Collection Methods and Measurement of Salivary Markers in Exercise


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Introduction: Salivary markers of training status represent an attractive alternative to assess the biological effects of training. Saliva secretion is under strong autonomic neuronal control and thus regulated by parasympathetic and sympathetic nerve fibers that are the effector arms of reflexes activated predominantly by taste and chewing.

Objectives: This study compared the salivary secretion rates and flow rate of salivary markers in response to exhaustive, incremental exercise test in both stimulated and unstimulated sampling methods.

Materials and Methods: Twelve healthy young men (aged 23.7±4 years) performed a maximal progressive test in cycle ergometer. Samples of saliva were collected (1 min) by passive drooling (UnS) and mechanical stimulation by chewing on a cotton swab (S) before and after each test. After a warm-up of five minutes at a self-selected cadence, the subjects pedaled until volitional exhaustion with 45W increases every two minutes at a cadence of 90 rpm. Blood pressure and heart rate were monitored throughout the test. The concentration of total protein (TP) was determined by the Bradford method. Salivary glucose and lactate were determined by an enzyme immunoassay. Cortisol was determined by enzyme immunoassay. Salivary Alfa amylase (sAA) concentration was determined by means of western blotting. Nitric oxide (NO) was determined as nitrate formed using the Griess reaction.

Results: No difference was observed in salivary flow rate. The amount of saliva collected was higher in S before the test (1.84 ml/min) but not after (1.35 ml/min). The concentration of lactate, TP, cortisol and NO was not different between methods. The salivary protein profile showed differences in polypeptides (P54, P17) according to the collection method. sAA was higher in the S only after the test (UnSA 11258 pixel density).

Conclusion: Our data suggests that collecting saliva by mechanical stimulation allows for simpler and better standardization due to saliva flow and comparability of flow dependent components in exercise.

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