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Genetic and biochemical markers in physical exercise assessment

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An excessive physical activity could stress the organism determining unbalanced hormonal orders that can negatively affect the state of optimal health and therefore the sporting output. In particular during physical exercise the free salivary Cortisol concentration increases with the intensity of the exercise followed by an increase of the free Testosterone.

On this basis, there is the possibility the determine if the program of preset physical exercise evokes an abnormal reaction of adaptation of the organism.

Since physical exercise and athletic performance are strongly related to individual genetic traits, in this study we evaluated the possibility of customize the athletic training on the basis both of genetic and of levels of salivary markers involved in physical stress.

Eighteen male gymnasts were genotyped for the following sport involved gene polymorphisms: Angiotensin Converting Enzyme (ACE - I/D), α-actinin 3 (ACTN3 - RR/RX) and Vitamin D Receptor (VDR - BsmI, FokI, TaqI, ApaI). Salivary levels of Cortisol and free Testosterone were measured before and after a standard training session by saliva tests (Grifols, Italy).

From our results emerged the possibility of planning the training session avoiding a stress related overtraining and, at the same time, adjusting the athletic training on the basis of individual genetic profile.

Keywords: Cortisol, testosterone, genetics, physical training.