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RISK FACTORS IN VETERAN TABLE TENNIS PLAYERS

Abstract

Like other physical activities such as walking, running, swimming or cycling, table tennis can be practiced from childhood to old age. In general being physically active when getting older has different positive effects. For example and by comparison with sedentary people of the same age, the regular practice of table tennis slows down the unavoidable decrease in muscle mass, especially in legs, and maintains the aerobic capacity at higher values than in sedentary people. It is well known that playing table tennis after 50 years can help to keep balance, skill and reflexes at a good level, and it has also a positive influence on some brain functions and mood. However it must also be kept in mind that the ageing process is characterised by a more or less pronounced reduction in physical and mental abilities, even in the most physically active people. Therefore the risk of illness or injury increases as the body resistance declines, and some accidents can have a tragic outcome as far as the cardiovascular system is concerned.

In order to have a better knowledge of the specific injuries associated to table tennis in veteran players, all the insurance claim reports issued in France and concerning the table tennis players whose age was equal to or above 40 years have been collected over a period of 4 years. Among the 165 injuries reported, 146 were traumatic injuries, and 19 were cardiovascular events of which 16 lead to the death of the player in a few minutes. All the fatal cardiovascular events occurred in competition except one during a training session.

An adapted practice of table tennis by veteran players may contribute to delay and to momentarily soften the negative effects of the ageing process. However since there is no possibility to totally avoid some of these negative effects, veteran players are strongly encouraged to have a regular activity of moderate level without fighting spirit, and to periodically undergo a medical examination preferably made by a physician who is aware of the loads and constraints linked to table tennis, and particularly with regard to the cardiovascular aspects.

Key-words: *veteran players - risk factors - injuries - cardiovascular events - prevention*

Introduction

Like other physical activities such as walking, running, swimming or cycling, table tennis can be practiced from childhood to old age. In general, being physically active when getting older brings different positive effects (Marks, 2006). For example and by comparison with sedentary people of the same age, the regular practice of table tennis slows down the unavoidable decrease in muscle mass, especially in legs, and maintains the aerobic capacity at higher values than in sedentary people. It is well known that playing table tennis after 50 years can help to keep balance, skill and reflexes at a good level, and it has also a positive influence on some brain functions and mood. Since the second half of the past century, there is a real incitation based on scientific works and medical recommendations which underline the positive effects on health of a regular physical activity during the whole life as opposed to the negative effects of a settled way of life (Paffenberger et al., 1986). At the same time, it seems that the significant increase in mean life expectancy mainly observed in industrialised countries, combined to an increasing leisure time and / or a relative decrease in working time, constitute favourable circumstances to start or to continue a sporting activity well beyond the age of 50 years.

However it must also be kept in mind that the ageing process is characterised by a more or less pronounced but unavoidable reduction in physical and mental abilities, even in the most physically active people. Therefore the risk of illness or injury increases as

the body resistance declines and also as the intensity of the practice increases. The notion of risk is present in any sporting activities, including in racket sports, and some accidents can have a tragic outcome as far as the cardiovascular system is concerned. Most of the time, practically all the injuries and serious accidents are linked to the presence of identified and well known risk factors which have been neglected or underestimated. It means that most of these accidents could be avoided if the concerned players accepted to follow some preventive measures.

When searching into the literature it appears that some works have already been published about the pathologies connected to the racket sports, but practically all the publications deal only with traumatic injuries, i.e. bone, joint, ligament and muscle injuries (Kibler and Chandler, 1994; Petschnig et al., 1997; Pluim, 2004). Moreover nearly all studies have been conducted in young and / or elite players. Concerning table tennis, to our knowledge no study has ever been conducted to make an inventory of the most common injuries affecting competitive players above 40 years of age (veterans) and including cardiovascular events. Some data of the present article have been presented during the 4th World Congress on Science and Racket Sports (Kahn and Charland, in press).

Materials and method

In order to better know the type and frequency of injuries and accidents occurring in veterans while playing table tennis, all the insurance claim reports issued in France have been collected over a period of 4 years from 8th January 2003 to 14th January 2007. Only the reports of injuries having occurred on the site of the practice (inside the table tennis hall), and having necessitated a medical care have been taken into consideration. Since a specific insurance contract is systematically attached to the playing licence of each registered player of the French Table Tennis Association (FTTA), it is assumed that practically all injuries and accidents have been reported to the insurance company.

Results

During the 4 years period 165 insurance claim reports concerning players aged of at least 40 years (50.6 ± 9.1 years, $M \pm SD$) have been received by the insurance company working with the FTTA. The reports concerned 14 women (7.3 %) aged of 49.8 ± 9.6 years, and 151 men (92.7 %) aged of 50.6 ± 9.1 years. The distribution of the reports collected in veteran players according to their age category and gender is shown in table I.

Table 1 *distribution of the claim reports according to age group and gender*

	N	%	Male / Female
V1 (40 – 49 yr)	102	61.8	M = 103 F = 9
V2 (50 – 59 yr)	34	20.6	M = 32 F = 2
V3 (60 – 69 yr)	23	14.0	M = 20 F = 3
V4 (70 – 79 yr)	6	3.6	M = 6 F = 0
Total	165	100	M = 151 F = 14

Among the 165 injuries, 146 (88.5 %) were traumatic injuries (Table II): the most frequent were joint and bone injuries (38.8 %) mainly represented by ankle and knee sprains (25.5 %) and fractures (13.3 %).

Table 2 evolution of the type of injury as the age is increasing

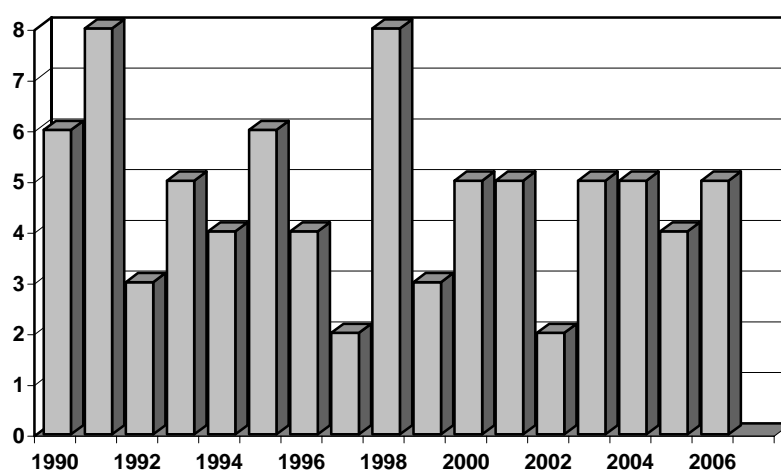
	N	(%)	Age (years) M±SD
Tennis leg	28	(17.0)	46.2 ± 4.7
Joints	42	(25.5)	47.0 ± 6.9
Rupture of Achilles tendon	33	(20.0)	51.1 ± 6.8
Fractures	22	(13.3)	53.2 ± 11.4
Miscellaneous	21	(12.7)	53.3 ± 11.5
Cardiovascular events	19	(11.5)	57.9 ± 9.5
Total	165	(100)	50.6 ± 9.1

The second largest number of cases (37.0 %) concerned muscles and tendons. The rupture of Achilles tendon represented 20.0 % of all injuries reported; among them, only 1 occurred in a woman. There was also 1 rupture of the patellar tendon. Concerning muscle injuries (17.0 %), there were 23 partial ruptures of the gastrocnemius muscle ("tennis leg") of which 1 in a female player, 3 partial ruptures of the tight posterior muscles, and 2 partial ruptures of the biceps brachii muscle.

In the group "miscellaneous" (12.7 %) there were mainly losses of balance and / or falls: 3 falls were without serious outcome, there were 2 short losses of consciousness, 1 cranial traumatism, and a dozen of minor injuries (bumps against the table or with a racket, etc.)

The remaining cases (11.5 %) constituted the smallest group of accidents but it was also the most serious as it concerned 19 cardiovascular events (57.9 ± 9.5 years of age). In fact 16 of them (9.7 % of all reported injuries) lead to the death of the player (mean age: 59.5 ± 9.2 years) in a few minutes. All the fatal cardiovascular events occurred in men and in competition except one during a training session. This corresponds to a frequency of 4 deaths per year. More data on fatal cardiovascular events in veteran table tennis players have been collected in France during a period of 17 years from 1990 to 2006. During such a long period of time, the mean frequency of occurrence was 4.7 ± 1.7 deaths per year (range: 2 – 8) at a mean age of 53.0 ± 6.9 years (Fig.1).

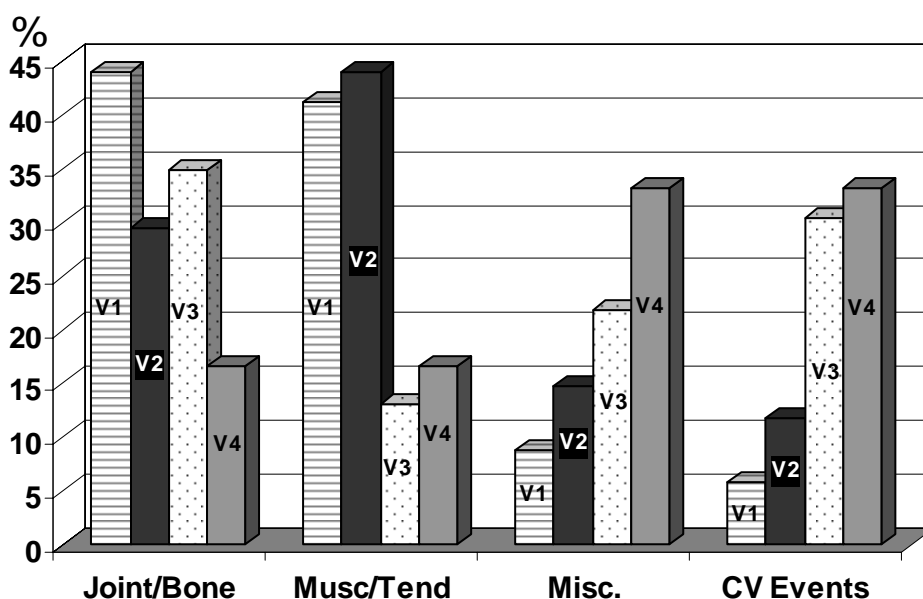
Figure 1 number of fatal events in veteran table tennis players from 1990 to 2006



Discussion

Despite its appearance of simplicity and innocuousness (no direct contact with the opponent, light racket and very light ball), table tennis activity is subject to the occurrence of more or less serious injuries, in particular in older players as the risk of injury by falling down and/or of cardiovascular event increases with age (Fig.2).

Figure 2 *distribution in relative values (%) of the different types of injury in each age group*



In the French TTA, the players (males and females) aged of 40 years and above roughly represent 20 % of all registered players having a licence, whereas the total of injuries and accidents reported to the insurance company represented around 30 % of all the claim reports received. These figures clearly indicate that the older players are more at risk than their younger counterparts, and that preventive measures need to be developed.

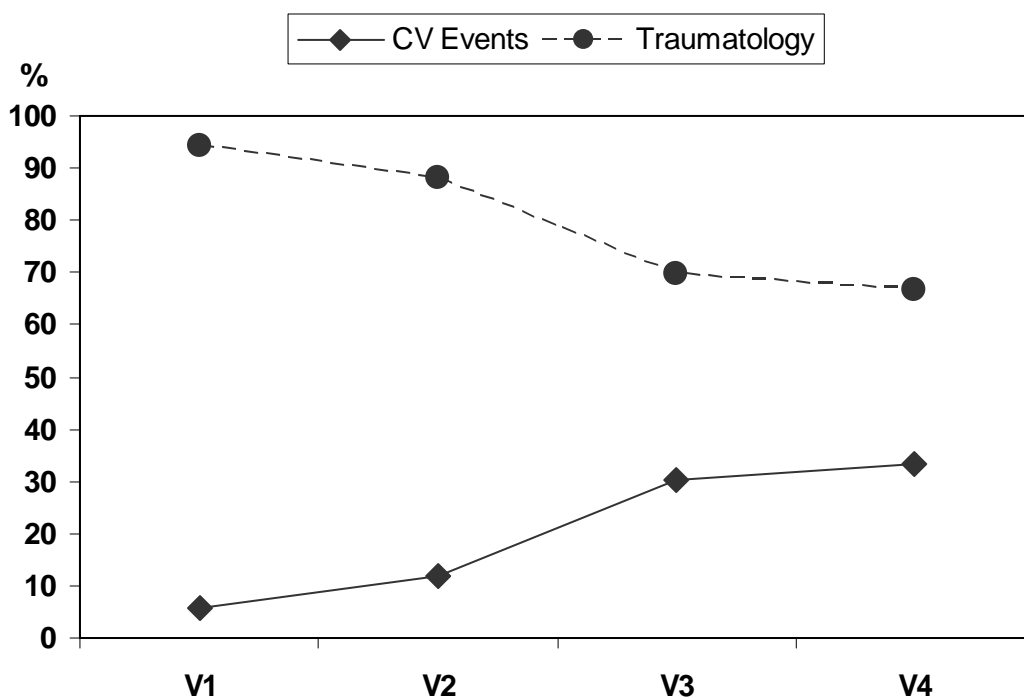
Considering the frequency of occurrence, the first category of injuries related to joints and bones (38.8 % of all injuries), such as ankle sprains or serious knee sprains, and different types of fracture (metatarsal bones, legs, wrists, teeth, etc.). The mean age of the players concerned was 49.1 ± 9.1 years which corresponds to the “young” veterans (V1). This finding is not surprising since ankle and knee sprains are also the most frequent injuries encountered in table tennis players under 40. It seems that this age group has some difficulty to accept that they are getting older and that their physical capacities have already begun to progressively decrease since several years. In particular there is a small but constant decrease in muscle mass and force, and the central and peripheral nervous system is getting less efficient in controlling fast displacements (lesser coordination efficiency and balance) whereas most of the players of this age group continue to play as if they were 10 or 15 years younger. Moreover, besides the decrease in muscle mass, there is also a progressive decline in bone density and mass of about 0.10 to 0.15 % per year until the age of 50 years. Beyond 50 years the reduction in bone mass is even deeper especially in postmenopausal women. Therefore the induction of bone fragility as people get older combined to some muscle weakness, especially in the lower limbs, easily explains the high frequency of fractures (13.3 % of all injuries) and sprains (25.5 %) in a sporting activity like table tennis where displacements are frequent, sudden and in all directions.

The second largest category of injuries concerned muscles themselves and tendons (37.0 % of all injuries). Not only there is a reduction in muscle mass and force with age, as already mentioned, but there is also a decrease in muscle and tendon elasticity and an increased stiffness, and the couple “muscle + tendon” becomes more and more fragile. The increased muscle stiffness associated to a poorer motor control and a high muscular load (“I want to win that point!”) constituted a strong risk of a total or partial rupture of

either the gastrocnemius muscle (17.0 %) or the Achilles tendon (20.0 %) at the initiation of a sudden and strong muscle contraction.

It is clear that the most serious accidents were represented by the cardiovascular events, especially when the death occurred in a few minutes, which was the case 16 times out of 19 in 4 years. The 3 survivors were veteran players belonging to V1 and V2 groups (2 and 1 respectively). It means that in V3 and V4 groups, all cardiovascular events were fatal. When comparing the distribution of injuries (in relative values) in players according to their age group, it appears that the occurrence of a fatal cardiovascular event was 5 times as high in players above 60 than in players under 50 (Fig. 3).

Figure 3 among the injured players, the relative risk of occurrence of a cardiovascular event increases with age, whereas the relative risk of a traumatic injury tends to decrease



In principle all the players underwent a medical examination at least once a year as they need to obtain a medical certificate to be allowed to play in competition. Even if after a cardiovascular event it is very difficult to get detailed information about the medical history and profile of the victim, it seems obvious that in practically all cases, the player didn't follow the recommendations made by his doctor, and / or neglected some warning symptoms and went beyond his limits while playing. Some of these limits are fixed by the decrease in heart performances with increasing age. For example the maximal heart rate which is about 180 beats per minute (bpm) at 40, is reduced to 150 bpm at 70 years of age. In the same way, all the arteries become more rigid with age which results in an increased resistance to the blood flow, thus the oxygenation of all muscles, including heart, is reduced especially during exercise. Besides age, in sportmen the cardiovascular system is exposed to several other identified risk factors. These are gender (in general men are at higher risk than women), personal and / or family history of cardiovascular diseases, elevated levels of serum lipids (cholesterol, triglycerides), hypertension, diabetes, overweight, tobacco smoking. All the above risk factors contribute to decrease the inner diameter of the arteries which conduct the blood flow to the brain, heart and muscles. Age and gender are inherited and can't be modified, as well as the family history. On the other hand all the remaining factors can (should) be controlled through a balanced lifestyle and diet (MacLaren, 1998), and the maintenance of a good physical condition during the whole life. Table tennis is characterised by a

succession of short and intense periods of activity separated by incomplete recovery which represent an important load for the heart. For this reason veteran players are recommended to spend some time to maintain their endurance abilities through walking, running or cycling. Similarly in order to prevent the decrease in legs and back muscle mass and force, veteran players must be encouraged to regularly make adapted strength training.

In conclusion, like any other sporting activities, table tennis has some risks. At the difference of most other sports, table tennis can be played up to an advanced age. Now the number of risk factors increases with age. In the first age groups (V1 and V2) the risk factors were mainly represented by a progressive decrease in muscle and nervous system capacities together with a decrease in bone density. In these conditions the most frequent injuries were ankle and knee sprains, tennis-leg and rupture of Achilles tendon, and fractures. Above 50-60 years of age, the same risk factors were still present, and were accompanied by cardiovascular risk factors, mainly in male players. In order to detect and to limit the impact of all the risk factors appearing with ageing, every veteran table tennis player should undergo a regular and systematic assessment of his health statute and physical abilities during a medical examination carried out at least once every year. If an abnormality is detected, everything must be undertaken to explore it with the right means and to treat it with the appropriate drug(s), and when necessary the patient must be encouraged to modify his way of life (to lose weight, to stop smoking, etc.). Physical activities must be regular and of moderate intensity.

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