



Sports injuries during Kabaddi: a literature review

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Background and Objective: Kabaddi is an athletic contact sport that involves power, aggression, fine mind-body balance, agility, and swift reflexes. Since Kabaddi is a contact sport, athletes face a higher risk of injuries during competition and training. There is a paucity of literature regarding sports injuries during this game. This review article lays down a plinth-stone for global recognition of this game and associated sports injuries, intending to improve awareness in the sports medicine fraternity and boost further research related to this topic.

Methods: A comprehensive synthesis of the relevant literature was conducted to provide insights for clinicians, trainers, and players to enhance injury prevention and rehabilitation strategies.

Key Content and Findings: Kabaddi, a traditional Indian sport, is gaining popularity worldwide. Its physically demanding nature poses a significant risk for sports injuries among players. Anterior cruciate ligament (ACL) ruptures with concurrent meniscal injuries are the most common soft tissue injuries in Kabaddi. However, due to the sport's aggressive and physical nature, nearly all types of injuries are possible.

Conclusions: This review article highlights the mechanisms of injury and common injuries associated with Kabaddi. It also offers a comprehensive overview of the sport's origin, regulations, and etiquette. This review concludes that a multidisciplinary approach involving physiotherapists, sports orthopaedic specialists, and medical teams is crucial for conditioning players and minimizing injury risk.

Keywords: Kabaddi; sports injury; pro-Kabaddi league (PKL)

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Introduction

Kabaddi, also known as Chedugudu, Hu-Tu-Tu, or Pakaada, is a contact team sport popular in the Indian subcontinent. Contact sports involve players engaging in physical interactions, attempting to block or hinder the opposing team or player from securing a victory in the game

or competition. Kabaddi can be traced back to prehistoric times, where it served as a form of entertainment and a method for building the physical strength and stamina required for daily life. The sport was also utilised for self-defence, as depicted in the Hindu Mahabharata, where Arjuna's expertise in kabaddi is highlighted. He was known for penetrating enemy lines, causing destruction, and

returning unscathed. Asian countries have long dominated kabaddi; however, the sport has also gained popularity in Europe, with Poland consistently ranking among the top three teams globally.

The term “Kabaddi” is possibly derived from the Tamil word “KAI-PIDI”, which means to hold hands. Kabaddi has four main variations: (I) Amar; (II) Huttutoo; (III) Suranjeevi; and (IV) Gaminee. Suranjeevi is the version typically played in global competitions, including the Asian Games (1). The game requires no equipment, has simple rules, and is accessible; that is why it is known as the “game of the masses”. This simplicity contributes to its popularity in Asian rural areas, where many young people cannot afford the expensive gear required for other sports.

The literature is scanty in this area, and international recognition of this game goes back to the 1936 Berlin Olympics. Kabaddi was first included in the Indian Olympic Games in Calcutta in 1938, and the Kabaddi Federation was established in 1950, setting standard rules for the sport. The pro-Kabaddi league (PKL) is a professional men’s Kabaddi league in India that started in 2014 (2). It is supported by the Amateur Kabaddi Federation of India (AKFI) and endorsed by members of the International Kabaddi Federation (IKF) and the Asian Kabaddi Federation (AKF). It is the most famous Kabaddi league worldwide and India’s second most-watched sports league. This review article highlights the biomechanics, incidence, and spectrum of sports injuries associated with Kabaddi. We present this article in accordance with the Narrative Review reporting checklist (available at <https://aoj.amegroups.com/article/view/10.21037/aoj-24-62/rc>).

Let’s play Kabbadi—about the game

It is a combative outdoor game played with no special equipment and gear on a rectangular court with seven players on each side of the ground and five additional players on each side. The court is divided into two halves, and the dimensions of the playing field are around 12.5 m × 10 m for adults. The court is either filled with sand to a depth of 1 foot after removing the mud or made using 40- to 50-mm foam mats. Players are only allowed to wear shorts and a vest or T-shirt, and the game is played either barefoot or with soft-soled shoes. The game duration is 45 minutes, which consists of two 20-minute halves with a 5-minute break at halftime, during which the teams switch sides. The game is overseen by a referee, two umpires, and a scorer.

The phases of Kabaddi

Raiding: the game’s goal is for an offensive player, known as the “raider”, to enter the opposing team’s half, tag as many defenders as possible, and return to their side without being tackled, all in a single breath.

Defending: points are awarded for each defender tagged by the raider, while the opposing team scores a point if they successfully stop the raider.

Tackling: players are eliminated if they are tagged or tackled but can re-enter the game when their team scores a point through a tag or tackle.

One half is allotted to the raiders, and the other is for the defenders (3). The raider invades the defender’s field intending to touch as many defenders as possible while continuously chanting the word ‘Kabaddi’ in a single breath (3). If they stop, they must immediately return to their side, resulting in no points for their team and awarding a point to the opposing team for a successful defence. To earn points during a raid, the raider must cross the baulk line into the opponent’s territory and then return to their side of the field without being tackled. The opposing team gains a point if the raider is successfully tackled.

When a player is tagged, they are removed from the game, but one player is brought back into play for each point earned from a subsequent tackle. A raid in which the raider scores no points is called an “empty raid”, while a raid that results in three or more points is known as a “super raid”. If a team manages to eliminate all seven players from the opposing team at once, they receive two extra points, and the opposing players are then reinstated into the game. It is a team game requiring strength and endurance during the tackle; hence, common sports injuries occur frequently.

Sports injuries associated with the game

Kabaddi is a sport that involves strength, agility, neuromuscular coordination, and swift reflexes. Since Kabaddi is a contact sport, athletes face a higher risk of injuries during competition and training. Accordingly, from an orthopaedic perspective, athletes are prone to sustaining injuries demanding skilled sports medicine input. It is a highly ambitious contact sport involving offensive and defensive skills that make the players vulnerable to many sports-associated injuries (3). A cross-sectional study has highlighted the pattern of sports injuries contracted during this sport, with the shoulder (21.25%) the most common site in the upper limb, followed by the arm (5%). The

knee (21.25%) was the most injured site in the lower limb, followed by the ankle (13.75%). The lower back contributed to most of the injuries sustained to the trunk (14.25%) (4).

Very few studies have focused on the epidemiology of injuries in Kabaddi players. Some studies have found that knee and ankle injuries are the most common lower limb injuries sustained during Kabaddi (4,5). Dhillon *et al.* stated that anterior cruciate ligament (ACL) injuries are the most common knee injuries in these players (6). Tear of the ACL was the most common injury pattern (90%), with concomitant meniscal injuries present in 60%. MCL injuries (27%) were the second most common injured ligament, followed by the postero-lateral corner and then the PCL. Another interesting study emphasized concomitant injuries sustained around the knee during kabaddi and concluded that kabaddi players are prone to complex knee injuries compared to football players. Meniscal injuries, both medial and lateral meniscus with associated chondral damage and medial and lateral collateral injury, are seen in these players (7). These injuries occurred in various combinations, with the most frequent being ACL tears accompanied by medial meniscus tears, observed in 40% of the athletes. Calf and thigh muscle injuries, ranging from strains to ruptures, are common, often caused by forceful overstretching beyond the muscle's limits.

Chronic knee conditions can develop due to repetitive strain and improper mechanics, including patellar tendinopathy, commonly known as “jumper’s knee”, this condition results from overuse and is prevalent among kabaddi players. Iliotibial band syndrome arises from friction between the iliotibial band and the lateral femoral epicondyle, often exacerbated by running and quick lateral movements.

Ankle ligament injuries and fractures often result from twisting or landing awkwardly on the ankle. In contrast, few studies reported that most injuries were noticed in the upper limb, followed by the lower limb, and later involved the head, face, and trunk (6,8). Around the shoulder girdle, the most common type of injuries are clavicle fractures, shoulder dislocations, and rotator cuff tears.

Apart from orthopaedic injuries, other Injuries can vary from minor cuts and bruises to more serious conditions such as maxilla-facial fractures, eye injuries, broken teeth, and concussions, which may result in headaches, concentration difficulties, and fatigue (9).

Mechanism of injuries associated with Kabaddi

The literature on sports injuries associated with Kabaddi

and its pathomechanism is sparse. Due to the aggressive nature of the game, no single body part is immune to injury. Discussing all the injuries in depth would be beyond the scope of this review article. Knee, ankle, shoulder/wrist, head, and facial injuries are crucial musculoskeletal areas from a sports injury viewpoint.

Knee

Serious knee injuries such as ACL tears and multi-ligament rupture are growing cause of concern. These injuries can be debilitating from a sports person's perspective. Kabaddi can cause any of the common mechanisms associated with ACL injuries that have been thoroughly documented in the literature. These include deceleration, rotational movements, contact injuries, and valgus collapse (2). ACL is the most common ligament injury during this game (10). Sudden turning and twisting movements are requisite for a Raider to free him/her from the defenders. The rapid and reactive motions involved in starting, stopping, bending, twisting, and changing directions place significant stress on the knee, often leading to ligament injuries. A scissor grip and directly striking the knee are improper techniques that can lead to ACL tears (10). These movements cause strong contractions in the quadriceps and hamstring muscles, which can result in muscle tears and meniscus tears. There is enough literature on managing ACL injuries with or without meniscal tears in high-demanding athletes, but less has been described, particularly in Kabaddi players. A comparative study between soccer and Kabaddi players highlighted a higher incidence of meniscus tears in Kabaddi athletes, particularly in the lateral meniscus, suggesting a greater vulnerability of the knee in this sport (11). Because kabaddi has inherent high-pivot and contact sports characteristics, a recent study found that ACL reconstruction using lateral extra-articular tenodesis is a viable alternative in treating athletes with a higher degree of return to sport at the pre-injury level and a reduced re-rupture rate (12).

Ankle

Ankle sprains are the most common sprains, and they occur during the tackle, particularly when the raider wants to touch someone using a swift kick (back kick, side kick, or roll kick) and one of the defenders grapples the ankle. Sudden twisting forces around the ankle make them prone to injury, although most are low-grade sprains and could be dealt with conservative treatment.

Shoulder and wrist

Very few papers highlight the subset of sports injuries seen in the upper limb. This study looked into the prevalence of injuries involving the upper limb and found that the shoulder is the most commonly injured joint, followed by the arm, forearm, elbow, wrist, hand, and fingers (4). The game of kabaddi involves frequent grappling and pulling movements leading to potential shoulder injuries such as dislocations and rotator cuff tears.

Wrist injuries are not uncommon and could occur during the tackle as the defender can only hold onto the limbs of the incoming raider. Wrist sprains and fractures can occur due to sudden twisting and awkward movements.

Head and maxillo-facial injuries

Most crippling and life-threatening injuries in Kabaddi players involve this territory. These can lead to lifelong repercussions and disability concluding their sports career. A defender may be struck in the face by a direct tackle or daring efforts to touch them during a raid using moves like a high kick or back-kick. An interesting cross-sectional study showed that among 100 Kabaddi players, 29% had experienced tooth chipping or fractures, 100% had suffered lacerations to soft tissues, 12% had experienced tooth avulsions, and 30% had experienced fractures to the jaw or bones (9). The frequency of severe orofacial injuries among Kabaddi players highlights the dangers of contact sports and the need for appropriate training and injury prevention techniques to preserve performance and guarantee player safety (13).

Prevention

Recognising that injuries in kabaddi often result from multiple factors is crucial, as relying on a single preventive measure may not be effective alone. Instead, a comprehensive strategic approach is necessary to establish an effective sports safety framework that addresses all potential scenarios.

Effective injury prevention strategies include:

- ❖ **Strength training:** focus on enhancing strength in key muscle groups, particularly the quadriceps and hamstrings;
- ❖ **Neuromuscular training:** programs that improve balance, agility, and proprioception can reduce injury risk;

- ❖ **Proper warm-up:** incorporating dynamic stretches and sport-specific drills before practice and games.

A comprehensive medical, musculoskeletal, and fitness assessment of the player is essential to identify any existing weaknesses and potential injuries. Due to the significance of legwork in the sport, this assessment should specifically test leg strength and agility.

Sports injury rehabilitation is important, particularly in kabaddi. It requires the expertise of a trained sports physiotherapist to ensure complete recovery and prevent re-injury.

Maan FS highlighted the effectiveness of rehabilitation in treating knee injuries in Kabaddi athletes, showing that techniques like massage, stretching, and strengthening helped reduce pain and improve knee joint mobility (14). Therefore, it is crucial for trainers, in collaboration with a sports physiotherapist, to emphasise biomechanics and incorporate elements like balance, coordination, speed, and strength in their training programs to prevent Kabaddi-related injuries and prepare athletes for competition. Players should take a break from sports activities for weeks to 6 months, depending on the type of injury.

Warming up before matches and training is believed to reduce the risk of muscle strain injuries, as raising tissue temperature by one or two degrees makes muscles more flexible. Ensuring the playing surface isn't too hard to prevent knee injuries is important. Additionally, performing regular knee flexibility exercises can help reduce the risk. The risk of ankle injuries can be greatly minimised by steering clear of uneven ground and choosing supportive shoes. Additionally, keeping a healthy weight can help alleviate stress on the ankle joint. Players should be trained to roll during falls to prevent shoulder injuries, which can lessen the joint's impact. Selva *et al.*'s study revealed that only 42% of the players knew that mouthguards could prevent dental injuries, and just 3% used them (9). Protective gear is recommended to avoid abrasions or cuts, including a face mask to shield against skin injuries and nasal damage. Additionally, a player's diet can influence muscle injuries; consuming a carbohydrate-rich diet in the 48 hours leading up to a match ensures sufficient energy for muscle contractions. Furthermore, recovery after training sessions and matches can be improved by incorporating cool-down and stretching exercises. According to a cross-sectional questionnaire survey, the primary causes of injuries among Tripura's kabaddi players were faulty technique (28%) and inadequate equipment use (24%) along with wrong warming up (32%) (15).

A recent systematic review of sports injuries in Kabaddi players identified common injuries, including ACL tears, knee injuries, traumatic orofacial injuries, frequent traumatic incidents, ankle injuries, and shoulder injuries. However, due to the cross-sectional nature of most studies and the limitations in the design of these reviews, it is challenging to determine the precise prevalence of these injuries in descending order by percentage (16).

Conclusions

This review article aims to highlight the mechanisms of injury and common injuries associated with Kabaddi. It also offers a comprehensive overview of the sport's origin, regulations, and etiquette. Given the limited literature, this review concludes that ACL ruptures with concurrent meniscal injuries are the most common soft tissue injuries in Kabaddi. Due to the sport's aggressive and physical nature, nearly all types of injuries are possible. A multidisciplinary approach involving physiotherapists, sports orthopaedic specialists, and medical teams is crucial for conditioning players and minimizing injury risk. Debilitating injuries, such as complex multi-ligament knee injuries and shoulder soft-tissue damage, can be managed with foundational orthopaedic principles. This review article lays down a plinth-stone for global recognition of this game and associated sports injuries, intending to improve awareness in the sports medicine fraternity and boost further research related to this topic.

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Footnote

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