PROJECT REVIEW

"Isotope ration mass spectrometric (GC-C-IRMS) analytical strategies from confirmation to application in the ABP"

Dr. X. de la Torre (Laboratorio Antidoping FMSI, Italy)

The detection of pseudoendogenous steroids is based on the alterations of the parameters of the steroid profile included in the steroid module of the Athletes's Biological Passport (ABP). A Bayesian statistical inference approach allows fixing the boundaries for the ABP parameters of a given individual based on the previous data collected. In the case of a suspicious sequence of data or data outside the population based ranges when previous values are not available, a specific confirmatory method based on isotope ratio mass spectrometry (GC-C-IRMS) is mandatorily applied to the suspicious sample to disclose the synthetic from endogenous origin of the steroids detected. The current approach, although scientifically valid, has some limitations: (1) delay in taking appropriate decisions by the results management authorities (RMA) if the first value of the sequence is abnormal since the model needs the collection of additional samples to detect it; (2) ineffective for those athletes not tested with some frequency; (3) unable to detect low dosages with physiological effect.

In addition, new pharmaceutical formulations of synthetic steroids are not easily detectable by GC-C-IRMS if isotopic analyses of additional samples of the athlete are not performed. The aim of this study is to expand the use of IRMS at a screening level for those disciplines at higher risk of pseudoendogenous steroids abuse, simplifying the current confirmatory procedure. This would allow reducing the time of evaluating an abuse of pseudoendogenous steroids including those athletes less frequently tested, detecting lower dosages of administrations and for a longer period of time and finally being able to detect those preparations not currently detectable by the longitudinal evaluation of the IRMS data since these data would be now available.