Evaluation of the Urinary Excretion Profile of Luteinizing Hormone in Brazilian Athletes

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Introduction: Luteinizing hormone (LH) can be used by athletes as an alternative way to take illicit advantage of androgenic effects, since it stimulates the secretion of testosterone. Therefore, LH is included in the World Anti-Doping Agency (WADA) Prohibited List in the class of peptide hormones, whose use is illegal for male athletes. Thus, the objectives of this study were: (i) to validate the quantitative method of detection of LH in urine by IMMULITE\textsuperscript{®} immunoassay system, according to the required criteria by WADA, (ii) to evaluate the stability of LH in urine in different storage conditions, (iii) to evaluate the urinary excretion profile of LH of Brazilian athletes, aiming to establish a reference interval for LH.

Material and Methods: The urinary LH was quantified by IMMULITE\textsuperscript{®} immunoassay system (Siemens). The validation process evaluated specificity, linearity, precision, limit of quantification, matrix interference, recovery and carryover. The stability of LH was evaluated at room temperature, 4 °C and -20 °C, after 10, 30 and 40 days of storage, and also after three cycles of freezing and thawing. In order to evaluate the urinary excretion profile of LH, 598 urine samples from male athletes were analyzed. Results and Discussion: The validation results confirmed that the method of quantification of LH in urine matrix by IMMULITE\textsuperscript{®} system meets the criteria established by WADA. The hormone was stable at 4 °C and -20 °C for at least 40 days and for 10 days at room temperature, and was unstable only after the second cycle of freezing and thawing. The reference interval for urinary LH concentration was set in 1.7 to 27.3 mIU/mL. Conclusions: These results indicated that the assay is suitable to the application in doping control analysis, and samples with higher values than 27.3 mIU/mL must be investigated about a possible abuse of LH.

Keywords: Doping Control, Endogenous Profile, IMMULITE\textsuperscript{®} assay, Luteinizing Hormone, Urine Analysis.