POST 1.5.3

Biological markers in the pre-competition and competition phases of triathlon

Blanca R. Rangel-Colmenero, Germán Hernández-Cruz, Fernando A. Ochoa-Ahmed, Adrián Rosas-Taraco, Hugo Zuazua-Aguirre, Oscar Salas-Fraile

1Faculty of Sport Organization, UANL, Nuevo León, México; 2Faculty of Medicine, UANL, Nuevo León, México

The physiological effects induced by the training process can be assessed by biological markers, which can be used for monitoring workloads in training to power up sport performance. In the present study the creatine kinase, urea and immune response behavior was analyzed, during the precompetitive and competitive phases of a master category triathlon team in Monterrey, Mexico, with the main objective of establishing the biological standards for our Mexican athletes and with this to develop personalized training programs in order to accomplish better results in this particular sport.

The sample was composed of twelve male athletes (age M=36.41, SD=5.51; height M=179.33 cm, SD=8.02; weight M=81.84 Kg, SD=10.97; Body mass index M=25.25 Kg/m², SD=1.11), the athletes participation was voluntary with a consent letter. Total blood and serum samples were taken, for the quantification of neutrophils, eosinophilis, basophilis, lymphocytes and monocytes and also for creatine kinase and urea. The samples were taken weekly in the first hour before the athlete started the physical activity during five weeks in the precompetitive training (samples 1-5), during the competition the samples were taken in the next order: immediately after de competition (sample 6), two hours after the competition (sample 7), 48 hours after competition (sample 8) and one week after the competition when the triathletes performed soft physical activity, for recovery (sample 9).

During the training period a constant concentration of urea and the analyzed cells (neutrophils, eosinophilis, basophilis, lymphocytes and monocytes) (fig. A and D); and for creatine kinase a concentration increase was observed in the samples 1 and 4 because the athletes had an important physical wear due to the increase of the training intensity in their preparation process for competition. All the variables analyzed in the study presented a high significance difference (P<0.1) among the samples; the creatine kinase, urea and neutrophils during the post competition phase (samples 6 and 7) showed a high significant value followed by a return to normal level values in sample 8 and 9 (fig. A, B, and C). The lymphocytes, eosinophilis, monocytes and basophilis showed a contrary behavior to what mentioned before, when the triathlon competition was over, the concentration of the analyzed cells diminished on a high significance way, and it recovered in the week after competition (fig. A). The creatine kinase, urea and immune response values reflected changes after performing an exhausting physical activity followed by a recovery to basal values after a week period, which represents an elevation or diminishment towards the physiological boundaries of training. It is important to point that the results presented in this study were an average; however it is also important to mention that in individual way each athlete showed a different response to training, concluding that an integral and personal physical preparation is strictly necessary in this discipline to avoid any overtraining risk, muscle skeletal injuries and myocardial damage.
Acute effects of static stretching exercises on short-distance flutter kicking time in child swimmers
Authors: Agopyan, Ani; Bozdogan, Fatma Seda; Tokin, Demet; Yetgin, Meral Kucuk; Guler, Cigil Gun

A computer-based observational analysis of physical education teachers and youth sport coaches pedagogic behaviour
Authors: Roberts, Simon J.; Fairclough, Stuart J.; Ryrie, Gus; Sharpe, Lewis

Physiological responses and match analysis of Muay Thai fighting
Authors: Cappai, Ivo; Pierantozzi, Emanuela; Tam, Enrico; Tocco, Filippo; Angius, Luca; Milia, Raffaele; Squatrito, Salvatore; Concu, Alberto; Crisafulli, Antonio

A Statistical Analysis of Tackling Performance during International Rugby Union Matches from 2011
Author: van Rooyen, Michele K.

Game movements and player performance in the Australian Football League
Authors: Hiscock, Daniel; Dawson, Brian; Heasman, Jarryd; Peeling, Peter

The effect of artificial side wind on the serve of competitive tennis players
Authors: Mendes, Pedro C.; Dias, Gonçalo; Mendes, Rui; Martins, Fernando M.L.; Couceiro, Micael S.; Araújo, Duarte

Relative age effect in Brazilian soccer players: a historical analysis
Authors: Costa, Israel Teoldo Da; Albuquerque, Maicon R.; Garganta, Júlio

The Dynamics of Psychological Momentum: A Quantitative Study in Natural Sport Situations
Authors: Bński, Walid; Den Hartigh, Ruud J.R.; Bakker, Frank C.; Gemignon, Christophe

Analysis of the effect of alternating home and away field advantage during the Six Nations Rugby
POST 1.4 SYSTEMS: (CHAIRS – Peter O’Donoghue & Arnold Baca)

POST 1.4.1 Use of barcode scanning for notational analysis
Donald B. Buchanan, David P. Cook & P. John Seeley (UK)

POST 1.4.2 An analysis of navigation patterns in rowing
Alessandro Pezzoli, Antonio Baldacci, Alda Cama, Marcello Faina, Dario Dalla Vedova, Maurizio Besi, Giuseppe Vercelli, Andrea Boscolo, Marco Dalessandro & Elena Cristofori (Italy)

POST 1.4.3 Predicting sports results using regression and neural models
Adam Maszczyk, Arkadiusz Stanula, Adam Zając & Robert Rocznioik (Poland)

POST 1.4.4 Comparing results of biomechanical analyses of raw data determined using AutoCAD software with those determined by AutoMatlab software for a number of athletic performances
Abi R. Al-bakri & Saadallah A. Rashid (Iraq)

POST 1.4.5 The use of taxonomic tools to analyse national team ice hockey game play
Robert Rocznioik, Adam Maszczyk, Arkadiusz Stanula, Przemysław Pietraszewski & Miłosz Czuba (Poland)

POST 1.4.6 Feedback technology in performance analysis
Lucy A. Holmes (UK)

POST 1.4.7 Analysis of the factors of yield in professional basketball applied to an ACB equipment
Marcelo Alejandro Jove Tossi, Maria del Mar Silvestre García, Alfonso Penichet Tomás, Jose Manuel Jimenez Olmedo, Eliseo Cabrera Andreu, Concepción Suarez Llorca, Federico Carreres Ponsoda, Carbonell Martinez & Antonio Jose (Spain)

POST 1.4.8 Using kinematic measures to predict post flight time in the women’s artistic gymnastics straight twisting Yurchenko vault
Rebecca Edginton (UK)

POST 1.4.9 Non-linear methods to analyze variability of indoor pedaling kinematics
Juan-Carlos Quintana-Duque (Germany)

POST 1.4.10 The accuracy of judging compared with objective computerised analysis in trampolining
Polly E. Johns & James W. Brouner (UK)

POST 1.5 SPORT SCIENCE & MEDICINE: (CHAIRS – Peter O’Donoghue & Arnold Baca)

POST 1.5.1 A comparison of lower limb strength and static balance in elite gymnasts and wrestlers with non-athletes
M. Reza Bahadoran, Yasser Ghasemzadeh & Tayebeh Soleimani (Iran)

POST 1.5.2 The relationships between physical readiness and cardiovascular risk factors
Marjeta Mišigoj-Duraković, Daniel Bok, Dražan Dizdar, Zijad Duraković, Maroje Sorić, Igor Jukić & Dario Matika (Croatia)

POST 1.5.3 Biological markers in the pre-competition and competition phases of triathlon
Blanca R. Rangel-Colmenero, Germán Hernández-Cruz, Fernando A. Ochoa-Ahmed, Adrián Rosas-Taraco, Hugo Zuazua-Aguirre & Oscar Salas-Fraile (México)