Key Summary of Conference Abstract

Development and validation of a self-collection blood test for athletic assessment of hormones

Background

• Changes in blood levels of some hormones have been observed in athletes during periods of intense training.\(^1\)\(^2\)
• In particular, elevated cortisol levels and low testosterone levels have been shown to be indicative of overtraining and a decline in performance.\(^3\)
• Routine assessment of blood levels of these hormones during training may be useful for athletes and coaches.
• However, the need for blood samples to be collected by a medical professional may limit the usefulness of such an approach.
• **Objective:** The investigators developed and validated a self-collected microspecimen blood test for accurate detection of cortisol and testosterone hormones in athletes.

Methods

• The study population included 46 Division I athletes, including 16 men and 30 women, ranging in age from 18 to 22 years.
• Fingerstick microspecimens (about 20 μL) and venous blood samples (about 5 mL) were collected.
• Fingerstick specimens were analyzed for total cortisol and testosterone using a newly developed microspecimen liquid chromatography-tandem mass spectrometry (LC-MS/MS) assay optimized for small specimen volumes.
• Venous blood samples were analyzed for the 2 hormones using both the microspecimen LC-MS/MS assay and a standard LC-MS/MS assay.
• Agreement between the results of the microspecimen and standard LC-MS/MS assays was evaluated using Deming regression and Pearson correlation analyses.

Results

• Results from the fingerstick microspecimen LC-MS/MS assay correlated well with those from the venipuncture standard LC-MS/MS assay for both total cortisol \(r=0.92; P<0.0001\) and testosterone \(r=0.99; P<0.0001\).
• Results from the fingerstick microspecimen LC-MS/MS assay correlated well with those from the venipuncture microspecimen LC-MS/MS assay for both total cortisol \(r=0.96; P<0.0001\) and testosterone \(r=0.99; P<0.0001\).

Conclusions

• Cortisol and testosterone levels determined by a microspecimen LC-MS/MS assay are in good agreement with levels determined by a standard LC-MS/MS assay.
• Self-collection of blood samples may enhance the ability of athletes and their coaches to assess hormone levels during periods of training.

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**Authors**

Maren S Fragala,\(^1\) Scott M Goldman,\(^1\) Caixia Bi,\(^1\) Mildred M Goldman,\(^1\) Shawn M Arent,\(^2\) Alan J Walker,\(^2\) Nigel J Clarke\(^1\)

**Affiliations**

\(^1\) Quest Diagnostics, Madison, NJ
\(^2\) Rutgers, The State University of New Jersey, New Brunswick, NJ

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**Webpage**


**References**