International Scientific Congress Applied to Table Tennis

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In 1989, the recently elected ITTF President Ichiro Ogimura decided to create a new committee (the Sports Science Committee) and suggested to regularly organize scientific congresses. The aim was to give to all people involved in table tennis research an opportunity to meet at least once every two years, and to exchange ideas and results obtained in different fields such as technics, materials, training, medicine, psychology, biomechanics, physiology, etc.

Mr. Ogimura was convinced that table tennis development in the world should be closely connected to a more scientific approach of its components. At that time, he had to face different problems (e.g. the glue toxicity, how to make table tennis more visible to spectators and media, etc.) and he always asked experts to conduct experiments before proposing an adapted solution. Very often the experts come from different ITTF committees: equipment committee, athlete's commission, rules committee, sports science committee, etc.

The first ITTF sports science congress took place from 23 to 27 March, 1989, in Rome, Italy, a few weeks after the world championships held in Dortmund, Germany, and it was attended by 27 participants from 13 countries. Then it was decided that the Congress would be held every two years at the occasion and in the country of the world championships, which is the more convenient period to gather many participants.

The second congress was organized by Prof. Nobuo Yuza and the Saitama Institute of Technology from 21 to 23 April, 1991, in Fukaya, Japan, a city located at 70 km from Tokyo and Chiba. More than 60 people were present.

In 1993, the 3rd congress was held from 7 to 10 May in Falkenberg, Sweden, just before the world championships in Gothenburg. Then the 4th congress took place in Beijing, China, from 27 to 30 April, 1995, before the 43rd WTTC in Tianjin.

In 1997, for the first time a joint congress has been organized with the world commission of sports science (racket sports) : the 5th ITTF sports science congress and the 2nd world congress of science and racket sports. This very interesting congress,

attended by 60 people, took place from 22 to 25 April, 1997, in Lilleshall National Sports Centre, England, not far from Manchester.

In 1999, the 6th congress had been planned from 22 to 25 April in Arandjelovac, Yugoslavia. Unfortunately, because of the war both the congress and the world table tennis championships were postponed. Finally, the congress has been successfully organized in a very short period of time by the Malaysian TTA on 18 and 19 February, 2000, in Kuala Lumpur, Malaysia, in the presence of YB Datuk Ong Tee Keat, Deputy Minister of youth and sports, Mr. Adham Sharara, the new ITTF President, and 60 delegates.

The following year, the 7th congress was held from 21 to 23 April, 2001, in Osaka, Japan, thanks to the great work accomplished again by Prof. N. Yuza and the JTTA Sports science committee. Unfortunately, a few days before the congress, Prof. Yuza suddenly fell ill and could not participate to the congress. Among others, several presentations dealt with the new 40 mm ball, and with table tennis played by disabled people.

In 2003, I organized the congress from 17 to 19 May, at the national institute of sport and physical education (INSEP) in Paris, France, again in close collaboration with the world commission of sports science (Prof. Adrian Lees, Liverpool, UK), so that we had a joint congress devoted to several racket sports (table tennis, tennis, squash, badminton, cricket, pelota): the 8th ITTF sports science congress and the 3rd world congress on racket sports. More than 150 people coming from 24 countries participated in.

It is foreseen that the 9th congress be organized in 2005 in China. All the works presented during the first 7 congresses have been published in the **International Journal of Table Tennis Sciences No 1, 2 and 3** (congresses 1 to 4), and in books **Science and racket sports II**, published by E & FN Spon, 11 New Fetter Lane, London EC4P 4EE, UK (congress 5), **Table tennis sciences**, **No 4 and 5**, published by the ITTF (congress 6 and 7) (sold out) and the papers presented during the 8th congress will appear in the book **Science and racket sports III**, which will be published in 2004.

The abstracts of the works presented in Osaka (2001) and Paris (2003) can be found on the ITTF web site **www.ittf.com** .

OPENING CONFERENCE: "THE DEVELOPMENT OF SOCIAL SPORT POLITICS IN CHILE"

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The enactment of the Sport Law Nº 19.712 in January of 2001, and the launching of the National Politics of Physical Activity and Sports, July 2002, constitutes the tools that form the legal framework as well as the strategic way to follow in order to solve the great problems of our country:

- Firstly, it has to do with the sedentary state of our population and its consequences have marked the path of new dominant diseases of the XXI century.

- Secondly, it has to do with the quality deserved by the sport of international representation and the image reflected by the respective country.

- Thirdly, it is a big problem, that is to say the effect of the previous two problems, which the low sport culture level of the country.

The conference is about how the Sport Force of the country is built, the kind of force produced, the order of the building up, how it is built, and it points out the basis of this construction.

Therefore, the conference presents the concept of strategic path, the sport force of the country, kind of forces, how they are built, and the order of construction and the basis of all. This issue defines the problems to be considered by the Sport sciences in supporting each of the components of this sport force from the Technical – Methodological and Scientific viewpoint. It defines also the problems to be solved on each of the sport areas belonging to the structure of the Division of Physical sciences and Sports of Chiledeportes in order to find a solution for the three great problems stated.

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HISTORICAL EVOLUTION OF THE TABLE TENNIS INJURY

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ABSTRACT

The Table tennis injuries, constitute a challenge for the exact management, due to the diversity of predisposing and causative factors. Is a compatible discipline with all the age groups and it is an activity of low impact. The tendency to the chronic of the injuries is high and the medical attention as for the prevention, diagnostic and processing of the injuries produced in the table tennis is incipient. The aid programs need to establish among the medical and technical team.

Table tennis is a discipline that causes great expectations among the general public, perhaps due to the speed reached by the ball and for the player's capacity to react.

Materials and Methods

The study was made with 164 table tennis athletes from both sexes. A personal survey including the following points was made to arrange the data: name of the athlete, age, sex, weight, height, domain, and practice time of table tennis, frequency of practice, habits, pathological personal precedents, sport injures suffered, date, treatment done and progress of the same.

Discussion

In the interpretation of the results produced, we found the predominance (79,27%) of the table tennis population that the ages 16-30 correspond to the period of greatest physical activity. With respect to the weight of the athletes, we did no found a direct link in the cases of related to spine, knees, and ankle injuries. The results show that 77, 43% of the injuries were suffered by the athletes whose weight was between the ranges 50-80 kg. We would attempt to state that table tennis correspond to an activity of low impact and that the responsible factor of the injuries are the biomechanics disorder derived from the complexity of the movements done during the performance.

In another case, 77, 61% of the cases correspond to 1-15 years of practice in table tennis. The group with more that 16 years of practice in table tennis, we observed an increasing in the cases of "fascitis plantar", we could relate this finding with degenerative aspects of skeleton muscles, inadequate use of shoes, permanence on inadequate playing surfaces, among other causes of injuries.

It calls my attention that in evaluating the progress of the different injuries presented in this study, an important chronic tendency was observed.

From the beginning, there was a group of athletes who did not receive any kind of treatment, however 68% still fell the symptoms of such injuries.

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Conclusions

1. - Table tennis is a sport discipline compatible with “etarios” groups, presenting an active remaining of high average in comparison with other sport disciplines.
2. - Table tennis is a sport discipline of low impact that presents a variety of important injuries.
3. – The appropriate equipment, especially shoes and floor surface have a determining influence over the appearance of new injures in members of the body like feet and spine.
4. – The injuries presented in the study are very varied with respect to the production mechanism.
5. – The overuse and the incomplete physical preparation before the sport activity are important factors in the etiology of the most frequent injuries of table tennis.
6. - The tendency to injuries to be chronic is high in table tennis, that is why there must be a greater input of medical aid to prevent symptomatology of any location and intensity.
7. – Medical aid in prevention, diagnosis and treatment of injures caused be table tennis is incipient.
8. – There is a need to establish assistance programs between the medical and trainer teams in order to design strategies that would detect, follow and manage injuries belonging to this sport activity.

RECOVERY IN TABLE TENNIS

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ABSTRACT

After a training session or a competition, recovery corresponds to a period of activity which can be either reduced, or nil, or different, for a period of time long enough to make the athlete able to repeat, and even to improve, the previous performance. Recovery can be passive (rest) or active, and it is the only means to assimilate the learning and training processes, and to restore the players' capacities in the fields of biology, metabolism (nutrition and hydration), psychology (motivation, concentration), and it should be combined with a healthy life style (personal hygiene, sleep, etc.)

INTRODUCTION

Generally speaking, after a period of training or a competition, recovery corresponds to a period of activity which can be either reduced, or nil, or different, for a

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period of time long enough to allow the athlete being in a state to repeat, and even to improve, the previous performance.

After a competition, the notion of recovery is closely linked to the notion of fatigue, whereas after a training session recovery may be linked either to the appearance of fatigue, or to a process of learning delayed integration, or to both of them.

In all cases, the absence of recovery or an inadequate recovery permit fatigue to develop on a long term basis, and it may lead to an overtraining syndrome, which constitutes a real pathological state.

Like for training with a view of achieving a performance, recovery depends on several factors linked to the athlete himself, to his environment, and to the nature of the sport. In table tennis, as well as in other racket sports (tennis, squash, badminton), the management of recovery during and after training sessions should not pose particular problems as far as the number and the schedule of the sessions, their content, the intensity and the length of exercises are planned with regard to clearly defined objectives. On the other hand, the management of recovery may be much more complicated during a competition period because of the great number of existing playing formats whatever the playing level. According to the circumstances, a player can be engaged either in an individual or in a team event; the length of the competition may vary from a few hours to several days (at international level, some competitions are spread over 8 days (world championships) and even 10 days (Olympic Games)), and during a single day a player may be brought to play up to 4 or 5 matches, and sometimes even more in some tournaments. Besides, the duration of a match is extremely variable, depending on the number of games and points played. Therefore, in order to manage his recovery in the best possible way during a competition, the player must take into account the type of playing system used in order to take advantage of any playing interruption, including between two points. Of course, the latter situation is feasible only if the player has already practiced it during training.

Therefore, the objectives aimed at and the means implemented must be really suited to each situation in order to obtain either a partial recovery or a complete recovery.

- Biological recovery : physical activity induces biological changes with respect to resting state. In normal practicing conditions, such changes represent a positive adaptation of the whole body. Some changes arise instantaneously as soon as the activity begins,

then they disappear when the activity ends (e.g. the increase and the decrease of heart rate), some others are more lasting (several hours or days) and are still present after the end of the physical activity (e.g. the blood concentration of some substances, the level of heart rate at rest), and their changes (either an increase or a decrease) beyond certain limits may announce the onset of fatigue.

- Nutritional recovery : its purpose is to restore the metabolic balance inside the body during or after a physical activity which lead to a marked decrease of the energy stores (e.g. glycogen), electrolytes and water, and which produced large amounts of organic byproducts whose trend is to accumulate and to disturb the neuromuscular functioning (e.g. lactate, ammonium).
- Psychological recovery : aims at managing the anxious tension or stress during the competition, or the excitement state (sometimes the dejection state) following the competition.
- Muscular and locomotor recovery in order to compensate for the joints overloading due to physical activity.

At present, athletes have a great number of recovery means at their disposal. Among them, the planned reduction of the activity (intensity, length) or the controlled practising of another (different) activity, and sometimes the complete rest, represent the main components for an actual recovery. They must be combined with a healthy life style particularly focusing on a well balanced and adapted diet, and on a sleep of good quality. These basic and natural means can profitably be complemented by using (under the supervision of capable people) different techniques in psychology (muscular relaxation, Schultz autogenic training, sophrology, etc.), manual techniques (massage, osteopathy, etc.), and physical agents (hydrotherapy, cold, heat, electrostimulation, vibration, etc.)

It is only when the capacity of adaptation to exercise and / or the capacity of recovery are overtaken, despite the use of appropriate means and for a long enough period of time, that specific medicines must be prescribed to avoid the development of an overtraining syndrome or to treat a concomitant disease (e.g. a viral infection).

THE ATHLETE´S TRIAD

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ABSTRACT

The athlete triad is a combination of three conditions: eating disorders (anorexia nervosa), amenorrhea and osteoporosis. Some symptoms and signs of this disorder are: weight loss, absence of periods or irregular periods, fatigue and decreased ability to concentrate, stress fractures and muscle injuries. Parents trainers and partners should help to recognize it. THE BEST TREATMENT IS PREVENTION.

The athlete's triad is constituted by: ANOREXIA, AMENORRHEA AND OSTEOPOROSIS.

ANOREXIA:

Anorexia, or decrease in appetite, is a symptom that can have two great causes: Organic one, caused by some detected illness and the other one is Psychic, behavior disruption due to certain triggering events. This is known as Anorexia Nervosa. Eating disorders in athletes is one of the studies with a percentage of 15% and 62%, depending on the studied patterns and the sport activity practiced. For instance athletes who are dedicated gymnastic, skate rolling, synchronized swimming tend to suffer the illness.

With respect to racquet sport, especially table tennis, in which movement is a crucial part of the practice, and therefore it demands an appropriate weight. Together with the high level of stress can facilitate the development of anorexia.

What's more, another fact is that the more frequent players of these activities are young women, most of them without an established personality that may cause fear towards coaches, among others. This particular fear can also trigger the illness.

The most important aspect of knowing the characteristics of the illness is to recognize it, since the first signs are very subtle, and for all that parents, coaches, partners and teachers must be alert of its possible presence.

Among the suggestive signs of its development we can find the concern for food and weight, expressions of complaining about fatness, eating alone often, use of laxative drinks, frequent visits to the bathroom between meals, drink water or soda very often, and doing exercise obsessively.

AMENORRHEA:

Amenorrhea, or absence of menstruation, goes together with the anorexia disruption, being present from the first stages. The frequency of amenorrhea in athletes varies in the different reports in a range from 15% to 66%. The inhibition of haz hipotalamo-hipofisiario, in relation to the hormone FSH (which is in charge of stimulating the maturity of the ovarian follicle) before ovulation is considered as a cause of amenorrhea.

Besides from the alteration of protein synthesis and of fat, the eating of both decreases the synthesis of the hormones in charge of menstruation. In the study of the hormonal component of these athletes, the same are found in low levels, near to those of menopause.

OSTEOPOROSIS:

Osteoporosis as the third component of the triad is very important, due to the fact that it favors the presence of pathological fractures attributed to exercise most of the time, and not to a predisposing cause. The rate of osteoporosis of the athletes is also variable; they present a decreasing of osseous mass in relation to the people of the same age.

The following are symptoms and signs of the athlete's triad:

fatigue, anemia, depression, stress fractures, decreasing of concentration capacity, intolerance to cold, hypothermia, cold and colorless feet and hands, fingers marked by the teeth pressure when vomiting, feet erosion by frequent vomits, abdominal and general pain, constipation, face and extremities edema, photophobia, bradicardia, ortostatica hypotension, chest pain and lanugo.

We should add the supposition, about the disruptions mentioned about anorexia stated to all the symptoms and signs mentioned before, in this way we reach the initial diagnosis of the presence of the triad, which forms part of the medical and psychological necessity for clinics and laboratories, which can help to the conclusion of the diagnosis.

TREATMENT:

In all the cases it must be done with the participation of the psychologist and psychiatrist, the clinic doctor or from sport medicine, nutritionist and sometimes the gynecologist. The most important thing is the reestablishment of the psychic and organic health as a whole in order to solve the problem, which must continue a monitoring treatment to avoid relapses.

Basically, the therapeutic weapons are: appropriate nutrition with overfeeding, reestablishment of vitamins and minerals, hormonal treatment if necessary and psychiatric or psychological treatment of the disorder.

PREVENTION IS THE BEST TREATMENT.

SPORTS PSYCHOLOGY

GENERAL ASPECTS OF ATTENTION AND CONCENTRATION ON TABLE TENNIS: FUNCTIONS, CONDITIONING ELEMENTS, FORMS AND SOME RECOMMENDATIONS FOR ATHLETES' TRAINING

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The study aim to analyze how the attention forms are used in table tennis specific throws. Systematic observations and interviews with fifteen male athletes showed that all sorts of attention forms, as well as problems related to it's functions appear during specific throws. Researchers came to the conclusion that technical and tactical skills demanded by table tennis are closely related to all sorts of attention and that the training process should be concerned with the development of the sensory system qualities.

Although it is not always done in a systematic way during athletes' prepare, psychological aspect is considered relevant among many factors affecting table tennis training programs. However, Sports Psychology has been carrying out tests to analyze athletes' individual behavior, in order to establish the most effective characters or standards that determine the ideal psychological condition to get to extraordinary levels of achievement (high level). When psychological elements related to sports training are observed, we can verify the importance of co-ordinating how often and how strong they are involved and determine a match, and how they are added together in order to reach success according to the specific characteristics of each sport. In this context, mental processes have been taken as essential when it comes to athletes' table tennis training.

If we analyze physical measurements as time, space, speed and acceleration, for instance, and find the relationship between these measurements and some matter's physical and mechanical characteristics, like a table's surface (texture, color, material and height, etc.), the kind of rubber's covering (friction, elasticity, height, surface's type)

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we can observe an extremely complex situation, where the attention to certain stimulus and the player's concentration during a match are essential factors to success.

Besides, some table tennis's specific characteristics, like the fact of the coach's being not allowed to intervene in a contest's sequence during a set, prove that psychological prepare is really important. The lack of communication between coach and athlete during almost the hole match requires the player to be aware of some self-control and self-motivation psychological techniques in order to get an efficient use of his/her total potential. According to Samulski (2002:79), "thinking about irrelevant aspects during a match, like paying attention to the spectators, can take an athletes' rhythm in the match away and disturb his/her tactical behavior". Anyway, sports as table tennis "require the athlete to develop the capacity to keep high concentration levels during long periods of time."

Saying "You must concentrate!" or "Pay attention to the game!" is not enough to have an athlete achieve appropriate attention and concentration levels, though. Concentrate/pay attention to what (which object)? When should he/she concentrate (which is the right moment)? These questions must not concern a player during a competition situation. They have to be part of his/her training process, that should provide the necessary support to enable the athlete to understand attention and concentration processes according to each sport's specific characteristics.

When it comes to table tennis, its absolutely important that the player has enough knowledge of these characteristics and be flexible in order to be able to pay attention to the very relevant stimulus that can be found in the most common competition situations.

Through systematic observations and interviews with fifteen male athletes, this study was developed with the purpose of analyze how the attention forms are used in table tennis specific throws, adopting Nideffer's (1976, 1979) attention bidimensional model as reference. Results has shown that all sorts of attention forms, as well as problems related to it's functions appear during specific throws. Researchers came to the conclusion that technical and tactical skills demanded by table tennis are closely related to all sorts of attention and that the training process should be concerned with the development of the sensory system qualities, in order to find a way to improve aspects related to the reaction time reduction process, so that the athlete's efficiency can be increased and he/she will have better chances to develop his/her tactical intention according to his/her own characteristics, and to each opponent's style.

NON-SYSTEMATIC COPING STRATEGIES IN CRITICAL GAME SITUATIONS IN TABLE TENNIS

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ABSTRACT

Five athletes of the Brazilian women's all-star team, with ages ranging from 16 to 22, took part in the study that aim to identify and describe the non-systematic coping strategies in critical game situations in table-tennis, as well as to analyse their efficiency and the athlete's objective intention when she chooses a certain strategy. The results showed that the main strategies used were motor techniques (67.71%), cognitive techniques (9.53%) and combined techniques (24.76 %). The cognitive techniques showed themselves to be more efficient than the others in relation to success.
UNITERMS: Stress, Coping Strategies, Table Tennis

This study has as its objectives to identify and describe the non-systematic coping strategies in critical game situations in table-tennis, as well as to analyze their efficiency and the athlete's objective intention when she chooses a certain strategy. Five athletes of the Brazilian women's all-star team, with ages ranging from 16 to 22, took part in the study. The data were collected through video filming, questionnaires, observations, quantification of the critical data and the techniques of self-control, besides the use of the self-confrontation method. The main strategies used were motor techniques (67.71%), cognitive techniques (9.53%) and combined techniques (24.76 %). The cognitive techniques showed themselves to be more efficient than the others in relation to success in the dispute for two points after the utilization of this strategy (p=0.04). As for the athletes' objectives with the application of each category of technique, concentration, followed by the application of tactical means and reevaluation, were predominate.

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PSYCHOLOGICAL CHARACTERIZATION OF TABLE TENNIS AND THE INFLUENCE OF THE COMMUNICATIVE WORK OF THE COACH

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The high competitive demand that characterizes table tennis, which is increased by the latest regulating variants, makes essential that the players would receive the necessary elements to help their performance. Among these factors, the mental factor is predominant since table tennis is a sport where the psychic processes are involved in the physical activity in one way or another, in different levels and moments, anytime the player thinks, wants, pays attention, feels, learns and does things. This work aims at establishing the theoretical bases of the psychological work: to characterize psychologically the sport under study by giving, at the same time, the basic directives to the trainers in order to improve their pedagogical resources.

According to the sports classification given by Riera (1985) and Marí (1997), we can consider the table tennis as an individual sport with opposition and without cooperation, and of tactic character, having the following psychological requirements:

Planned Sport: Due to the fact that it is a tactic sport, table tennis is an ongoing process of making decisions that left the tactic role in second place. Consequently, the coach must encourage the reasoned action and make the player take advantage of the moments in which the analysis can be done.

Opposition Sport: Because in table tennis the player faces an opponent directly, and taking into account that there is no possible communication, and ones behavior affects the other, therefore the role of the coach is to observe how the player transmits his/her mental state during the game in order to develop, together with an specialist, a behavioral repertoire adapted to the competition instance.

Autonomy: Because it is an individual sport without cooperation, then the player must make the decisions that would guide his/her actions. In such context the trainer assumes the role of guiding the internal processes of the player by only introducing the necessary modifications.

Auto control: Table tennis is a sport that presents a high level of emotions where to adapt to the situations and the constant changes through auto control is vital. This element makes is a highly situational sport where the coach must increase the control perception over the competitive situation, besides the coach represents a behavioral model.

High Concentration: The accuracy of actions and the specific nature of the stimulus relevant for the ideal performance make necessary that the player focuses on these, avoiding external and internal distractions. In that situation, the coach must guide the attention and avoid generic messages.

Likewise, there are two characteristics of table tennis that include Psychological approach, since they refer to the psychomotor development: the multiple coordination and the high speed of reaction: in table tennis the body is taken as a whole and a sum of

different segments that should have a high rate of adaptation in a changing environment. Both aspects must be considered by means of a work adapted to the period of personal psychomotor development of the player, and also highlighting the cognitive understanding of his/her personal actions.

Finally, it is worth saying that in the psychological perspective is vital that the player trains his/her mental skills in order to perform appropriately during the resting time, which it is a time where there is no training, but that it plays a fundamental role on the final result.

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EVALUATION OF STRATEGY´S EFECTIVITY TO DECREASE PRE-COMPETITION ANXIATY IN TABLE TENNIS

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The aim of this study is to evaluate and compare the effectiveness level of training through three strategies to face a decrease level in pre-competition anxiety in table tennis players. The sample was formed by 60 players between the ages 13-18 years old (average: 14.7) with 5 and 36 months of practice in sports (average: 17). This was divided into the following groups: 1) Training in Diaphragm Breathing technique (n = 15); 2) Training with the method of Scanner Relaxation (n = 13); 3) Training with the technique of Auto dialogue (n = 15) and, 4) Control Group (n = 17)

Instruments and variants: Inventory of Anxiety-Feature State (STAI). The control variants were the level of the feature of anxiety, age and practice time.
General Procedure: After evaluating the level of the state of the characteristics of anxiety of the athletes, the experimental groups exercised the techniques during 16 sessions of work, while the control group did not receive any kind of strategy. Then, the levels of anxiety were once again evaluated in order to see the effects of intervening immediately, and then a month after of finishing the last sessions of psychological training.

Results

The analysis of the results obtained showed that there is no meaningful difference between the averages obtained by the work group at the level of pre-competition anxiety before beginning the psychological training ($F(3, 56) = 0.396$; $p=0.757$). After psychological, we could observe that the groups who worked with the technique of Auto dialogue and the diaphragm breathing technique present meaningful differences with respect to the control group ($p=0.000$ and $p=0.001$, respectively) and no differences were observed between the group who worked with the method of Scanner Relaxation and the Control Group.

In what refers to the evaluation of learning permanence, it was found that the average of the groups who worked with the Diaphragm Breathing technique
and the Auto dialogue technique kept their effects ($p=0.001$ for both groups) and that the group who worked with the method of Scanner Relaxation presented insignificant differences in relation to the Control Group.

Interpretation and Discussion of Results

In relation to the immediate effects of psychological training, the fact that only the techniques of Diaphragm Breathing and Auto dialogue demonstrated an impact at the level of anxiety state can be explained for the high similarity, immediacy and applicability of the athletes with these techniques and with respect to the Scanner Relaxation (which had an effect on the anxiety state after a month). Apart from these factors, the results obtained by the group who worked the latter technique could be explained by saying that this group had a lower number of participants that the other groups studied; then, any variant produced on their scores made the average and standard deviation more sensitive to the effect of extreme scores than the other groups.

The results obtained in this study indicate that the treatment of facing strategies constitutes a useful intervention to reduce the levels of pre-competition anxiety immediately or after a month of application.

This work tends to be an invitation to create more procedures which would give a growing support to the sport psichollogy in the context of the demands of the current table tennis, so that any intervention must be made by specialists who will display an appropriate manage of the techniques and their effects on the reaction of a multi and interdisciplinary team.

APPLIED SCIENCIES

BIOMECHANICS
PHYSIOLOGY
PSYCHO-PEDAGOGY

EVALUATION OF THE FORCE OF THE "TREN INFERIOR" WITH A CONTACT PLATFORM IN ELITE FEMALE PLAYERS OF TABLE TENNIS

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ABSTRACT

The objective in mind was to study elite female players of table tennis, the behavior of the force of the "tren inferior", in its explosive and elastic-explosive components, and its importance within this sport. The study was made with 11 players who are part of the Spanish team of National Super division, who present the pre requirement of being qualified within the thirteen best places of the national ranking. We observe in this study significant differences in the behavior of the explosive and elastic-explosive force, an also the elastic rates.

METHOD

For this study, we evaluated 11 players who are of an average age of 25.21±3.5 years, who belong to the teams of the highest Spanish category, National Super division, during the season 2002-2003. After a warm-up of fifteen minutes, all the players were evaluated using the Bosco test (1994). Counter Movement Jump (CMJ) and the Squat Jump (SJ). The best result was considered in both tests in three attempts. The rest intervals between the tests (CMJ and SJ), were made on an active basis within 10 min. from each other. The material in this study was a contact platform, the Ergo tester Globus (Italy) and some register sheets. The graphic treatment was done on the calculation sheet excel V10.2 and the statistical information in the statistical package SPSS V11.0 for windows.

RESULTS

The results obtained in the test CMJ are located in 17.4 and 34.6 cm. With respect of the SJ values, these are located between 13.5 and 37.4 cm. Once the different information of the tests CMJ and SJ are obtained, significant differences in both tests are found between the minimum and maximum results of the players. This are of a 49.61% in CMJ and of 63.90% in SJ. The average results of the flight altitude which were measured in cm were the following: CMJ = 24.27±6.09, SJ = 22.54±7.11. Once the different result were obtained in the test SJ and CMJ, the formula of obtaining the elasticity rate was

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applied ([CMJ-SJ/SJ] x 100) in order to find out the numerical values in the group of the study. The subjects got an average rate of 10.281%±15.831.

DISCUSSION

We have noticed that the players that have the highest elastic rates, and also the best test results CMJ and SJ to obtain an optimal performance in table tennis do not correspond to the best places of the national ranking (not even among the first six), except from one case which indicates the presence of other important factors, besides from the explosive force of the “tren interior”.

A relevant aspect is the results of the test SJ of three players who obtained average values superior to the CMJ test. This can be attributed to the adapted position in most of the technical actions of the leg games, which refer to the movements and position in the table, so that it is necessary to stress the technique from the rest (service reception), called base position (C.O.E. 1991), in which there is an important legs squat (around 90 in the knee articulation) which is maintained during several minutes (isometric contraction).

In this sense, Bosco (2000) states that isometric force levels expressed as a corporal weight are about 30% in females on average, when comparing the averages for independent samples (test T for the equality of averages). We observed a high significant level on the variants, Altitude, Center, and Gravity as for CMJ as SJ (P = 000) and for the variant, elasticity rate (P = 0001). Likewise, we observe an important fact (P = 000) in the correlative analysis made with the variants related to the CMJ and SJ.

For the elasticity rate, we got an average value of 10.28%. There is no a general concordance when defining suitable values of elasticity of a special population. In general, we can say that elasticity should be over 6.9% (Gonzales and Gorostiaga, 2002). This indicates that if we base our assumption on this premise, we can find an acceptable elasticity rate in the players.

CONCLUSIONS

The best results in CMJ and SJ are not meaningfully related to the best places of the qualification. The players who present a defensive game type obtained values superior to the elasticity average, whish are inferior in the CMJ test and very inferior in the SJ test. While the players who develop an attack game obtained superior values to the average test of SJ against the CMJ test, therefore the elasticity rate is inferior. The correct technical positions, like “base position”, can favor getting higher explosive force rates in the test SJ in male subjects.

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APPRECIATION OF THE MAXIMUM MANUAL FORCE ON HIGH RATED ATHLETES OF TABLE TENNIS

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INTRODUCTION

Table tennis is an individual sport, asymmetric, in which a series of hits are received with great speed and force (Faccini et al., 1989). The technical action developed during the game, at the level of the torso and superior extremities are unilateral.

This study aims at searching if there are any differences of maximum meaningful force between the dominant member and the no dominant one of the superior extremities, for male and female players who practices table tennis at a high level. It also aims at analyzing if this is a crucial factor over the performance of the table tennis player.

METHOD

For the study, 25 players were evaluated. They were divided by gender: male (n = 13) and female (n = 12), with an average age of 24.4±5.5 for men, 21.54±3.5 for women, and 23±4.8 years for the whole sample. All the players belong to teams of the 2002/2003 season of the top Spanish category, the National Supervision, except from one of the German Bundelisga. After a brief warm-up and an application of an initial test of the force using a dynamometer, we proceeded with the test. The hand evaluated of the players was chosen at random, in each hand three attempts were done alternatively with each hand. The greater value was registered for a further analysis. The material used was an electronically dynamometer of manual force, model Takei 5102 (Tokyo, Japan), following the standard protocol and a register sheet. The graphic treatment was done in the calculation sheet Excel V10.2 and the statistical package on SPSS V11.0 for Windows.

RESULTS

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In the test of manual dynamometer of pressure in the dominant hand of male players is 45.81kgf, and for women is 29.63kgf, while the values of the no dominant hand are lower in both genders, for men the value was 40.08 kgf, and for women was 25 kgf. A considerable difference of maximum manual force is appreciated in men, who are bigger than women, the dominant member (35.32%) and no dominant (37.62%). The records indicate a slight superiority in the average values of maximum force for the left-handed against the right handed, in both arms. The records for each group are: left-handed and the right handed in their dominant arm respectively 39.17 kgf and 37.68 kgf, and in their no dominant arm 33.08 kgf and 32.76 kgf. A variant in the maximum force of the dominant member form the no dominant member in the male is observed. The value is 87.49%, and for women is 84.37%, for right-handed 86.94%, and for left-handed 84.47%. The data obtained show that the high values of force correspond to the left-handed men on their dominant hand (46.00 kgf). The low values correspond to the right-handed women, 28.72 kgf, on their dominant hand, and 24.00 kgf on their no dominant member. A variant in the maximum force of the dominant member against the no dominant in the sub-group of male is observed, amounting to 88.85%, in the sub-group of left-handed male was of 82.97%, in the sub-group of right-handed female of 83.56%, and for left-handed of 86.60%.

DISCUSSION

According to Hanten et al. (1999), the analysis between the records of right and left hands establishes a meaningful difference in favor of the dominant member against the no dominant one. As this author indicates, if the maximum force of one of the hands is already known, the other value could be estimated as a variation of 87%. The results obtained in this study are similar to the percentages established by Hanten et al, which verifies variants in the male of 87.49%, and female of 84.37%, right-handed people of 86.94%, left-handed people of 84.47%. The sub-group of left-handed presents greater force in the dominant arm (left one), and no dominant (right one), with a 82.97%. We found a favorable superiority of the force record for the male against female for both members. The dominant member of the female player represents a 64.38% of the force given by the players, and no dominant of a 62.38%. When establishing between the right-handed and the left-handed teams, some values are observed record values higher for the left-handed groups in both members. The left-handed have a surplus of 3.78% against the right-handed in the dominant group, and a 0.97% in the no dominant. The average age of the left-handed was 25.83 years old, and for the right-handed were 22.11. While for the male, players with high records of force, the average age was 27±65, which were the older of the group, while for the girls with high records, the average age was 20.6±3.4, who were the younger of the group. Thus, like in the study of Hanten et al., the age had a low correlation.

CONCLUSION

The manual high force is bigger in the dominant member against the no dominant one, as well as for left-handed and right-handed players. Once the maximum force of the dominant member is known, the no dominant one can be then know, with an explanation in the variation of 85-87%. The difference obtained between dominant and no dominant member could be associated to the development of “escoliósticas” attitudes, which have

harmful consequences for health. The maximum manual force is superior in the male over the female. The left-handed players have marked a slight record of higher forcer than the right-handed one. It can be typical characteristics of table tennis and other asymmetric sports that must be verified in further studies.

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BIOMECHANICS VIEWPOINT OF THE SERVICE IN TABLE TENNIS UNDER THE NEW REGULATION

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ABSTRACT

The Biomechanics of the service in the Tennis of Table establishes that this action is produced by a combination of forces: Internal, understood like the muscular force able to produce a change in the different involved biocinemáticas chains in the action due to the organic composition from muscles, the tension of fascias, ligaments and sinews; and External, like the gravity force, the air resistance, the forces exerted in the phase of contact between the ball and the surface of the racket and the forces exerted by the ground on the footwear of the player.

La biomecánica del servicio en el tenis de mesa establece que esta acción es producida por una combinación de fuerzas: interna, extendida como la fuerza muscular capaz de producir un cambio en las diferentes cadenas biocinemáticas en la acción, debido a la composición orgánica de los músculos, la tensión de la fascias, ligamentos y tendones; y externos como la fuerza de gravedad , la resistencia del aire, las fuerzas ejercidas en la fase de contacto entre la superficie de la paleta y las fuerzas ejercidas por el suelo en el calzado del jugador.

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The Biomechanics is a scientific discipline studies the movements done by humans when exercising a sport. It analysis the motor actions of the players as active systems mutually related. In that analysis the mechanical and biological causes of movements are investigated as well as the characteristics of the motor actions depending on them under different conditions.

For that reason it is necessary to determine the effectiveness of forms of performance of actions under study, then it is significant to know the factors that determine the effectiveness of the action, the conditions under which it is produced, and how such motor action is better performed, taking into account kinetics and cinematic variants.

When considering the service from the mechanic point of view, this is took as a complex action due to the complexity in its mechanics. The Biomechanics of service in table tennis establishes that this action is produced by a combination of forces: Internal, understood like the muscular force able to produce a change in the different involved biocinematicas chains in the action due to the organic composition from muscles, the tension of fascias, ligaments and sinews; and External, like the gravity force, the air resistance, the forces exerted in the phase of contact between the ball and the surface of the racquet and the forces exerted by the ground on the footwear of the player.

Although it is true that the service execution demands the coordinated action of the whole body, for the biomechanics analysis it is suitable to separate the whole in parts and phases, in order to study the service schematically as a continuous and coordinated series of movements that can be divided into phases and periods: presentation, preparation, contact and establishment.

It is important to say that from the biomechanics viewpoint the variant of quantity of energy permits the energy transfer from one body to another; in this case it is presented between the racquet and the ball in the instance of contact.

In consideration that the main aim of the new regulation is that the service technique will be always completely visible for the receptor and the coaches. A regulation have been enacted, which prevents touching any part of the body between the receptor and the body, which decreases the movements quantity by using less body mass in the instance of contact between the ball and the racquet and at the same time it also prevents to advantage when allowing the permanent vision of the ball from the beginning of the service till the instance of contact between the ball and the racquet, this action makes difficult to cheat the receptor.

As a conclusion, the new regulation enacted for the service has a decreasing of the offensive level from the receptor side, which also decrease the difference between the players since it prevent that the server would be able to take advantage from the service as a consequence of his/her skill in this play.

More actions will be made with the backhand in order to avoid putting any corporal segment between the ball and the receptor and the services would shorter in order to make uncomfortable the returning as much as it can, by preventing the action of angular path of the segment involved in the receptor’s action.

The possibility to increase the quantity of movement by the intervention of corporal mass is decreased and this is to be compensating by increasing the speed of the racquet in the instance of contact.

The aim to make the sport more competitive and therefore it became more attractive to the spectator, which helps to the validity of this sport in the different stages to be performed.

INTERMITTENT HYPOBARIC HYPOXIA : AN ALTERNATIVE METHOD TO IMPROVE ACCLIMATIZATION AND THE PERFORMANCE IN ALTITUDE

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ABSTRACT

Thirty one young athletes were exposed to intermittent hypobaric hypoxia, one month before the Juegos Trasandinos de la Juventud, 2001. At the beginning and of study, changes in hemoglobin levels were measured a physical fitness test in Hypobaric Chamber at 4500 m, and 12-min test field test at sea level. An increase in hemoglobin was observed in both sexes. All subjects showed an improvement in Hb % saturation, double cardiac product and rating of perceived exertion. Distance in 12-min increased also in both sexes.

Thirty tour young players (table tennis: 5; swimming: 10; judo: 19) between 14-18 years, were exposed to a training of intermittent hypobaric hypoxia to promote the acclimatization to altitude, to stimulate the eritropoyesis and to improve the aerobic capacity. The training was done in hypobaric chamber, one month before going to Bolivia, in Oruro at 3.700 m and Potosi at 4.100m in the context of the trans-Andean Junior Games 2001. The parents signed a paper and were informed of the recommendations of the Declaration of Helsinski; they allowed the participation of the players in the study.
Blood samples were taken to have a profile hematologico basal; anthropometric measures of weight were made, size and fat (%), an estimation of the aerobic capacity at sea level in a test of 12 min and a test of tolerance to altitude of 4.500 m in Hypobaric Chamber, which was about pedaling on cycloergometer with progressive loads of 25 W till an intensity of 70% of the cardiac frequency of reserve. Later, they were exposed to the intermittent hypobaric hypoxia, 2-3 h every day, 3 times a week during 4 weeks, with progressive altitude in stages from 3.000 m to 4.500 m; 500 m were increased every two weeks; on every climbing each player pedaled on an ergometric bicycle for 30 min with a 70% of cardiac frequency of reserve and they also did technical skills in order to get used to hypobaric hypoxia.

RESULTS

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From the antropometic point of view, the male group as well as in IMC = 22.6, as in fat % = 16,3 are closer to the demands of this competitive level. The ladies show an IMC = 21,5. but a high fat percentage amounting to 26,5 for this competitive level.
Hematological Effects: The hemoglobin improved in ladies (7.9%) as in boys (3.8%). The ladies began the training presenting slight anemia, by the end it settled to a normal rate.
Effects on aerobic capacity: Physiological Parameters were compared, which were measured in the hypobaric camera at 4.500 m; charges of 50 and 100 watts as a moderated range of aerobic demand.
O2 Saturation: There was a significant improvement of O2 saturation, which can contribute to decrease the symptomns of the mountain disease, and to keep and/or at least to make the low sport performance not so frequent in the altitude.
Consumption of Miocardic Oxygen: The product of the arterial systolic pressure and the cardiac frequency during the exercise express an estimation of the consumption of miocardic oxygen, an important factor of aerobic performance; there was a decrease of the cardiac work with similar charge.
Aerobic capacity estimation: An improvement in the distance done by the ladies was registered (7, 6%) and boys (3.1%).
Mountain disease (3.600 msnm): The arising of the mountain disease (AMD) increased by the second day (one day: 20.7%; two days: 27.5%; three days: 24.2%; four days: 3.4%), according to the score of Lake Louise. By the fourth day a 96.5% was not related to any symptoms of altitude exhibition; it must be considered that all these days were of competition, and the exercise is one of the triggers of the mountain disease, so that the low presence of the mountain disease could be due to a previous acclimatization in the Hipobaric Chamber.

CONCLUSIONS

The intermittent hypobaric hypoxia is an alternative method of exposure to altitude that allows improving the acclimatization and the hemoglobin levels making the O2 transport better; the presence of the mountain disease had a lower frequency than other similar altitude exposures published. Finally, this study was an educative opportunity for the young players to learn how to behave in altitude and what to do, in order the risk of the mountain disease and therefore being more efficient.