Assessment of Urinary F2-Isoprostanes in Experimental and Clinical Studies: Mass Spectrometry Versus ELISA

To the Editor:

Ojeda and colleagues reported that oxidative stress renal markers contribute to sex differences in blood pressure in adult growth-restricted offspring rats. The antibody used in the ELISA kit used by Ojeda et al is specific for 15(S)-8-iso–PGF2α, one of 64 possible F2-isoprostanes. At first glance, ELISA and gas chromatography-mass spectrometry (GC-MS) seem to correlate (Figure, A); however, the Bland-Altman method reveals enormous differences and systematic errors in the ELISA method (Figure, B). Lack of analytically satisfactory agreement applies to another commercially available 15(S)-8-iso–PGF2α ELISA kit (http://www.caymanchem.com/pdfs/516351.pdf).

15(S)-8-iso–PGF2α is excreted in the urine in free and conjugated forms (Figure C). The lack of appreciable biological variation in urinary excretion in humans and rats (58±16 pg/mg creatinine; 1 female, 4 male) and the manifold higher reported 15(S)-8-iso–PGF2α levels reveal serious analytic shortcomings with the use of 15(S)-8-iso–PGF2α ELISA kits. This may compromise the scientific outcome.

Inclusion of clean-up procedures is likely to improve the analytic performance of ELISA kits. Yet, reliable assessment of 15(S)-8-iso–PGF2α in experimental and clinical study samples is best accomplished by tandem mass spectrometry-based methods. Therefore, a modified ELISA protocol is likely to improve the analytic performance of ELISA kits.

Disclosures

None.

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Hypertension. 2012;60:e14; originally published online July 2, 2012;
doi: 10.1161/HYPERTENSIONAHA.112.199315

Hypertension is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0194-911X. Online ISSN: 1524-4563

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