

Miran Kondrič

* University in Ljubljana, Faculty of Sport

INJURIES IN TABLE TENNIS PLAYERS

As a result of increasing participation, intensity, demands and longer training periods, the potential risk of injuries in table tennis seems to increase in all levels of athletes. It is necessary to understand what factors have to be involved in an injury-prevention strategy for sports activities of a table tennis player. On the sample of 17 top Slovenian table tennis players we have studied the frequency of injuries among the table tennis players, types of injuries and severity of injuries – the latter based on data of players absences from training and/or competition processes. Although table tennis is one of the less risky sports, there are some injuries in best Slovenian players. The most liable parts to injuries are shoulder girdle, spine, wrist and ankle, while other parts of body are less liable to injuries. According to this data, the majority of injuries occur halfway through a training session. The injuries primarily pertain to muscle tissues; these are followed by tendon injuries.

Table tennis is not only one of the most popular sport in the world but also one of the most common sports for people in aged from 7 to 99 not only as recreational sport, but also as a high level sport and sport for rehabilitation. Table tennis is an ideal sport for young and old because of its extremely low risk of injury (Kondrič, Furjan-Mandić, Mišigoj-Duraković, & Karpļuk, 2001). The statistical data on acute and chronic injuries in sport show that table tennis is way at the end of the list. There are hardly any injuries reported in recreational table tennis (Weber, 1982; Scott, 1992; Hochenbichler, 1992). Jørgensen and Winge (1987).

A number of top athletes in Slovenia is increasing which means that we are facing a problem of sport injuries. Because these injuries occur during sport activities (training and competition), the role of physicians goes beyond a mere diagnosis and injury treatment; Physicians are required to take part in the rehab process, training advisory, they help athletes get back to practicing sport and help decrease the risk of potential injuries. Having this in mind, we must be aware of the problem complexity (Dervišević, & Hadžić, 2002).



As with any other sport, there are some injuries that are typical of table tennis. Sport medicine findings, along with medicine and science findings, inevitably contribute to injury prevention and injury treatment programs for the players. For effective prevention, it is important to understand the functional anatomy and patho-physiology of injuries of different tissues. For injury prevention it is also necessary to understand the importance of excessive load and how these loads are distributed, sports-injury mechanisms, and the biochemical response of body tissues to impact and overuse (Kondrič, & Furjan-Mandić, 2003).

Sports medical examinations of table tennis players should not merely be an additional examination by a primary care physician. A physician who exam table tennis player must have, in addition to expertise in anatomy and physiology of the human body, also a profound

knowledge of various loads, which often reach the limit or even exceed an athlete's physiological capabilities.

Generally, sport injuries can be classified as trauma and overuse injuries. Trauma injuries occur as a consequence of a specific accident or event. Such injuries are sprains and dislocations. Overuse injuries develop gradually and they can occur during a training or competition, or they gradually develop for weeks or months. A typical example of overuse injury is Achilles tendon injury. The player first feels a slight pain after a training process. Over the night, the pain is gone but reappears after each consecutive training. The damage progressively becomes worse and results in serious problems. Causes of sport injuries vary, from inadequate warming up, insufficient physical shape, inappropriate training, short rehabilitation process, anatomic factors, improper sport technique, inappropriate footwear, inappropriate protective equipment, inappropriate practicing surface, previous injuries and other.



The aetiology of overuse injury is multifactorial, involving both intrinsic and extrinsic factors. Intrinsic factors are related to the athletes themselves, including anatomical, alignment, growth/age, muscle tendon imbalance, genetic endowment, general health, nutritional status and prior injury (Sparrow, 2001; in Maffullin et al, 2001). Extrinsic factors include training error, equipment inadequacy and environmental factors (Brukner, & Khan, 1997). The impact of each of these factors on the clinical presentation needs to be evaluated in order to gain an accurate diagnosis around which the treatment can be planned.

A good knowledge of these factors and appropriate measures taken to solve them is a prerequisite to prevent a number of injuries, or at least to decrease the injury incidence and severity in table tennis and badminton. The incidence of injury levels needs to be reduced and it can be achieved by concentrating more on preventative measures.

Participation in competitive sports places the athlete in a situation in which injuries are possible at any given time. Based on the results of the study, it can be presumed which prevailing risk factors are causing an injury to occur, and plan the injury prevention measures accordingly. Traditionally, table tennis has been associated with a low injury rate. However, the number, distribution and nature of injuries within table tennis have not been well defined due to poor injury definition reporting. We are aware that national associations and also ITTF have to put more effort to collect data about injuries of table tennis players. Only this way we can find out reasons why players are injured and how to prevent those injuries.

The highest in number of injuries, as expected, are shoulder girdle injuries. According to extreme loads of the shoulder girdle in table tennis due to bigger ball (40 mm) it can be concluded that a higher number of injuries in table tennis is a result of short, abrupt and extremely rapid movements, particularly in forehand strokes. With the introduction of a bigger ball, these strokes have become even more abrupt. (Kondrič, Furjan-Mandić, & Medved, 2003).

The integrated functions of the rotator cuff muscles and the scapular stabilizers, coupled with the large multiplanar movements inherent in table tennis skills, make the shoulder complex vulnerable to injury. Successful rehabilitation programs for injury to the shoulder complex must be tailored to the individual, based on accurate diagnosis of the tissue damage and pathomechanics, clinical signs, stage of growth and specific table tennis skills demands. As many table tennis players experience pain only during specific skill execution, normal physical testing of the shoulder is often not sufficient to reproduce the table tennis player's pain. Therefore, functional testing must be used in order to identify the pain-provoking position with estimation of the force, direction and magnitude of muscle activity.

There are more injuries that occur during a training period. The result is not expected as the number of risk factors increases – such as considering the opponent, violation of fairplay, increased motivation – and consequently athletes are overdoing (enthusiasm), and considering all other factors putting players at risk on the competitions. This is particularly interesting because it possibly indicates inadequate warming up, lack of stretching exercises prior to practicing and similar. Unfortunately, even at major events such as World or European championships, it is evident that some top athletes are either not familiar or are not well informed about proper warm-up and stretching. Just look some players how they prepare themselves for the match. Proper warming up demands from player exact realization of the exercises.



The most frequent injuries in table tennis pertain to muscle tissues, followed by tendon injuries. These records more or less correspond to the epidemiology of sport injuries records in the world literature. Percentage wise, the shoulder joint injuries are ranked highest, which again corresponds to the world epidemiology records. Shoulder is the most flexible body part and therefore most vulnerable.

In table tennis, the trunk is significantly involved in first of all top spin strokes that players perform. Any factor that reduces the range of motion or impairs the muscle control of the trunk inhibits the efficient transference of force, leading to compensation and potential injury. Accurate figures for the incidence and nature of low back pain and injury in table tennis players are difficult to establish due to the limited prospective sport-specific research.

To perform an efficient initial stroke (e.g. serve in table tennis), the player must have a very flexible wrist. This is also true for some other types of strokes in table tennis (e.g. flip or lately penholder backhand with BH side), performed from the wrist. The wrist is a complex functional unit. While acute injuries can, and do, occur, the greatest presentation is for non-specific wrist pain often associated with chronic stress-related reaction implicating the growth plates. Grip strength testing can be used as a useful screening and evaluating tool in managing chronic wrist pain.

The complex structure and function of the foot and ankle are essential for effective footwork of table tennis players. Like the wrist, the ankle has little local muscle support, relying for its function on mechanical efficiency of its capsular and ligamentous structures; and unlike the knee, the ankle joint has no major surrounding stabilizing muscles. The lateral collateral ligaments and the medial collateral ligament, or deltoid ligament, establish the ligamentous integrity of the ankle joint, and these structures limit and stabilize the range of motion at the ankle joint. Because of fast lateral movements in table tennis, the integrity of the foot is essential, as shoe support and orthotic devices cannot be used to modify poor foot biomechanics (Sbutega & Sbutega, 2007).

Training errors are the most common cause of overuse injuries. These errors involve a too rapid acceleration of the intensity, duration or frequency of player's activity. Overuse injuries also happen in people who are returning to a sport or activity after injury and try to make up for lost time. There are also technical, biomechanical and individual factors. Proper technique is critical in avoiding overuse injuries. Due to a large number of injuries in training session players should be adequately prepared with warm-ups and training sessions before practices as well as before games. This will help ensure that that player has fun and reduce the chances of an injury. Differences among table tennis players in hours of practice session, physical preparation and stretching show us that there has to be done more that it was till now.

Some players are more prone to overuse injuries and this is usually related to anatomic or biomechanical factors. Imbalances between strength and flexibility around certain joints predispose to injury. One major responsibility of the table tennis trainer is to make the training and competitive environment as safe as possible to reduce the risk of injury. If an injury could have been prevented initially, then there would have been no need for first aid and subsequent rehabilitation. The trainer, in cooperation with the team physician and doctor, should obtain a medical history and conduct physical examinations of the players before participation as a means of screening for existing or potential problems.

In addition, the database records obtained in such studies contribute to health care planning and organization for top Slovenian athletes, who inevitably require a better and qualitative medical supervision primary care physicians could offer.

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