70 - THE MORE COMMON LESIONS AT SOCCER, FUTSAL, BASKETBALL, VOLLEYBALL AND ITS BIOMECHANIC CORRELATIONS FOUND IN THE ATHLETES OF SPORTS MUNICIPAL CENTERS OF JACAREZINHO-PARANÁ

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Introduction

The regular practice of physical activities brings benefits to the health improving the growing and development of young athletes, though we find various myths about the physical activities practice in the adolescence and countless doubts as to the influence of it on phenomena such as skeletal growing and the biological maturation. The physical activity in this phase is not out of risk, once the bruises in the sport are quite often due to the bone structure and the structures connected to it such as tendons and muscles, which are changing in this phase so they are hurt more easily (VIEIRA et al., 2002).

According to Gallahue and Ozmun (2003), the growing is a continuous process that starts in the conception and just gets to an end at death. It is connected to the age, but does not only depend on it. However, the growing, following Haywood and Getchell (2004), starts within the fertilization and it stops at adult age, about the 20 years. This phase is characterized for meaningful differences between the same chronological age individuals, once this difference is determined by maturation. According to the authors, maturation is caused by changes in the biochemical composition of the cells, leading them to a qualitative advance. Not being necessarily dependent on the increase of its size.

Nevertheless, the corporal growing, chronological age, and physiological maturation are related with one another and this way the adolescent tends to grow in size and then improve as to gets older.

Various motives are responsible for happening the lesion onto the athletes. According to Whiting and Zernicke (2001), the lesion is a sorrowful occurrence in the everyday life, once it is a harm that is caused by physical trauma that the corporal tissues had, occurring the loss of the normal functions and followed by inevitable physical and emotional costs.

The biomechanics of the sports studies the strengths and their effects on human beings, when they are practicing sportive modalities. The goal of the sports biomechanics is getting athletes' performance improved, as the demand of a determined modality may be one of the responsible for the lesions. Sports professionals, through biomechanics knowledge, can identify the strength that would be causing the lesion, so preventing and enhancing the rehabilitation with specific exercises (McGINNIS, 2007).

Once we know the sports practice leads to inevitable traumas (lesions) and biomechanics unbalance, a research with youngsters was started at sports municipal centers in Jacarezinho city. The Physical Education and Physiotherapy State College of Jacarezinho has set up connection with the Education, Culture and Sports Office, by the Sports Municipal Department of Jacarezinho, effecting the orthopedic, traumalogic and sportive physiotherapy project that helps the athletes of these centers. This project acts on the prevention and treatment of joining unbalances, traumas, lesions, and maladjusted postures that can bring deviations to the young athletes' biomechanics function.

The Prevention Programs can help the sportive practice to enhance its benefits to the athletes' health and minimize the occurrence of lesions (ELLENBECKER, 1992; WILK et al, 1993).

This article has as a goal to compare the most common lesions presented by the athletes on the biomechanics of the practiced modalities, taking into consideration maturation, growing, training period, and their interferences into these young athletes' health.

Methodology

This research is a transversal study of field accomplished with 176 athletes aged between 6 and 17 years and both male and female, volunteers, with standard average and deviations. The participant athletes of the research were grouped according to the sportive modality and sex: 43 athletes of male futsal and 12 female futsal, 73 male soccer, 15 male basketball, and 12 female basketball, and 21 female volleyball of the Sports Municipal Centers of Jacarezinho.

A questionnaire by Baptista et al. (1999) was adapted and applied, and soon a physiotherapist evaluation individually, containing identification, clinic anamnese, physical examination as inspection, anthropometrics measures, measurements, perimeter (perimetria), muscle strength, mobility test, postural assessment, among others.

The evaluations were applied in the year of 2007, in the Physical Education and Physiotherapy State College buildings of Jacarezinho (UENP). And the data were worked in Excel 2007.

It was also accomplished analyses of the postural alterations and compared to the phase of the athletes' maturation and growing. The signs of lesions gotten in the activities above cited were also arranged in columns, and compared to the biomechanics of the physical activity.

Despite all of this work, we limited ourselves to verify the lesions reported by the athletes at the clinic anamnese, considering lesion the report of pain on some corporal segments nearly diary and that in any way disturb their performance in the trainings and also in their personal lives.

Results

Of the 176 evaluated athletes 68 % reported lesions, with minimum age of 6 and maximum of 17 years as presented in the table 1. The respective averages and standard deviations are: **male** athletes 131: age 13 (2), height 158 cm (15), weight 37 kg (9), and training period of 20,5 months (13); **female** athletes 45: age 13 (2), height 152 cm (7), weight 49 kg (8), and training period 19,4 months (23), according to the table 2.

The most common lesions reported by the young athletes were: in the male futsal, 36% knee and 37% lumbar column; in the male soccer, 50% lumbar column and 40% knee and 33% ankle; in the female futsal, 37% knee and 25% lumbar column; in the female volleyball, 24% knee and 24% breast column; and in the female basketball, 37% ankle and 25% wrist, according to the table 3.

Table 1 - Total of athletes evaluated and lesions of Sports Municipal Centers of Jacarezinho	
Athletes	176
Lesions	68%

Table 2 - Average (A) and Standard Deviations (SD) of the Young athletes									
Sex	total	A - age	DP	A - height	SD	A - weight	SD	A - trainig period	SD
Male	131	13 years	2	158 cm	15	37 Kg	9	20,5 months	13
Female	45	13 years	2	152 cm	7	49 Kg	8	19,4 months	23

Table 3 - The most common lesions						
Modality	Futsal		Basketball		soccer	volleyball
sex	male	fem.	masc.	fem.	male	fem.
lesions	Knee 36%	Knee 37%	Knee 40%	Ankle 37%	Lumbar C. 50%	Knee 24%
	Lumbar c. 37%	Lumbar c. 25%	Ankle 33%	Wrist 25%	Knee 40%	Breast c. 24%

Discussion

Futsal is a modality practiced a lot all over the world, chiefly in Brazil that counts more than 12 million of adepts according to the Futsal Brazilian Confederation. And it is supposed that is the modality that causes the most lesions in the world, twice more than soccer. This may be due to the difference between floors, and the size of the field, that leads a high speed on the moves (JUNGE et al., apud RIBEIRO e COSTA, 2006). However, studies have been showing that the most common lesions are on the thigh, leg, and ankle (RIBEIRO E COSTA, 2006), agreeing partially with findings by Ribeiro et al. (2003), that point out the segments foot/ankle, knee and thigh.

Through this study, we can see that the most common lesions in futsal, as female, as male they were on the knee (male 36% and female 37%) and on the lumbar column (male 37% and female 25%).

Ribeiro et al. (2003) carried out a research with 50 male federated athletes of a paulista club of futsal with ages between 9 and 16 years, who practiced futsal, and the most common lesions were on 46% foot and ankle, and 19% knee. The authors conclude that the postural alterations increased the incidence of lesions on the athletes of this study when compared to the control group.

Among sportive modalities practiced in Brazil, undoubtedly, the soccer has the larger number of adepts. So the biomechanics of this modality becomes important in order the professionals can take the proper cares avoiding lesions. Fraccaroli (1981) considers essential study the kick that is the goal of the game, the heading, the holding and goalkeeper's situations. Once that in a match situation, the soccer player must be prepared to move at the most varied positions and that represents a state of unstable and stable balance. These moves make the most common lesions of these modalities are on inferior limbs, chiefly on the ankle and knee (LEITE and CAVALCANTI NETO, 2003).

The results from the most common lesions at the soccer of this study were also a lumbar column (50%) and the knee (40%) as at the futsal. Reminding that the young athletes' team that trains soccer is male only.

Stewien and Camargo (2005) accomplished a survey about occurrence of lesions on the knee with 97 athletes, of what 50 were male and 47 female, players of soccer team of first division of state of Amazonas, on average of ages of 26,7 years for men and 23,5 for female and on training period average of 154 months and 113 consecutively. All of them were first interviewed by the authors and soon examined by the latter what took a month. Of the 97 players 32% of the male one and 23% of the female one had already had any lesion on the knee and 4% of the athletes of both teams male and female had already had hurt both the knees. However, half of these lesions occurred on young athletes and in shorter training period.

According to Sacco et al. (2004), the basketball has become more and more popular in Brazil and being a modality that requires intense and brief efforts they are accomplished in the more varied paces. It is the most lesions sport causer. Of these lesions, the inferior limbs are the most overloaded due to the constant leaps and moves, once the ankle is the most hurt corporal segment.

Within the results of this study on this modality the most common lesions were (40%) on the knees and (33%) on the ankle, but (37%) on the ankle and (25%) on the wrist with the female one.

In Moreira, Gentil and Oliveira's studies (2003), they sought the lesions prevalence of the basketball Brazilian team over the preparation for the world championship in 2002. They collected data from 16 athletes aged between 17 and 31 years (average of 24,5 years). Of the lesions reported by these athletes (12.8%) on the ankle and (8.8%) on the hands, they were the most common lesions.

Another modality that has been adding adapts in Brazil is the volleyball, chiefly because of the last male Brazilian team results. Over a match a lot of motor acts happens (from 250 to 300), so that the fast short runs, leaps, and “peixinhos” are the most often. The leaps are the major preoccupations as to the lesions in the volleyball (60%), they are represented by the service, blockade, and attack once these are the most efforts in the game. The actions in this modality are of strength and potency, non-cyclical, with rest passive or active (MARQUES JUNIOR, 2004).

The most common lesions in the female volleyball were (24%) on the knee and (24%) on the breast column.

Santos et al. (2005) carried out a study on whitch they analyzed 14 athletes with average ages of 23.8 years and with a training period on average of 7.7 years, titular one of a male non-professional volleyball team. The athletes were questioned about lesions, taped over the training and measured via acelerometry making blockage and cuts. The authors verified the local and number

of lesions on the athletes, once the sum reached 78 lesions. Finally, the most hurt segments were (22) the ankle and (8) the knee.

The comparison between the lesions happened and the biomechanics of the sport demonstrates that the join of the knee is prepared only to accomplish the axial rotation over the flexibility (HAMIL & KNUTZEN, 1999). Once in the soccer and in the futsal this rotation may occur on the knee in extension, when the foot is fixed on the ground with the thigh rotation, as in the move of the game, passing the ball, throwing it, lateral moves and sudden stops. These biomechanics characteristics also occur over the impact deadening after a cut or blockade in the volleyball and tray or jump in the basketball, also representing risks the ankle join, that in these moves present great instability at the position of planti-flexibility and inversion (KAPANDJI, 2000).

According to the underlying basis of the sports the articular biomechanics can not be enough to support the join which is overcome by the corporal weight added by the gravity action and the leap potency (SMITH et al, 1997), causing lesions for repeated moves or straight traumas suffered by the knees, lumbar column and ankles to the contractures, distensions, inflammations, degenerating processes increasing even more the articular unbalance causing the lesions.

Conclusion

From the gotten results, we can conclude that the each sport biomechanics compares to the lesions mechanism found, being analyzed through the specification of each sport, their underlying basis as to the anatomy, biomechanics, lesion mechanism, and agonist/antagonist relations. Considering also straight traumas and the postural alterations made clear by the evaluated athletes' maturation period, growing and postural habits.

Each athlete must be considered individually with all the influences above, assuring the control of the entire variable onto lesion prevention.

This research supports scientific data for a application of a Preventive Physiotherapy Program which has already been applied by Traumalogic Orthopedic Physiotherapy and Sportive Project - FAEFIJA in connection to the Sport Municipal Department of Jacarezinho.

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THE MORE COMMON LESIONS AT SOCCER, FUTSAL, BASKETBALL, VOLLEYBALL AND ITS BIOMECHANIC CORRELATIONS FOUND IN THE ATHLETES OF SPORTS MUNICIPAL CENTERS OF JACAREZINHO-PARANÁ

ABSTRACT

The prevention programs may help the sports practice to enhance their benefits to the athletes' health and minimize the lesions occurrence. (ELLENBECKER, 1992; WILK et al, 1993). OBJECTIVE: Compare the most common lesions to the biomechanics of the practiced modalities by the athletes taking into consideration the maturation, growing, training time. METHODOLOGY: A questionnaire and a physiotherapeutic evaluation were applied to 176 athletes within the modalities of male and female futsal and basketball, male soccer and female volleyball of the Sports Municipal Centers of Jacarezinho. They verified the

related lesions by the athletes at clinic anamnese, comparing the averages with the biomechanics of each modality. The sample was considered homogeny analyzing averages and standard deviations male and female respectively: **male** 131 athletes: age 13 (2), height 158 cm (15), weight 37 kg (9), and training period of 20,5 months (13); **female** 45 athletes: age 13 (2), height 152 cm (7), weight 49 kg (8), and training period 19,4 months (23). RESULTS: 68% of the athletes had lesions. These lesions: Male futsal, 36% knee and 37% lumbar column; Male soccer, 50% lumbar column and 40% knee; Male basketball, 40% knee and 33% ankle; Female futsal, 37% knee and 25% lumbar column; Female volleyball, 24% breast column and 24% knee; Female basketball, 37% ankle and 25% wrist. CONCLUSION: The found lesions at each sport can be compared to biomechanics and its specification, inasmuch as they can be enhanced by the postural alterations made clear through the period of maturation, growing, and athletes' postural habits assessed. These data may be the base for a Preventive Physiotherapeutic Program improving the quality of life and production of the young athletes.

KEY WORDS: sportive physiotherapy; biomechanics; lesion.

LES BLESSURES DE PLUS GRANDE INCIDENCE DANS Le FOOTBALL, FOOTBAL DE SALON, BASKET-BALL, VOLLEY-BALL ET LEURS CORRÉLATIONS BIOMÉCANIQUES TROUVÉES DANS LES ATHLÈTES D'ÉCOLE MUNICIPAUX DE SPORTS DE JACAREZINHO-PARANÁ

RESUME

Les programmes de prévention peuvent assister la pratique du sport à exacerber leurs bénéfices à la santé des athlètes et à minimiser la présence de blessures. (ELLENBECKER, 1992 ; WILK et al, 1993). OBJECTIF : Corréler les blessures de plus grande incidence avec la biomécanique des modalités pratiquées par les athlètes en prenant dans considération la maturation, la croissance, le temps de formation. MÉTHODOLOGIE : A été réalisé un questionnaire et une évaluation physiothérapeutique dans 176 athlètes dans les modalités de futsal et un basket-ball masculin et féminin, un football masculin et un volley-ball féminin de l'école Municipaux de Jacarezinho. Ce sont vérifiées les blessures dites par les athlètes dans l'anamnèse clinique, corrélant les moyennes avec la biomécanique de chaque modalité. L'échantillon a été considéré homogenia en s'analysant moyennes et détours normes masculin et féminin respectivement : **sexe masculin** 131 athlètes : âge 13 ans (2), hauteur 158 cm (15), poids 37 kg (9) et temps d'entraînement de 20.5 mois (13) ; **sexe féminin** 45 athlètes : âge 13 ans (2), hauteur 152 cm (7), poids 49 kg (8), et temps d'entraînement 19.4 mois (23). EN RÉSULTANT : 68% des athlètes a présenté des blessures. De ces blessures : Footbal de salon masculin, genou 36% et colonne lombaire 37% ; Football masculin, colonne lombaire 50% et genou 40% ; Basket-ball masculin, genou 40% et cheville 33% ; Futsal féminin, genou 37% et colonne lombaire 25%, Volley-ball féminin, colonne thoracique 24% et genou 24% ; Basket-ball féminin, cheville 37% et poing 25%. CONCLUSION : Les blessures trouvées dans chaque sport se rapportent avec la biomécanique et leur spécificité, pouvant être accentuées par les modifications afférent à position prouvées par la période de maturation, de croissance et d'habitudes afférent à position des athlètes évalués. Ces données peuvent baser un Programme de Physiothérapie Préventive en améliorer la qualité de vie et le revenu des jeunes athlètes

MOTS CLES: La physiothérapie sportive ; la biomécanique ; la blessure.

LAS LESIONES DE MAYOR INCIDENCIA EN EL FÚTBOL, FÚTBOL DE SALÓN, BÁSQUETBOL, VOLEIBOL Y SUS CORRELACIONES BIOMECÁNICAS ENCONTRADAS EN LOS ATLETAS DE ESCUELAS MUNICIPALES DE DEPORTES DE JACAREZINHO-PARANÁ

RESUMEN

Los programas de prevención pueden ayudar en la práctica deportiva a exacerbar sus beneficios a la salud de los atletas y reducir la ocurrencia de lesiones (ELLENBECKER, 1992; WILK et al, 1993). OBJETIVO: Correlacionar las lesiones de mayor incidencia con la biomecánica de las modalidades practicadas por los atletas tomando en consideración la madurez, crecimiento, tiempo de entrenamiento. METODOLOGÍA: fue realizado un cuestionario y evaluación fisioterapéutica en 176 atletas de las modalidades de fútbol de salón y básquetbol masculino y femenino, fútbol masculino y voleibol femenino de las Escuelas Municipales de Jacarezinho. Se verificaron las lesiones relatadas por los atletas en la consulta clínica, correlacionando los promedios con la biomecánica de cada modalidad. La muestra fue considerada homogénea analizándose promedios y desvíos padrones masculino y femenino respectivamente: **sexo masculino** 131 atletas: edad 13 años (2), altura 158 cm. (15), peso 37 Kg. (9) y tiempo de entrenamiento de 20,5 meses (13); **sexo femenino** 45 atletas: edad 13 años (2), altura 152 cm. (7), peso 49 Kg. (8), y tiempo de entrenamiento 19,4 meses (23). RESULTADO: el 68% de los atletas presentaron lesiones. De estas lesiones: Fútbol de salón masculino, rodilla el 36% y columna lumbar el 37%; Fútbol masculino, columna lumbar el 50% y rodilla el 40%; Básquetbol masculino, rodilla el 40% y tobillo 33%; fútbol de salón femenino, rodilla 37% y columna lumbar 25%, Voleibol femenino, columna torácica el 24% y rodilla el 24%; Básquetbol femenino, tobillo el 37% y puño el 25%. CONCLUSIÓN: Las lesiones encontradas en cada deporte se relacionan con la biomecánica y su especificidad, pudiendo ser acentuadas por las alteraciones posturales evidenciadas por el período de maduración, crecimiento y hábitos posturales de los atletas evaluados. Estos datos pueden servir de base a un Programa de Fisioterapia Preventiva mejorando la calidad de vida y rendimiento de los jóvenes atletas.

PALABRAS-CLAVE: fisioterapia deportiva; biomecánica; lesión.

AS LESÕES DE MAIOR INCIDÊNCIA NO FUTEBOL, FUTSAL, BASQUETEBOL, VOLEIBOL E SUAS CORRELAÇÕES BIOMECÂNICAS ENCONTRADAS NOS ATLETAS DE ESCOLINHAS MUNICIPAIS DE ESPORTES DE JACAREZINHO-PARANÁ

RESUMO

Os programas de prevenção podem auxiliar a prática esportiva a exacerbar seus benefícios à saúde dos atletas e minimizar a ocorrência de lesões. (ELLENBECKER, 1992; WILK et al, 1993). OBJETIVO: Correlacionar as lesões de maior incidência com a biomecânica das modalidades praticadas pelos atletas levando em consideração a maturação, crescimento, tempo de treinamento. METODOLOGIA: Foi realizado um questionário e avaliação fisioterapêutica em 176 atletas nas modalidades de futsal e basquetebol masculino e feminino, futebol masculino e voleibol feminino das Escolinhas Municipais de Jacarezinho. Verificaram-se as lesões relatadas pelos atletas na anamnese clínica, correlacionando as médias com a biomecânica de cada modalidade. A amostra foi considerada homogenia analisando-se médias e desvios padrões masculino e feminino respectivamente: **sexo masculino** 131 atletas: idade 13 anos (2), altura 158 cm (15), peso 37 kg (9) e tempo de treino de 20,5 meses (13); **sexo feminino** 45 atletas: idade 13 anos (2), altura 152 cm (7), peso 49 kg (8), e tempo de treino 19,4 meses (23). RESULTADO: 68% dos atletas apresentaram lesões. Destas lesões: Futsal masculino, joelho 36% e coluna lombar 37%; Futebol masculino, coluna lombar 50% e joelho 40%; Basquetebol masculino, joelho 40% e tornozelo 33%; Futsal feminino, joelho 37% e coluna lombar 25%, Voleibol feminino, coluna torácica 24% e joelho 24%; Basquetebol feminino, tornozelo 37% e punho 25%. CONCLUSÃO: As lesões encontradas em cada esporte se relacionam com a biomecânica e sua especificidade, podendo ser acentuadas pelas alterações posturais evidenciadas pelo período de maturação, crescimento e hábitos posturais dos atletas avaliados. Estes dados podem embasar um Programa de Fisioterapia Preventiva melhorando a qualidade de vida e rendimento dos jovens atletas.

PALAVRAS-CHAVE: fisioterapia desportiva; biomecânica; lesão.