27 - INCIDENCE OF INJURIES IN IRONMAN BRAZIL 2006 ATHLETES

THIAGO GONSAGA DE SOUZA; ELINAI DOS SANTOS FREITAS;
GUSTAVO RICARDO SCHUTZ; MARCEL HUBERT; LUCIANA GASSENFERTH ARAÚJO
Aquatic Biomechanics Research Laboratory, Center of Health and Sport Sciences,
Santa Catarina State University Florianópolis, Santa Catarina, Brazil
gonzaga_tgs@yahoo.com.br

INTRODUCTION

The Ironman World Triathlon Championship or Ironman Triathlon is an annual race that was first held in 1978 in Honolulu, Hawaii, idealized by U.S. Navy Commander John Collins. Race consists in 3.8km of swimming, 180km of cycling 42km of running. In Brazil, Ironman has been held since 2001 in Florianópolis, Santa Catarina. Number of competitors has been growing every year: in 2001, 250 athletes started the race and in 2007, more than 1,200 athletes.

Day after day there are more fans of this event that challenges the competitors to practice three sports in a single contest. But the number of hours and the volume of training may increase the rate of injuries that would cause the interruption of practice and the need of treatment. According to Freitas and Pereira (2004) the main reason of training interruption for triathlon athletes is the occurrence of an injury.

One believes the verification of injuries incidence, the affected body regions and the diagnosis could be a helpful tool for coaches and athletes when planning programs of prevention aiming to decrease occurrences and rates of recidivism, optimizing athletes' capacities and improving their performance (FAQUIN et al., 2005).

According to Freitas et al. (2007), triathlon is still in development and there is a lack of studies about it; because of this, there is a need of scientific studies regarding issues related to the modality in order to contribute to its evolution.

The aim of this study was to identify the incidence of injuries in Ironman Brazil 2006 athletes, regarding the frequency of occurrence, the injured body region and the diagnosis.

METHOD

The sample was composed by 209 (176 male and 33 female) athletes from different countries that participated of Ironman Brazil 2006. The average age of male subjects was 398 years old and of female subjects was 409 years old. Men have been practicing triathlon for 108 years and women have been practicing the modality for 86 practice years.

The instrument used was a mixing questionnaire adapted from the one elaborated by the National Center of Sports Excellency, in a partnership with the Government Sports Department in Brazil, for the Project "Champion Profile". The questionnaire is composed by 11 questions regarding some aspects of athletes' sporting life, such as personal data, training and performance information, injuries and others.

This study considered the following questions: *How old were you when you started practicing this modality?*, which provided information about the time of practice through the difference between the current age and the age of the practice start; *Have you ever had, in the past, some injury related to this modality?*, which supplied information about the incidence of injuries, affected body regions and diagnosis.

The questionnaire was answered days before the competition, through a previous. After a brief explanation of the study procedures athletes were invited to participate.

The answers composed a database. Data were analyzed through the descriptive statistics (mean, standard deviation, simple frequency and percentage). The statistical package SPSS 11.0 was used.

RESULTS AND DISCUSSION

Regarding injuries incidence, 127 subjects (60%) had already suffered some injury related to the modality. According to Collins (1989) injuries prevalence in Ironman athletes is about 90%. Freitas and Pereira affirm injuries are negative factor for training because they affect the annual training planning and cause a decrease in athletes' motivation. Table 2 presents the injured body regions.

Table 2: Injured body regions of Ironman Brazil 2006 athletes.

Upper limb *	n	%	Lower limb **	n	%	Trunk ***	n	%
Shoulder	46	68.7%	Hip	29	11.9%	Head	4	15.4%
Arm	2	3.0%	Thigh	25	10.2%	Cervical	5	19.2%
Elbow	8	11.9%	Knee	69	28.3%	Thoracic	1	3.8%
Forearm	2	3.0%	Leg	38	15.6%	Lumbar	15	57.7%
Handle	5	7.5%	Ankle	43	17.6%	Pubis	1	3.8%
Hand	4	6.0%	Foot	40	16.4%			

* Number of subjects who reported injury in more than one place: 9;
** Number of subjects who reported injury in more than one place: 65;
*** Number of subjects who reported injury in more than one place: 2.

In upper limb (MMSS) shoulder was the most affected region (68,7%). Richardson cited by Domingues (1995) affirms shoulder pain is the most common orthopedic problem among competitive swimmers.

Regarding the lower limb (MMII), knee was the most affected region (38,8%) followed by the ankle (17,6%) and foot (16, 4%). Data agree with information presented by Williams et al. (1988), who showed knee was the most injured region for triathlon athletes, ranging from 22% to 51,3%; following the knee, ankle and foot injuries range from 11% to 21% of occurrences. It was verified a high injury rate in MMII and according to Cipriani et al. (1998) the lower limb regions are constantly under impact forces of body weight supporting during running; and also lower limbs play an important role to generate forces during cycling.

Laurino and Alloza (2003) cite there are controversies in the literature regarding the groups of injuries that most occur in triathlon; lower limbs are most affected by overload injuries (36% up to 90% of incidence) while upper limbs represent 6,5% up

to 24,4% of incidence.

In the trunk, lumbar region was the most affected (57,7%), agreeing to the literature. Laurino and Alloza (2003) affirmed low back pain represents 4 up to 28% of injuries in trunk and athletes usually complain about it. In O'Toole's study (2001), 72% of athletes reported low back pain. Cycling can be considered the modality that more predisposes the occurrence of low back pain. The trunk flexion positioning for long periods during cycling has been described as a factor of increase of intradiscal pressure, which leads to the development of back pain (LAURINO; ALLOZA, 2003).

Table 3 presents data related to injuries' diagnosis.

Table 3: Injuries' diagnosis in upper limbs, lower limbs and trunk

Diagnosis	Upper limbs	Lower limbs	Trunk
Muscle Injury	56%	53%	46%
Bone Injury	15%	17%	16%
Skin Injury	15%	10%	23%
Ligament Injury	14%	20%	14%

In upper limb muscle injuries were most common representing 56% of cases. Korkia (1994) and Freitas (2007) also found a prevalence of muscle injuries in relation to other diagnosis. Other diagnoses agree with incidence order presented in literature: bone injuries (15%), skin injuries (15%) and ligament injuries (14%).

Regarding lower limbs, the results are similar to those found in literature. There is a predominance of muscle injuries (53%) followed by ligament (20%), bone (17%) and skin (10%) injuries.

In trunk the most common diagnosis was muscle injury (46%) and lumbar region was the most affected, according to the results of Vleck (1998), when 15,8% up to 17,9% of the subjects presented injuries in this region, depending on the performance level of the athletes.

CONCLUSION

One observed a very high injury rate, 60% of the total. The most affected region of lower limbs was the knee; of upper limbs, the shoulder; and of the trunk, the lumbar region. Injuries reported by the athletes are usually related to the specific modalities. In swimming, it is higher the incidence of injuries in shoulder; in cycling, the most affected place is the lumbar region; and in running, the knee is the most affected region. The incidence of muscle injuries was higher than the incidence of bone, ligament and skin injuries. By identifying the incidence of injuries, the affected body regions and the diagnosis this study provides subsides to plan prevention programs in order to decrease the occurrence and recidivism of injuries.

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Rua Santa Clara, 540 Barreiros
São José Santa Catarina Brasil.
(48) 9915-6732

INJURIES INCIDENCE IN IRONMAN BRAZIL 2006 PARTICIPATING

ABSTRACT

The Ironman is a triathlon race that consists in 3.8km of swimming, 180km of cycling 42km of running. The number of hours and the volume of training of Ironman athletes may increase the rate of injuries that would cause the interruption of practice and the need of treatment. The aim of this study was to identify the incidence of injuries in Ironman Brazil 2006 athletes, regarding the frequency of occurrence, the injured body region and the diagnosis. The sample was composed by 209 (176 male and 33 female) athletes from different countries. A mixing questionnaire was used as instrument to identify the time of practice and the incidence of injuries (affected body region and diagnosis). 127 subjects (60%) had already suffered some injury related to the modality. In upper limb shoulder was the most affected region (68,7%)Regarding the lower limb (MMII), knee was the most affected region (38,8%) followed by the ankle (17,6%) and foot (16, 4%). In the trunk, lumbar region was the most affected (57,7%). Muscle injury was the most common diagnosis for all of the body segments (56% in upper limbs, 53% in lower limbs and 46% in trunk). Injuries reported by the athletes are usually related to the specific modalities: in swimming, it is higher the incidence of injuries in shoulder; in cycling, the most affected place is the lumbar region; and in running, the knee is the most affected region. By identifying the incidence of injuries, the affected body regions and the diagnosis this study provides subsides to plan

prevention programs in order to decrease the occurrence and recidivism of injuries.
KEY-WORDS: Ironman, injury, epidemiology.

INCIDÉNCE DE LÉSION DANS DES PARTICIPANTS DE L'IRONMAN BRÉSIL 2006
RÉSUMÉ

L'Ironman est une course de triathlon qui consiste en 3,8 km de natation, 180 km de cyclisme suivant de 42 km de course à pied. Dû aux heures et la quantité d'entreinement les blessures finissent par la principale raison pour l'interruption d'entreinement et sa planification. L'objectif de ce travail a été de vérifier l'incidence de blessures dans des participants de l'Ironman Brésil 2006 et vérifier leurs lésions plus communes en contribuant ainsi à la croissance des recherches dans la modalité. 209 athlètes ont participé d'étude, les jours qui ont précédé la compétition, ils ont repondu un questionnaire identifiant le temps de pratique de la modalité, la description de blessures, le lieu blessée et le diagnostic clinique. Des 209 interviewés, 127 athlètes (60.8%) ont dit d'avoir eu des blessures. Dans les membres supérieurs, 46 sujets ont eu des blessures dans l'épaule (68.7%). Dans les membres inférieurs, 69 sujets (38.8%) ont répondu avoir eu quelque blessure dans le genou, suivant par la cheville avec 43 sujets (17.6%) et pied avec 40 sujets (16.4%). Dans le tronc, 15 sujets ont été attaqués par des blessures dans la région lombaire (57.7%). Les blessures musculaires ont prédominé tant dans les membres supérieurs (56%), que dans les membres inférieurs (53%) et aussi dans le tronc (46%). Les blessures summis par les athlètes sont des blessures caractéristiques des trois disciplines : épaule dans la natation, région lombaire dans le cyclisme et genou dans la course. À travers de l'identification des blessures, avec leurs respectifs lieux et diagnostics, c'est possible de fournir des conseils à des travaux de prévention par diminuer la présence de lésion et la rechute et aussi évitant que l'athlète s'éloigne de la modalité.
MOTS-CLES: Ironman, lésion, épidémiologie

INCIDENCIA DE LESIONES EN PARTICIPANTES DO IRONMAN BRASIL 2006
RESUMEN

El Ironman es una prueva de triatlon que consiste de 3,8Km de natacion, 180Km de ciclismo seguido de 42Km de carrera. Devido a las horas y al volume de entrenamiento son las lesiones el principal motivo para interrupcion del entrenamento prejudicando el planteamento del entrenamento. El objetivo deste trabajo fue verificar la incidencia de lesiones en participantes del Iroman Brasil 2006 y verificar sus acometimentos mas comunes contribuiendo asi para el crecimiento de las investigaciones en la modalidad. Participaran de la investigación 209 triatletas que responderan, en los dias que antecedieron la competición un cuestionario del tipo misto identificado tiempo de pratica de la modalidad, historico de lesiones, local y diagnostico clinico. De los 2009 entrevistados, 127 atletas(60,8%) relataran el ocurrimiento de lesiones. En los miembros superiores, 46 individuos tuvieron lesiones en el ombro(68,7%). En los miembros inferiores, 69 individuos (38,8%) respondieron que tuvieron alguna lesión en la rodilla, luego por el tobillo com 43 individuos(17,6%) y pie com 40 individuos(16,6%). En el tronco, 15 individuos sufrieron lesión en la región lumbar (57,7%). Las lesiones musculares predominaram tanto en los mienbros superiores (56%), como en los miembros inferiores (53%) y tambien en el tronco (46%). Las lesiones relatadas por los atletas son lesiones caracteristicas de las tres modalidades: ombro en la natación, región lumbar en el ciclismo y rodillase la carrera.Atraves de la indentificación de las lesiones, de acuerdo com sus locales y diagnosticos, es posible ofrecer subsidio a trabajos de prevension, buscando diminuir la ocurrencia y reincidencia, evitando que el atleta afastese de la modalidad.
PALABRAS-CLAVE: Ironman, lesiones, epidemiologia.

INCIDÊNCIA DE LESÕES EM PARTICIPANTES IRONMAN BRASIL 2006
RESUMO

O Ironman é uma prova de triatlon que consiste de 3,8km de natação, 180km de ciclismo seguido de 42km de corrida. Devido às horas e ao volume de treinamento as lesões acabam sendo o principal motivo para interrupção do treinamento prejudicando o planejamento do treinamento. O objetivo deste trabalho foi verificar a incidência de lesões em participantes do Ironman Brasil 2006 e verificar seus acometimentos mais comuns contribuindo assim para o crescimento das pesquisas na modalidade. Participaram da pesquisa 209 triatletas que responderam, nos dias que antecederam a competição, um questionário do tipo misto identificando tempo de prática da modalidade, histórico de lesões, local e diagnóstico clínico. Dos 209 entrevistados, 127 atletas (60,8%) relataram terem tido lesões. Nos membros superiores, 46 sujeitos tiveram lesões no ombro (68,7%). Nos membros inferiores, 69 sujeitos (38,8%) responderam terem tido alguma lesão no joelho, seguido pelo tornozelo com 43 sujeitos (17,6%) e pé com 40 sujeitos (16,4%). No tronco, 15 sujeitos foram acometidos por lesão na região lombar (57,7%). As lesões musculares predominaram tanto nos membros superiores (56%), como nos membros inferiores (53%) e também no tronco (46%). As lesões relatadas pelos atletas são lesões características das três modalidades: ombro na natação, região lombar no ciclismo e joelho na corrida. Através da identificação das lesões, com seus respectivos locais e diagnósticos, é possível fornecer subsídios a trabalhos de prevenção, buscando diminuir a ocorrência e reincidência, evitando que o atleta se afaste da modalidade.
PALAVRAS-CHAVE: Ironman, lesões, epidemiologia.