

# Review of the injuries in junior and university tennis

Oriol Amer Orfila and Josep Campos-Rius

## ABSTRACT

This article will carry out a review of the current state of injuries in adolescent tennis with the aim of determining what the most common injuries are. Various review and intervention articles will be analysed, finding that the ankle, shoulder, back and knee are the most common injuries in junior and university tennis.

**Key words:** injury incidence, injury classification, adolescent tennis

**Received:** 17 January 2019

**Acepted:** 20 January 2019

**Corresponding author:**

Oriol Amer Orfila

Email:

[oriolamerorfila@gmail.com](mailto:oriolamerorfila@gmail.com)

and [josepcampos@gmail.com](mailto:josepcampos@gmail.com)

## INTRODUCTION

Tennis is one of the most popular sports in the world and attracts people of all age groups, with participation in the 200 countries affiliated with the International Tennis Federation (ITF, 2017) and even more. In recent years the evolution of tennis, characterized by the increased power and speed of the game, has provoked the appearance of new pathologies, and in many cases at a younger age where they have never existed before (Clínica MAPFRE de Medicina del Tenis & Fundación MAPFRE, 2015). For this reason, coaches and physical trainers need a good knowledge of the current state of tennis injuries in the youth categories up to the university stage.

The aim of this article is to analyse the existing scientific bibliography regarding the injuries of junior and university tennis players and to determine which injuries are most common.

## METHOD

This article carries out a review of the existing literature regarding the injuries of youth tennis players (10-22 years old). Experimental scientific research articles as well as other systematic review articles have been included. The parts which have been included and analysed are: injuries, classification of injuries, anatomical location of injuries.

## OCCURRENCE OF INJURIES

Currently, the available statistics regarding the injuries of junior tennis players are very disparate mainly due to two factors. Many of the statistical data collection studies of the junior level date from between 1989 and 2015 (Lanese et al., 1990; Weijermans et al., 1998; Spinks et al., 2006; Hjelm et al., 2010; Colberg et al., 2015; Pluim et al., 2016), which gives great discrepancy in the results due to the generality of the data in the earlier years and the specificity of the data in the most recent studies. Secondly, a criteria does not exist amongst the authors to determine what is considered an injury, so therefore the criteria of which injuries to include is disparate between the studies as can be seen in Figure 1.



1.

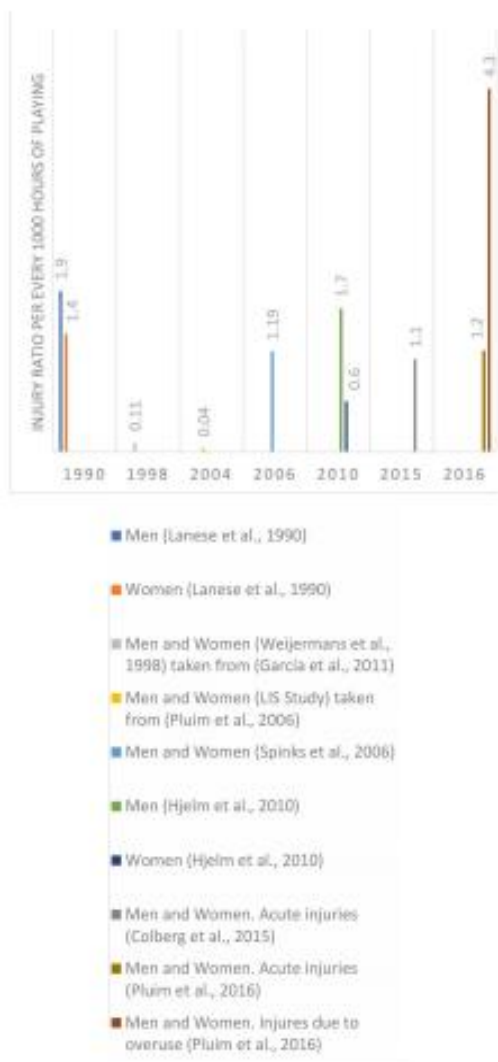


Figure 1. Injuries per every 1000 hours of playing junior and university tennis. Source: Prepared by authors.

	(Hutchinson et al., 1995)	(Silva et al., 2002)	(Hjeltn et al., 2010)	(Lynall et al., 2015)	(Pluim et al., 2016)	(Spinks et al., 2017)
Acute (not specifying the type)				Male Female	25/187 (13.3%)	
Chronic (due to overuse)	84/143 (58.6%)		54/100 (54%)		88/187 (47%)	88/113 (77%)
Traumatic injuries			46/100 (46%)			
Sprains		12/280 (4.28%)		26/181 (14.4%)	34/227 (15%)	
Muscle tears	18/143 (12.55%)	35/280 (12.52%)		56/181 (30.9%)	66/227 (29.1%)	
Muscle contractures		76/280 (27.14%)				
Fractures				5/181 (2.8%)	5/227 (2.2%)	
Head Traumas				2/181 (1.1%)	4/227 (1.8%)	
Dislocations	1.32/143 (1%)			6/181 (3.2%)	1/227 (0.4%)	
Lumbar Pains				4/181 (2.2%)	4/227 (1.8%)	
Other	10/143 (7%)			33/181 (18.2%)	52/227 (22.9%)	

Table 1. Classification of the injuries in junior and university tennis between the years 1995 and 2017. Source: Prepared by authors.

	(Hutchinson et al., 1995)	(Hjeltn et al., 2010)	(Clínica MAPFRE de Medicina del Tenis & Fundación MAPFRE, 2016)	(Colberg et al., 2015)	(Lynall et al., 2015)	(Pluim et al., 2016)
	Male Female	Male Female	Beginners High competition	Male Female	Male Female	Acute Chronic
Ankle and foot	16/543 (29%)	14/78 (17%)	17.40% 42.70%	7/99 (7%)	11/181 (6%)	8/26 (30%) 11/98 (11.2%)
Hip and groin	11/543 (2%)		5.40% 11.30%	1/99 (1%)	16/181 (8.8%)	11/227 (4.8%) 4/98 (4.1%)
Knee	8/543 (1%)	9/78 (11.5%)	9.40% 28.30%	1/99 (1%)	14/181 (7.7%)	11/227 (4.8%) 16/98 (16.3%)
Wrist and hand	14/543 (2.6%)		11.20% 11.30%	1/99 (1%)	11/181 (6.1%)	14/227 (6.2%) 1/98 (1%)
Shoulder	11/143 (8%)	11/78 (14.1%)	11.20% 29.80%	7/99 (7%)	16/181 (8.8%)	11/227 (4.8%) 16/98 (16.3%)
Back	11/543 (2%)		5.40% 14.30%	6/99 (6%)	10/181 (5.5%)	11/227 (4.8%) 11/98 (11.2%)
Elbow	11/543 (2.0%)		7.40% 22%	2/99 (2%)	11/181 (6.1%)	11/227 (4.8%) 1/98 (1%)
Leg	8/543 (1.5%)					1/98 (1%)
Upper extremity		11/78 (14.1%)				
Thigh	21/543 (3.9%)			6/99 (6%)	11/181 (6.1%)	11/227 (4.8%) 11/98 (11.2%)
Lower leg (not specified)					11/181 (6.1%)	11/227 (4.8%) 11/98 (11.2%)
Forearm				1/99 (1%)		
Abdominal				1/99 (1%)		
Unidentified	4/543 (0.7%)			1/99 (1%)		
Other					8/181 (4.4%)	7/227 (3.1%) 4/98 (4.1%)

Table 2. Anatomical location of the injuries in junior and university tennis between the years 1995 and 2017. Source: Prepared by authors.

## CLASSIFICATION OF INJURIES

The differences between the different types of injuries analysed may come from various factors such as: the year in which the study was carried out, the physical characteristics of the players analysed, the different surfaces on which the study was carried out, and each author's criteria for recording data.

Table 1 shows the data extracted from each of the articles from which statistical analysis has been carried out and from which the following results have been found:



- 20.5% of injuries are acute injuries whilst 59.15% are chronic and the remaining 20% of injuries are not specified or are of less interest.
- Within the acute injuries we can establish that the most frequent in tennis are muscular injuries such as strained, pulled and torn muscles (12.52-30.9%) followed by sprains (4.28-17%).
- Fractures (2-2.8%), dislocations (0.4-3.3%) and trauma (1.1-1.8%) are very rare in this sport.

## ANATOMICAL LOCATION OF INJURIES

In recent years various studies have been published about junior and university tennis players (Hutchinson et al., 1995; Silva et al., 2003; Hjelm et al., 2010; Lynal et al., 2015; MAPFRE et al., 2015; Colberg et al., 2015; Pluim et al., 2016; Sluis et al., 2017) where they have recorded injuries according to their anatomical location. In Table 2 we can see a summary of the data recorded between 1989 and 2016, from which the following results have been found:

- The lower extremity sees a greater range of injuries (2-42.7%, followed by the upper extremity (1.1-33.7%) and finally the core (3-17.6%).
- The areas in which we can find the highest amount of injuries are the ankle ( $21.6 \pm 10.04\%$ ), shoulder ( $16.2 \pm 6.97\%$ ), back ( $13.8 \pm 4.84\%$ ) and knee ( $12.7 \pm 7.55\%$ ).

This review demonstrates that:

- We cannot establish a trend regarding the occurrence of injuries over the years

- Chronic injuries (59.1%) are more frequent than acute injuries (20.5%). Within the acute injuries the most common are muscle tears (12.52-30.9%) followed by sprains (4.28-17%). Fractures, bruising and trauma are very rare due to the nature of the game.
- The lower extremity sees a greater range of injuries (2-42.7%, followed by the upper extremity (1.1-33.7%) and finally the core (3-17.6%). The ankle ( $21.6 \pm 10.04\%$ ), shoulder ( $16.2 \pm 6.97\%$ ), back ( $13.8 \pm 4.84\%$ ) and knee ( $12.7 \pm 7.55\%$ ) are the areas most often injured in the sample analysed.

## REFERENCIAS

- Clínica MAPFRE de Medicina del Tenis & Fundación MAPFRE. (2015). Las lesiones en el tenis y su prevención, 1-20. Recogido de [https://www.fundacionmapfre.org/documentacion/publico/i18n/catalogo\\_imagenes/grupo.cmd?path=1087681](https://www.fundacionmapfre.org/documentacion/publico/i18n/catalogo_imagenes/grupo.cmd?path=1087681)
- Colberg, R., Aune, K., Choi, A. & Fleisig, G. (2015). Incidence and Prevalence of Musculoskeletal Conditions in Collegiate Tennis Athletes. *Medicine & Science in Tennis*, 20(3).
- Hjelm, N., Werner, S. & Renstrom, P. (2010). Injury profile in junior tennis players: a prospective two-year study. *Knee surgery, sports traumatology, arthroscopy*, 18(6), 845-850. <https://doi.org/10.1007/s00167-010-1094-4>
- Hutchinson, M., Laprade, R., Burnett, Q., Moss, R. & Terpstra, J. (1995). Injury surveillance at the USTA Boys' Tennis Championships: a 6-yr study. *Medicine and science in sports and exercise*, 27(6), 826-831 <https://doi.org/10.1249/00005768-199506000-00006>
- International Tennis Federation (2017). National Association Updates. Recogido de <http://www.itftennis.com/about/misc/national-association-updates.aspx>
- Lanese, R., Strauss, R., Leizman, D. & Rotondi, A. (1990). Injury and disability in matched men's and women's intercollegiate sports. *American Journal of Public Health*, 80(12), 1459-1462. <https://doi.org/10.2105/AJPH.80.12.1459>
- Lynall, R. C., Kerr, Z. Y., Djoko, A., Pluim, B., Hainline, B. & Dompier, T. P. (2015). Epidemiology of National Collegiate Athletic Association men's and women's tennis injuries, 2009/2010- 2014/2015. *British Journal Sports Medicine*. <https://doi.org/10.1136/bjsports-2015-095360>
- Pluim, B., Loeffen, F., Clarsen, B., Bahr, R. & Verhagen, E. (2016). A one-season prospective study of injuries and illness in elite junior tennis. *Scandinavian journal of medicine & science in sports*, 26(5), 564-571. <https://doi.org/10.1111/sms.12471>
- Silva, R., Takahashi, R., Berra, B., Cohen, M. & Matsumoto, M. (2003). Medical assistance at the Brazilian juniors tennis circuit-a one-year prospective study. *Journal of science and medicine in sport*, 6(1), 14-18. [https://doi.org/10.1016/S1440-2440\(03\)80004-X](https://doi.org/10.1016/S1440-2440(03)80004-X)
- Sluis, A., Brink, M., Pluim, B., Verhagen, E., Elferink-Gemser, M. & Visscher, C. (2017). Is risk-taking in talented junior tennis players related to overuse injuries?. *Scandinavian journal of medicine & science in sports*, 27(11), 1347-1355. <https://doi.org/10.1111/sms.12729>

Spinks, A., Macpherson, A., Bain, C. & McClure, R. (2006). Injury risk from popular childhood physical activities: results from an Australian primary school cohort. *Injury Prevention*, 12(6), 390-394. <https://doi.org/10.1136/ip.2006.011502>

Weijermans, D. & Van Mechelen, W. (1998). Blessures bij outdoor tennis. *Geneesk Sport*.

RECOMMENDED ITF TENNIS ACADEMY CONTENT (CLICK BELOW)



Copyright (c) 2019 Oriol Amer Orfila and Josep Campos-Rius



This text is under a [Creative Commons BY 4.0 license](#)

You are free to Share - copy and redistribute the material in any medium or format – and Adapt the content - remix, transform, and build upon the material for any purpose, even commercially under the following terms:

Attribution: You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

[CC BY 4.0 license terms summary](#) [CC BY 4.0 license terms](#)