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Prevention and Rehabilitation of Injuries in Field Hockey

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Field hockey: We know that field hockey is one of the oldest sports in existence as there is evidence of the sport being played 4,000 years ago in Egypt. The modern form of field hockey was developed in England during the 19th Century. Field hockey is a popular team sport played world over on natural grass or on a special type of artificial surface known as the 'Astro-turf'.

Field Hockey Injury: Field Hockey is played by men of various ages, from children to high school and collegiate athletes and even professional league players. It is a rapidly growing sport. Field Hockey is classified as a non-contact sport. However, many acute injuries in Field Hockey result by contact with a stick, ball, another player, the playing surface, or the goal cage. The growing number of participants results in a growing number of injuries. Field Hockey injuries can be either acute or from overuse and repetitive strain.

Acute Injuries: The injuries that occur suddenly are known as Acute injuries. Field Hockey players are typically prone to injuries that affect the hand, wrist, face, ankle, and knee. One of the most common acute injuries is a concussion, which can occur from contact with the ball, stick, or other players. Fractures are also a common acute injury.

There are intrinsic and extrinsic risk factors for injury. Intrinsic factors are a child's individual musculoskeletal issues, which can include skeletal immaturity (bones and joints that are still developing) or muscle weakness. Extrinsic factors are the environment in which an athlete performs, which can include the level of competition: how much, how hard and how long play lasts.

How Injury does happen? To understand injuries and how to deal with them, it's helpful to understand the 'Mechanism of Injury' (MOI). A recurring cause is excessive force.

Force = Mass X Acceleration (too much, and too quick!)

Excessive force to a resisting muscle usually results in a strain. We get these injuries when we apply way too much force to a contracting muscle. Muscles those are not strong enough to resist this force end up being torn. Quite simply, our joints aren't meant to be able to move in every direction imaginable. For instance: when we look at our elbow- one of the most boring joints in the body. Our elbow can flex, and it can extend. We can't make our forearm bend sideways at the elbow joint (abduct or adduct) like our hip or shoulder joint could. If we force it to, we get injured. These injuries cause sprains. This is because ligaments and various other connective tissues limit this movement from happening. Some examples include rolled ankles, shoulder separation, and sprain wrists. All of which suck really bad and hurt a lot. They also take a while to heal, depending on how bad it is.

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The question is whether we can possibly avoid this injury by being flexible? No, we can't. The only thing we can do to avoid this type of injury is be aware of our body, and careful in our technique. Most muscle injuries happen during 'eccentric' contraction where a muscle is working, but stretching too, like lowering a weight within the normal range of motion. If the muscle isn't resisting, we would just drop the weight. Usually we reflexively drop weights that are too heavy, but if you voluntarily resist the load, trouble can ensue. Another common example is quick direction switches during sports. What is to be remembered is it's too much force that's the problem.

Overstretching a muscle MOI is actually very similar to the above, but instead of applying force to the muscle as it resists, we apply force by stretching past its available range. Either way, it's still excessive force that causes the damage. What's different about this is that when we bring our muscle to the end of its length, it tightens up, whether the muscle is active or not. It's like stretching a rubber band: resistance increases as we pull. This is the injury that people try to avoid by stretching. The logic sounds good at first: get more flexible = muscle longer = less chance to overstretch. But in reality it is not so simple. First of all, when we increase our flexibility, how much of an increase in our range of motion do we get? Usually just a few degrees of rotation around a joint. When we overstretch, it's usually an accident, so really we just delay the inevitable by a millisecond!

Furthermore, we can't just make ourselves infinitely flexible. If our muscles are so loose that we can't overstretch them, eventually we are going to start putting force on connective tissue as we keep going further. Then, we get a sprain. Simply being flexible does not help that much. Flexible people still get lots of injuries. This happens when we fall on our butt, and you get a bad bruise. But really bad falls can cause broken bones, concussions (if we hit our head), or worse. At the least, a fall can cause soft tissue injury. Soft tissue injury can appear like both a sprain and a strain. If we damage muscle, it hurts to contract it. If we hurt a ligament, it hurts to move that joint. Sometimes it's not what we do, it's how much we do.

Overuse Injuries: They are also known as Repetitive Strain Injury (RSI). Overuse injuries tend to affect the lower extremity (foot, ankle, and knee) and include sprains and strains. Repetitive overuse can result in a lot of confusing and strange injury-like conditions, which can be best described as 'degeneration'. They are not always inflamed, despite popular belief. They almost always hurt. Pain is a common symptom, and don't always make sense. Sometimes, it's very hard to distinguish whether something is actually an RSI or actually a chronic pain problem (changes in our nervous system, not damage).

It's hard to say what causes the classic overuse conditions: tendinitis, tendinosis, carpal tunnel syndrome, etc. There is even evidence that poor nutrition and abnormal inflammatory processes are important factors in developing osteoarthritis: the classic 'wear and tear' condition was all supposedly doomed to suffer from when we get older.

But one thing is generally agreed upon: we need rest. We can't just keep tearing our body down with activity without giving it a chance to recover. Furthermore, we can't just keep wearing things down without trying to build them back up: which is why it is strongly believed that strength

training is the complimentary training of choice for the majority of all activities.

Prevention of Injuries: The best way to avoid Field Hockey injuries is to learn the proper technique, while wearing any necessary protective gear (goggles or gloves). Players should always be aware, and should not play while fatigued or dehydrated when concentration may be interrupted. Other ways to avoid injury includes: avoid overuse by gradually increasing the frequency, intensity, and duration of training; include regular aerobic, strength, flexibility, and skills trainings; avoid excessive weather conditions of heat, humidity, rain, cold, and more; get plenty of rest to help decrease the risk of overuse injuries; take at least one season per year off from field hockey; do not attempt to "play through the pain" instead seek out the assistance of a sports health professional**;** preseason sports performance training can decrease the risk of injury while increasing the performance level of the athlete.

In order to prevent injuries from sticks and the ball, all hockey players now wear shin pads and gum shields (mouth guards). Although gum shields can prevent damage to the mouth and teeth when the ball is lifted, other facial injuries can occur, including fractures to the cheek bones. Other protective equipment sometimes worn includes a glove on the left hand. This was developed once play on astro-turf became the norm as stopping the ball with a reverse stick can cause abrasions on the knuckles of the left hand. In recent years defenders have also begun wearing face masks when defending penalty corners. Footwear should also be considered. Often teams at a local level will play on a mixture of grass and artificial surfaces, meaning that ideally different footwear should be worn for each surface. Grass will usually require the use of studded football boots to provide adequate grip and prevent injuries through slipping over. This kind of boot cannot however be worn on artificial surfaces.

The goalkeeper wears considerably more protective clothing than the outfield players. This includes a helmet with a face guard, chest pad, leg pads, gloves and boots. Warm-ups should not be overlooked in any sport as they can be a vital and effective part of injury prevention when performed correctly. A warm-up should consist of a pulse raiser activity, usually jogging, to get the heart rate up and warm the muscles. This should last for approximately 10 minutes and should be followed by active stretches to improve muscle elasticity (such as heel to bum and carioca exercises). Static stretches can also be performed if required. A warm-up should then finish with skill drills to promote motor control and coordination, including dribbling, pushing and shooting practices. In total, a warm-up should last around 20 minutes.

Training is equally important as with all sports, the athlete must be fit for the game in hand. This includes cardiovascular fitness, which will enable your heart, lungs and circulatory system to provide enough oxygen to the working muscles to maintain a high level of work for long periods and to recover quickly during rest periods. One must also possess the muscle strength and endurance required to produce repeated contractions over this same period. All of this should be achieved through regular training, which is specific to the sport. Pre-season conditioning is also important, as research has shown that more injuries occur in the first part of a season, indicating that players are not fit enough following an off-season break.

A sprained ankle is one of the most common injuries in hockey. A sprain is a tear or complete rupture of a ligament, and in the case of the ankle, the most commonly injured ligament is the

anterior tibia fibular ligament. This ligament lies on the outside of the joint and is injured when the player rolls the ankle so that the sole of the foot faces inwards.

Cartilage injury within the knee joint occurs most often due to a twisting force being applied to the knee when the foot is firmly planted on the ground. This occurs when trying to change direction quickly in dodging an opponent. The cartilage which is damaged is in the form of two rings which sit on top of the shin bone (tibia), within the knee joint, one medially and one laterally.

The ACL is the anterior cruciate ligament, which sits deep within the knee joint and is vital in providing stability to the knee joint. The ACL is commonly injured in non-contact sports just as frequently as contact sports. The usual mechanism involves a twisting motion at the knee. The player will feel immediate severe pain, which may fade quickly, followed by substantial swelling and a feeling of instability.

A hamstring strain, or pulled hamstring is a common injury across all sports. The usual mechanism of a hamstring injury is during a short burst of speed when running. The hamstrings are placed under most strain whilst they act to decelerate the forward movement of the lower leg.

The groin, or adductor muscles are commonly injured in fast paced sports requiring sudden changes of direction. The action of the groin muscles is to bring the leg towards the centre and across in front of the body. The muscles are most commonly injured when they are stretched and the leg is taken away from the centre of the body. Find out more about groin strains.

A contusion occurs as a result of a direct impact to a muscle, most commonly the thigh muscles as a result of being hit with the ball or a wayward stick. This compresses the muscle against the underlying bone causing muscular damage and bleeding. This is sometimes also known as a dead leg due to the feeling it can produce. There will usually be extensive bruising. Find out more about contusions.

Injuries to the face do happen, usually as a result of an illegally lifted ball or a stick raised too high. Cuts and bruising occur most frequently, although fractures to the jaw, cheek and nose are not uncommon. Find out more about facial injuries.

Rehabilitation of Injury: Most of field hockey injuries, whether they affect the muscle, ligament, tendons, or bone, are characterized by bleeding immediately after the injury. A muscular hematoma can occur as early as 30 second after a muscle injury. Therefore, the goal treatment for field hockey injuries is to limit internal bleeding as much as possible and prevent or relieve pain, in order to improve to condition for subsequent treatment and healing of injuries.

Measures to limit bleeding after injuries have traditionally been called ICE therapy, an acronym for Ice (cooling), Compression (with a pressure bandage) and Elevation (of the injured part of the body). Recently this acronym has been expanded to PRICE, with P standing for protection and R for Rest. The PRICE principal has become well established.

The goal of rehabilitation is to bring the patient back to the desired activity level. Hence, it is necessary to eliminate the pain and re-establish range of motion, technique, and coordination,

while avoiding the loss of muscle strength and endurance, during the period cannot train maximally. Rehabilitation can be divided into three stages:

1. Acute stage- lasts a few days to weeks
2. Rehabilitation stage- lasts from week to month
3. Training stage- lasts a few days to month

Acute stage: The main goal of acute stage is to avoid having the injury worsen, and consequently the athlete often has to reduce or completely stop participating in routine training are competition. The type of injury that the athlete sustains and the sports in which the athlete is involved will determine how long she will have to stay away from sports. For acute injuries, the principal of PRICE therapy apply often with brief or total immobilization and initial unloading. If the patient has an overuse injury, partially unloading the injured structure may also be necessary to begin with. Complete unloading is rarely necessary when treating overuse injuries. Some patient may correct malaligament by using specially adjusted insoles running shoes- for example, to provide medial support correct overpronation. Unloading may also be accomplished by choosing appropriate shoes, by using shock-absorbing sole or heel cups, or possibly by relieving pressure with felt pads or similar devices. Protection against blows or impact can be achieved with the help of specially fitted braces.

Rehabilitation stage: During this stage the main goal are to prepare the athlete to train normally and in full. That it is necessary to ensure:

- Normal range of motion
- Normal strength
- Normal neuromuscular function
- Normal aerobic capacity

Pain and swelling are the main consideration when determining how much and what type of training to use during rehabilitation. The usual rule is to train at a level that does not cause pain. However, this is a debatable. Many factors indicate that it is necessary to tolerate some pain, at least as long as pain or swelling does not worsen from one training session to the next. Gradual progressive pain or swelling is a sign that the training needs to be reduced or the patient may need to consider other type of training.

The best way to re-establish normal range of motion is for the patient to use active stretching exercise. This may not succeed at first. If it does not, the patient will need to train with passive stretching or stretch with the assistance of equipment or a therapist. Normal range of motion is key, because it is a prerequisite for returning the athlete to normal technique. In addition, reduced range of motion may limit the patient's ability to do strength training. For example, a patient who does not have full extension in his knee may not be able to train his vastus medialis muscle, and consequently, it will not be possible to optimize his knee function.

To maintain general strength and muscular endurance, alternative forms of training are used that do not load the injured area. Examples of this are bicycling, swimming, or running in water. In

addition to alternative training, the athlete must also engage in specific training- that is, training that affects the injured structures. The amount (including intensity, frequency, and duration) of training stimuli will depend on the location of the injury, which tissue is injured how long the patient has had the injury, and any surgical intervention. In this connection, the practitioner should remember that all training is specific. The athlete improves only in what he trains for. When an athlete retrains after an overuse injury, it is necessary to place the greatest emphasis on exercises that train for both the type of strength (concentric, eccentric, or isometric) and for the muscle groups that the athlete requires for his sports.

Training Stage

The goal of the training stage is to ensure that the athlete regains his normal ability to perform in sport, to tolerate the loading that is unavoidable in competition, and to tolerate normal amounts of training before being allowed to compete again. The training is a critical phase for top athletes. A previous injury is the chief risk factor for sustaining a new injury, probably because many athletes return to competitive sport before they are completely rehabilitated after previous injuries.

During this stage it is important for the athlete and the coach to ensure a gradual transition from controlled rehabilitation to exercises that are more and more like the sport itself. The role of the physician and the physical therapist is to ensure that the athlete undergoes practical testing to determine whether he can tolerate the anticipate loading required for competitive activity. This is often difficult, because pressure is maximal only during actual competition. However, the test situation should come as close as possible to emulating a competitive situation. Only after the athlete has this type of test, and is mentally prepared to resume competition, should he be allowed to participate again.

Conclusion: Thus we see that injury in field hockey is inevitable but can be reduced to minimum level by taking precaution and training etc. It is due to injuries that in India there are several players who are unable to go to higher platform in order to perform in spite of having caliber. This is the greatest loss for our country. This paper is to bringforth the importance of Sports Medicine and to enhance its growth in India so that we may come to terms to other countries and win several International Sports events.

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