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Immulite vs Scantibodies IRMA Plasma ACTH Assay

To the Editor:

The 2-site IRMA assay for adrenocorticotrophic hormone (ACTH),1 as produced by Nichols Institute Diagnostics, was considered the gold standard in the US (1). This assay is no longer available. It was recently demonstrated that a manual IRMA ACTH assay produced by Scantibodies yielded results equivalent to those obtained with the Nichols Institute Diagnostics assay (2). We have observed that the results from the College of American Pathologists (CAP) Proficiency Survey samples for ACTH using the Scantibodies IRMA yielded higher results than those from the Immulite platform (Siemens), which is the assay used by the majority of clinical laboratories. We thought this difference could be attributable to either inappropriate freeze-thawing of the CAP proficiency samples by a large number of reporting laboratories, a procedure that is expressly proscribed by CAP, or that the Immulite platform yields lower plasma ACTH results than the Scantibodies IRMA.

We analyzed 24 plasma samples, each from a different patient, selected to cover the critical range of plasma ACTH from 2.0–26.2 pmol/L (9–118 pg/mL). First, we evaluated the effect of freeze-thaw on EDTA plasma samples and found no significant decrease using the Scantibodies IRMA results equivalent to those obtained with the Nichols Institute Diagnostics assay (2). We have observed that the results from the Scantibodies IRMA [0.07% (95% CI 6.8%)]. However, freeze-thawing of 3 TM-A 2008 CAP proficiency samples resulted in an 18%–21% decrease in ACTH concentrations measured with the Scantibodies IRMA [original results were 18.7–31.6 pmol/L (84–142 pg/mL)].

We then measured plasma ACTH in split samples, each sample from a different patient, with the Scantibodies IRMA vs Immulite 2000 referred to ARUP Laboratories (Salt Lake City, UT). Fig. 1 shows the Bland-Altman plot of these findings (3). On average, the Immulite results were −5.7 pmol/L (−25.7 pg/mL) (SD 4.0 pmol/L [18.1 pg/mL]; 95% CI 1.7 pmol/L [7.8 pg/mL]) compared to the Scantibodies results. This effect was not apparent in an

References
1. Nonstandard abbreviations: ACTH, adrenocorticotropic hormone; CAP, College of American Pathologists.
additional 5 samples from 5 different patients with high results ranging from 52–278 pmol/L (234–1253 pg/mL).

It is imperative that CAP Survey samples for ACTH be assayed immediately after reconstitution and without freezing, as instructed by CAP. When averaged over different patients, Siemens Immulite ACTH results are typically lower than those from the Scantibodies IRMA, and are probably typically lower than historical Nichols Institute Diagnostics values in the clinically significant critical range of plasma ACTH of 2.0–26.2 pmol/L (9–118 pg/mL).

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References


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