

Method Validation of Testosterone Assays in Samples from Resistance Trained Males

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There are several reasons for researchers to investigate different methods for measuring testosterone including; hypogonadism, decreasing testosterone levels due to age, drug testing in athletes, gender differences, and responses to resistance exercises. However there has been little insight as to how the different methods correlate with the others.

PURPOSE: To investigate if saliva testosterone (T) testing methods could be validated when compared to clinically used serum methodology. **METHODS:** The samples were obtained from eleven healthy college aged males who underwent a 6-week resistance training protocol. Samples were taken before participants began the study, at the 3-week mid point, and at 6-weeks when the study concluded. Equilibrium dialysis was performed on the serum samples before they were extracted with methyl-*tert*-butyl ether (MTBE) for purification and then analyzed by liquid chromatography-tandem mass spectrometry (LC-MS/MS). The saliva samples were only extracted with the MTBE before being analyzed by LC-MS/MS. **RESULTS:** Plasma free testosterone ($m_{\text{plasma}} = 2.016 \pm 1.025$ ng/mL) was found to be significantly higher than salivary calculated free testosterone ($m_{\text{saliva}} = 0.009 \pm 0.004$ ng/ml, $p < 0.000$). When linear regression was performed a significant positive correlation between the methods was found ($R^2 = 0.245$, $p = 0.001$). **CONCLUSION:** It appears that from the correlation found, saliva and plasma testosterone levels are significantly correlated. This was expected because even though there was a difference in the values with the different methodologies, the amount in which the testosterone levels changed between testing points was associated. From the promising data found coupled with the limitations, further investigation is needed to draw further conclusion between the methods.