such aspect, MRI succeeded to demonstrate ligament lesions 36.2%,
meniscal lesions 37.9%, joint effusion 63.8% of symptomatic knee pain incidences enrolled in the study (Mustafa Z. et al., 2013). Another study conducted in King Abdul Aziz Specialist hospital demonstrated a statistical significance difference between the clinical symptomatology and MRI findings (P < 0.05) and between these finding and age and sex (P <0.05) (Magda et al., 2015).

**Computed tomography (CT):** it is very valuable in detecting bone fracture of the knee joint, offering 80% sensitivity an 98% specificity is evaluating osseous avulsion, with high negative predictive value in rolling out ligament tear (Spiro et al., 2012).

**Single photon emission computed tomography (SPECT):** this modality shows high sensitivity 90% and specificity 84% for diagnosis of meniscal tear and bone contusion, and is a good predictor of ACL in acute knee trauma, with considerable consonance compared to other modalities (Siegel, Golan and Thein, 2006).

**Ultrasound (US):** it has been estimated to have 91% sensitivity and 100% specificity for diagnosis of ACL in acute stage, within ten weeks and 85% and 86% for meniscal tear (Wareluk and Szopinski, 2012).

**Management of Knee injury**

**EMERGENCY MANAGEMENT**

Emergency management comprises both primary survey (absence of life-threatening conditions) and secondary survey (absence of limb threatening conditions), along with determining the injury mechanism and verifying the hemodynamic instability. Assessing neurovascular damage are of paramount importance prior to handling knee soft tissue injury (Levy, 2016).

Rest, ice, compression and elevation of the knee along with immobilization and crutch walking may be needed initially for ACL and PCL management (Levy, 2016).

**Pain alleviation**

*Injectable analgesics:* instilling lidocaine mixed with prednisolone suspension into the affected bursa helps alleviating aseptic inflammatory pain of the involved busae. Installation of morphia is proved even more effective (Levy, 2016).
REHABILITATION

Rehabilitation is the basic principle of management of ACL and PCL for quadriceps and hamstring strengthening either early, preoperatively or postoperatively (Tarek and Consuelo, 2016). The aim of non-surgical management for PCL is pain control, alleviating joint swelling, pain and instability (S. Peterson and C. Young, 2016).

REDUCTION MANEUVERS

Reduction of locked knee: locked knee of acute onset is due to tear injury of menisci, osteochondral lesion, and ligamentous tear (Brown, Ahn and Nenno, 2016) especially ACL (Hussin, 2014). Various maneuvers have been suggested for reduction of locked knee requiring traction on the flexed and adducted knee together with gentle rocking and rotating movements at the knee joint.

SURGICAL MANAGEMENT

Surgical treatment of ACL

Diagnosis of ACL suffers poor diagnosis as only 14.4% of case are diagnosed in ER by general practitioners (GP) out of 75.1% of patient presented to ER (Hammad, Alex and Christopher, 2016). Patella tendon autograft, hamstring autograft and tissue back tendon allograft are the surgical modality of choice according to the patient preference and surgical experience (Frontera, 2007). Young athletes can perform reconstruction within 3 weeks of injury while older ones should perform the surgery more earlier (Mandelbaum, 2016). American Academy of Orthopedic Surgeons (AAOS) guidelines recommend surgical reconstruction within 5 months for better outcomes along with rehabilitation (Larry, 2016).

Surgical treatment of meniscal tear: Rest and rehabilitation are the basic modality of treatment for meniscal tear. Failure of these measure infers the adoption of novel surgical techniques aiming at replacing the damaged tissue including meniscal allograft transplantation, biosynthetic scaffolds, gene therapy, growth factor and a combination of these (Shiraev, Anderson and Hope, 2016).

CONCLUSION

We came to the conclusion that KSA pays a great attention to providing the utmost health care services possible to Saudi athletes. Knee joint injury represents the most important organ that is subject to injury during sports practice. Therefore, Saudi Arabia directs admirable efforts to record and manage such lesion.
REFERENCES


