185 - MUSCULAR DETRITION AND LEUCOCITOSE IN FUTSAL ATHLETES

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Introduction

The futsal presents a high energy expense as well as a metabolic solicitation and neuromuscular extremely elevated in consequence of the players' intense movement during the departures (CYRINO AND COL. 2002).

The athlete's performance in many sports with ball games where the exercise is intermittent, it is characterized by the ability of the same for performances repeated in exercise, intense as well as its potential for recovery of the effort (KRUSTRUP AND COL. 2003).

The calendar competitive extenuante in the futsal, in if being about sports of high revenue, it commits the destined periods the athlete's real needs for recovery to the stress generated by the training situations or competition (CYRINO AND COL. 2002).

A congested competitive calendar can take the athlete the fatigue, which can result in offenses e/ou fall in the performance during the following period (EKSTRND, WALDÉN AND HÄGGLUND, 2006).

Ehlers, Ball and Liston (2002), they affirm that it is common to occurrence of damage muscular resultant of vigorous exercise, and that for Price and col. (2004) several efforts have been made to prevent and to control offenses as form of assuring the health and the safety in young ball players.

Moreira and col. (2004) they affirm that the futsal is a modality with lesion risk increased due to movement in block that requests sudden acceleration and deceleration with abrupt direction change, what exposes the structures osteomioarticular of its apprentices to great impacts.

In the soccer, the speed of the game has significant relationship with the characteristics of the field as the rigidity, what can induce the discharges rates of offenses when the field is very hard (NORTON, SCHEWERDT AND LANGE, 2001).

The impact that the offenses can have on the professional soccer can be mensurable for the lacks the competitive tests and the consequent cost against the player's wage or the team's performance (PRICE AND COL., 2004).

The evidences show that the exercise as an important effect modulator on the white cells and possibly about the immune function (PEDERSEN AND HOFFMAN-GOETZ, 2000). Alterations in the system immunological when modulated by the physical exercise can be related to the type of practiced modality, volume, intensity, appropriate period of recovery as well as the clinical state and the individual's nutritional.

However, to quantify the great level of exercise stays indefinite (HSU and col. 2002). the exercise extenuante is good as an experimental model for the study of the inflammatory answer and of the septicemia, because they exist evidences that the same could be a method to be used to cause varied and well defined amounts of muscle damage(NATALE and col. 2003). in several subsequent hours in high effort several components of both innate immune system (cells natural killler [NK] and neutrófilos) and the adaptative immune system (function of the cells T and B) they have its suppressed functions (NIEMAN,1997). In contrast with the sharp decrease in the number of cells circulating NK commonly observed after physical exercise, any change in this cellular population was observed in rest after the period of intense physical activity. (MALM, EKBLON and EKBLON, 2004).

The innate Immune system appears to respond differentially to the chronic stress of the intensive exercise with tendency it enhances it of the activity of the cells NK while the neutrophils, is suppressed (NIEMAN and PEDERSEN 1999). Training Loads and excessive competitions can contribute to symptoms of persistent fatigue and appealing infections, but if they are not resolved with appropriate rest, clinical investigations should be accomplished (REID and col. 2004).

The knowledge of the real conditions of the athlete's health through an analysis immunological and as the same has been answering to the physical stress imposed by the training, it can be a thermometer to evaluate and to quantify the stress that this individual supports and the necessary time for recovery. Considering that they are few the studies related to the futsal, mainly in what he/she says respect to an evaluation immunological, this study has for objective to evaluate the answer immunological to the athletes' of futsal of Macaé Sports muscular wastes in the pré-season phase and beginning of the competitive phase.

Materials and Methods

The population of the present study was constituted by 7 individuals of the masculine gender, athletes of professional futsal of Macaé Sports, with age 26.42 6.5 (MEDIUN ± SD, weight 74.07 11.6, Stature 175.7 5.3, IMC 23.86 2.7 and% of fat 10.42 3.3. The participants were informed on the procedures of the experience and the possible disconfort associated to the study to the they sign the consent informed for participation of the research. The athletes didn't introduce any lesion type or disease opportunist. The training was accomplished a week in six days, for 7 weeks, has been concluding 9 hours/week for Technical and tactical Training, 3 hours/week for muscular activity and 3 hours/week for resistance aerobics and anaerobic resistance.

Parameters antropométricos

The participants were submitted firstly to anthropometrics exams accomplished by the technical commission, in which relative data were collected to the protocols of Pollock(1984) for% of fat and Pollock and Wilmore (1993) for circumference measures. For measure of the total weight the scale was used Welmy. The stature was measured through the estandiômetro of the same scale. The cutaneous folds were obtained on the right side of the body and the compasses of fold cutaneous The body Caliper TM was used. The measuring tape was used Sanny for circumference measures.

Blood analysis

The collection of blood was accomplished by the laboratory agreement following the protocols established by the Ministry of Health (2001) and norms of security of the Ministry of Saúde(2004). The athletes met in fast. Blood was collected before the training and it was accomplished in the beginning of the pré-season and beginning of the competitive phase, in which given haematologycals was collected. The participants were well educated to do fast of 12 hours, not to ingest drunk alcoholic in 72 o'clock that preceded the collection, as well as avoiding drunk contends caffeine; to avoid exercises physical intense 24 hours before the collection.

Statistical treatment

With relationship to the statistical treatment to be employee will be used, fundamentally, the methods of the descriptive statistics in the sense of characterizing the universe amostral, and the statistical inferêncial, being used as inference tool, analyze of variance fatorial Anova one way. As complemental test Post-Hoc, the test of Scheffe will be used, through which identifies of way combination and comparative, where they give him, the possible differences manifested by the test of Anova. The level of considered significance will be of p <0,05, that is, 95% of certainty for the affirmative negative and/or that the present study comes to denote.

	Antropometria e Composição Corporal	
Atletas	***PRÉ-TEMPORADA***	***INÍCIO COMPETIÇÃO***
Idade	26 ± 6,5	26 ± 6,5
Peso	74 ± 11,6	73,1 ± 10,2
Estatura	175,7 ± 5,3	175,7 ± 5,3
% GORD	11,6 ± 5,1	9,6 ± 3,9
Peso Magro	61,6 ± 13	62,4 ± 12,7
IMC	23,87 ± 2,7	23,6 ± 2,3

Table 1: Presentation of the referring data the characteristics of the athletes' biotipologia, for the data of age, weight, stature,% of fat, thin weight and IMC, demonstrating it begins of the training period, pré season and final of the period of certain training as I begin of the competition. The data were presented by the average and standard deviation.

	VALORES NORMAIS	**PRÉ-TEMPORADA**	*INÍCIO COMPETIÇÃO*
Leucócitos	4000 - 1000 leuc./ ml	4.886 ± 6,69	5.029 ± 845
Basófilos	0 - 1 %	0 ± 0	0 ± 0
Eosinófilos	2 - 4 %	5,57 ± 1,6	4,57 ± 1,9
Mielócitos	0	0 ± 0	0 ± 0
Metamielócitos	0 - 1 %	0 ± 0	0 ± 0
Bastões	3 - 5 %	1,71 ± 0,48	1 ± 0
Segmentados	51 - 67%	53,57 ± 5,2	57,28 ± 3,1
Linfócitos	21 - 35%	32,71 ± 4,9	31,14 ± 3,7
Monócitos	4 - 8 %	6,42 ± 0,9	6 ± 1,5

Table 2: Presentation of the values of the white cells: Leukocytes, basophils, eosinophils, mielócitos, metamielócitos, neutrophils, band-forms, lymphocytes and monocytes. Demonstrating the values of normalities, the values before the training period and after the training period. The values were presented by the average and standard deviation of the studied group.

This study presents data on the immunological answer of futsal athletes after seven weeks of training that it consisted of technical and tactical training, resistance aerobics and anaerobic resistance and muscular activity works. At the end of the seven weeks, the athletes presented an increase in the contagem of the leukocytes in approximately 3%. The basophils, mielócitos and metamielócitos stayed absent in the pré and post-training. The eosinophils that they came above the strip of normal values that it is going from 2 to 4% in the beginning of the work, at the end of the training they reduced in approximately 18%, even so they still stayed had gone of to reference strip. The same didn't happen with the sticks that came with values below the strip of normal values and to the beginning of the competitions those values reduced more 41,5%. Already segmented them they increased in approximately 7%. there were reduction of the lymphocytes and monocytes respectively in 4,7 and 6,5%.

Discussion

In the period among the presentation of the athletes to the team, training and beginning of the competitions could be observed an increase in the count of the leukocytes in 3% when compared with the values initials. Rebelo and col. (1998) they highlight that exposed soccer athletes to the chronic training can exhibit variations in many immune cells. Corroborating with the presented dice, although not significant, in spite of the short training period the one that the futsal athletes were submitted. The relationship among these studies gives he/she/it for the fact of the modalities present a lot of characteristics in common, that according to Lima, Silva and Souza, (2005) the futsal and the soccer present similar metabolic demands, in spite of the different atmospheres in that are practiced.

The leukocytose happened at the end of the training gave him in function of the relative increase in approximately 7% of the neutrophils. Tidball (2005) affirms that the neutrophils can cause offense muscular in vitro and in I live through the liberation of free radicals and other oxidizers and this process hinders the growth muscular powders offense, though, they have an important paper in the repair process and removal of scars that can impede this growth, although it is not definitive. In study accomplished by Schneider, Fine and Tíidus, (2005) with the objective of relating age and the degree of answer of the leukocytes and muscular recovery in submitted young mices the offense in the muscle flexor to plant through eccentric exercise, they verified that in the period of 1 to 5 days post lesion, there was neutrophiles, infiltration and later on the muscular recovery. Perhaps this recovery for action of the neutrophil is due to liberation of non identified factors that promote the activation and differentiation of the cells satellites (TIDBALL, 2005).

The increase in the count of the neutrophiles in this study suggests that the effects of the exhibition to the stress caused by the training were proportional the happened neutrophilia, that is to say there was not occurrence of inflammatory process for offense and the neutrophils, they contributed to recovery and muscular adaptation to the training. The results of this study corroborate with study accomplished for Malm and col., (2004) where they investigated on the inflammatory process in the human skeletal muscle and epimisium after sharp exercise with plaza eccentric component, which didn't result in inflammation 48:00 post-exercise in spite of the late leukocytose and I increase in the levels of CK and they conclude that the exercise can induce a late leukocytose for activation of inflammatory factors in the epimisium before the exercise. On the other hand, can the regular exercise also generate effect antiinflamatoric through for IL-6 what stimulates the appearance in the circulation of another such anti-inflammatory citocinas as IL-1 and IL-10 it and does it inhibit the production of the citocina próinflamatória TNF -a (PETERSEN AND PEDERSEN, 2005).

For interleucina-6 (IL-6) it is produced for many different cellular types and the skeletal muscle produces and it liberates high amounts of IL-6 during the exercise (PENKOWA AND COL. 2003).

The not segmented neutrophils or band forms to the beginning of the study were below the normal values and at the end of the study they presented a reduction significant of 41,5%. This result doesn't corroborate with the study accomplished by Risoy and col. (2003) that objectified to verify the possible mechanisms behind the occurrence of late granulocytose after exercise of exhaustive endurance and after a test of intense exercise of force where it verified that the band forms presented

significant increase in the recovery revealing a deviation the left and mobilization of the bony medulla. It was not what it happened in this study, what takes to conclude the non significant increase of the leukocytes it was not enough to stimulate the liberation of immature granulocytes in the circulation (RISOY AND COL. 2003)

In what says respect to the lymphocytes, the same ones were reduced in the count differential in 4,5%. there are evidences that changes in the subsets of the lymphocytes induced by the exercise that particularly increase the fraction of the cells NK it is a probable factor that contributes to decrease of the proliferation of the lymphocytes (GREEN, ROWBOTTOM and MACKINNON, 2002).

In response to the exercise, both cellsT CD4+ and CD8+ is mobilized in the blood, but the levels of these cells decline below the values pré-exercise in period powder-exercise (IBFELT and COL. 2002). This lymphocytes reduction can be translated as a negative answer, where it can turn the susceptible athletes to infections. Virus and bacterias win space after the exercise for the window period opened " with alteration of the immunity and the mechanisms are multifatoriais and they include both factors neuroendocrinologics and metabolic. (PEDERSEN AND TOFT, 2000).

The count of the lymphocytes decreases in the recovery process for action of the cortisol that increases elevating PMNs(SHINKAI AND COL. 1996, WEBSTER AND COL.1998, EICHNER,19 99; NIEMAN, 2001). it can be concluded that the levels of high cortisol can have been causing the neutrophylia and reduction of the lymphocites and monocites although this study has not quantified the levels of this hormone.

These alterations happened immunological can be attributed the own overload of the practiced modality, therefore the futsal is a sport that requests potency of the it kicks, agility, speed, acceleration, as well as fast decelerate, displacements varied with direction change, it disputes for the game space, contact physical, high metabolic demand besides a calendar competitive extenuante that contributes to little recovery and a high injuries(RÉ AND COL. 2003; CYRINO AND COL.2002; LIMA, MOREIRA AND COL.2004; SILVA AND SOUZA 2005).

The athletes presented an eosinophils increased that stayed during the work at the end of the study and although it has suffered reduction of 18% under effect of the training, it was still above the reference values. Some hormones and citocines are liberated in the blood current in physical activities and stress situations modulating the cells of the immune system (WEBSTER et al., 2002).

The abrupt eosynopenia can be resulted inside of small amounts of quimiotaxia factors of sharp inflammation of the circulation (BASS AND COL. 1980). The increase of the cortisol rates related to the exercise, as suggested previously, it can be possibly related the reduction to the eosinophils number since they link inversely as increase of the activity of the cortex adrenal. This study presented a reduction in the count of the eosinophils, but eosynophenia didn't arrive, because the values stayed above the reference values. The increased values of eosinophils in the beginning of the study can be related the several causes. Parasitose, allergic illness, reaction drugs her illness neoplasms and varied causes take to an eosinophilia picture (TORRE,1993).

In the beginning and during the execution of the work it was not told any complaint of the athletes that can justify the present eosinophilia to the beginning and final of the study. Second Toast, (1993), parasitoses is cause of more frequent eosinophilia, soon after the eosinophilia caused by allergic process comes. It is not possible to affirm indeed that these eosinophils values are caused by some allergic inflammation, asthma or parasitoses, because the necessary variables for this analysis were not present in this study, that objectified to verify the immunological answers posterior to the training, when actually the athletes already came presenting an immunological answer previous to the same. The eosinophils has as its main function capacity helminthotoxic, because they can be the main acting in the defense against some parasites, the other basic function is to modulate reactions of immediate hipersensibilidade and mediator of the late answer in the allergic asthma, however in spite of presenting these beneficial effects there are evidences that the eosinophils serves as mediators in damages to organs, because its granules contain basic proteins that present direct citotoxidade to the breathing epithelium (TORRES, 1993). The present eosinophilia in the group stays indefinite. The largest values than 500 cubic células/mm should be investigated, therefore it can be an indication to arrive to the diagnosis of a precocious indicator of some type of illness (TORRES,1993).

The results suggest that the training of seven weeks especially took the non significant alteration in the count of the white cells in what he/she tells respect the differential count of the leukocytes. The leukocytose gave him in function of the increase of the neutrophiles, reduction of the limphocytes, monocytes and eosinophils. The training produced effects on the eosynophilia presented by the athletes to the beginning of the work, possibly for the liberation of the cortisol through the activation of the axis HPA - hypotalamo-pituitary-adrenal, even so the same stayed with the increased values. It was not possible to illuminate what indeed it unchained the increase in these eosinophils values, but its reveals that the athletes were already presenting an immunological answer due to an allergic inflammation caused by an allergen or parasite. These reduced values can be considered as a positive answer considering the negative effects that this group of cells causes on the fabric through its granules. Besides promoting an adaptative immunological answer through the neutrophiles increase in the circulation without muscular inflammation what it generates larger fagocitos and destruction of bodies invaders and consequent increase of the immunity.

Recommendations

We suggested that new studies are accomplished with a larger time than 7 weeks of training to verify to what extent this training routine will generate muscular adaptation for the athletes and without inflammatory process.

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MUSCULAR DETRITION AND LEUCOCITOSE IN FUTSAL ATHLETES

Summary

The futsal is an intermittent modality that exposes the athletes a high risk of lesions. The objective of the present study was it of verifying the immunologicals answers of professional athletes of futsal to a period of 7 weeks of training. After this period the athletes presented a non significantly increase of 3% in the leukocytes occasioned per of the increase of 7% of the

neutrófilos. There was reduction of the immature neutrophil, eosinophils, lymphocyte and monocytes in 41.5, 18, 4.7 and 6.5%, respectively. In spite of the reduction of the eosinophils, these stayed above the reference values, what reveals that the athletes already came presenting an immunologicals answer previous to the training. We concluded that neutrophil increase happened in this study suggests that there was not occurrence of inflammatory process for muscular offense and the neutrophils they contributed to recovery and muscular adaptation to the training.

DESGASTES MUSCULARES Y LEUCOCITOSE EN ATLETAS DE FUTSAL

Resumo

El futsal es una modalidad intermitente que expone a los atletas un alto riesgo de lesiones. El objetivo del presente estudio fue lo de verificar las respuestas inmunológicas de atletas profesionales de futsal a un periodo de 7 semanas de entrenamiento. Después de este periodo los atletas presentaron un aumento no significativo del 3% en los leucócitos que se dio en función del aumento del 7% de los neutrófilos. Hubo reducción de los neutrófilos inmaduros, eosinófilos, linfocitos y monócitos en 41.5, 18 , 4.7 y un 6.5%, respectivamente. A pesar de la reducción de los eosinófilos, estos permanecieron por encima de los valores de referencia, lo que revela que los atletas ya venían presentando una respuesta inmunológica anterior al entrenamiento. Concluimos que neutrofilia ocurrida en este estudio sugiere que no hubo ocurrencia de proceso inflamatório por injuria muscular y los neutrófilos contribuyeron para recuperación y adaptación muscular al entrenamiento.

USURE MUSCLEE ET LEUCOCITOSE DANS ATHLETES DE FUTSAL

Résumé

Le futsal est une modalité intermittente qui expose un haut risque de lésions aux athlètes. L'objectif de l'étude présente était lui de vérifier les athlètes professionnels de futsal réponses immunologiques à une période de 7 semaines de former. Après que cette période les athlètes aient présenté une augmentation aucun considérable de 3% dans le leucócitos qu'il/elle a senti dans la fonction de l'augmentation de 7% du neutrófilos. Il y avait réduction des neutrófilos immatures, eosinófilos, lymphocytes et monócitos en 41.5, 18, 4.7 et 6.5%, respectivament .Malgré la réduction de l'eosinófilos, ceux-ci sont restés au-dessus des valeurs de la référence, que révèle que les athlètes présentaient déjà une réponse immunologique antérieure à la formation. Nous avons conclu que les neutrofilia se sont passés dans cette étude suggère qu'il n'y avait pas événement du procès pour offense musclée et le neutrófilos contribués pour récupération et adaptation musclée à la formation.

DESGASTES MUSCULARES E LEUCOCITOSE EM ATLETAS DE FUTSAL

Resumo

O futsal é uma modalidade intermitente que expõe aos atletas um alto risco de lesões. O objetivo do presente estudo foi o de verificar as respostas imunológicas de atletas profissionais de futsal a um período de 7 semanas de treinamento. Após este período os atletas apresentaram um aumento não significativo de 3% nos leucócitos que se deu em função do aumento de 7% dos neutrófilos. Houve redução dos neutrófilos imaturos, eosinófilos, linfócitos e monócitos em 41.5, 18, 4.7 e 6.5%, respectivamente. Apesar da redução dos eosinófilos, estes permaneceram acima dos valores de referência, o que revela que os atletas já vinham apresentando uma resposta imunológica anterior ao treinamento. Concluímos que neutrofilia ocorrida neste estudo sugere que não houve ocorrência de processo inflamatório por injúria muscular e os neutrófilos contribuíram para recuperação e adaptação muscular ao treinamento.