Analytical validation of the Liaison hGH assay (DiaSorin).

Keutgens A., Ho G., Cavalier E.
Department of Clinical Chemistry
University of Liège, CHU de Liège, Liège, Belgium.

Introduction

Determination of the circulating growth hormone (GH) concentrations is an important tool in the diagnosis and monitoring of different pathologies, such as acromegaly and GH deficiency. However, GH determination is challenging. Indeed, the discrepancies observed between the different commercially available immunoassays represent a critical problem and have led to an important confusion in the interpretation of the GH results. This can be explained, on one hand, by the heterogeneity of the different circulating GH fragments and on the fact that these fragments are not necessarily recognized to the same extent by these kits. On the other hand, different International Standards have historically been used to calibrate GH kits. Finally, the analytical performances of these kits have generally been poorly described.
Routinely, we use the Liaison hGH (DiaSorin, Saluggia, Italy) to perform GH determination. The aim of our study was to perform the analytical validation of this kit.

Materials and Methods

The Liaison hGh is a chemiluminescent method that uses a pair a monoclonal antibodies directed against the 22 kDa form of the GH peptide. The kit is calibrated against the NIBSC 98/154 International Standard (IS). We evaluated the precision with a modified protocol based on CLSI Guideline EP-5A2 : 7 serum pools were assayed three times a day on 5 consecutive days on two different automates. We established the limit of detection and of quantification, the measurement uncertainty, the accuracy profile and the β-expectation limits of the method. We settled the β-expectation tolerance limits with β=0.95 and considered the method as valid if each future measurements of the same level of concentration has a probability of 95% to fall in the ±20% accepted limits of accuracy.

Results

Repeatability did not exceed 5% at the studied levels (1.47 – 15.12 ng/ml). The limit of detection was found to be at 0.04 ng/mL and the limit of quantification at 0.06 ng/mL. The mean recovery of the IS was 91.0± 13.7%. Measurement uncertainty was comprised between 32.96% (at 0.06 ng/mL) and 5.77% (at 18.43 ng/mL). The accuracy profile built with our predictive tolerance interval method shows that, on average, 95% of the future results that will be generated with this method will be included in the computed tolerance interval of ±20% between 0.20 and 18 ng/mL.

Discussion and Conclusion

Determination of GH remains challenging. Our results, based on an innovative validation approach have shown that the Liaison hGH method is very robust, as 95% of the future results that will be obtained with this method in the range 0.20 – 18 ng/mL will be comprised in an interval of ±20%. Moreover, this method is well calibrated against the NIBSC 98/154 IS, which is the actual reference standard for GH kits. Our approach should be extended to the other GH assays to evaluate their performance. This would be a preliminary starting point to a multicentre study, designed to re-evaluate the different clinical cut-offs used to diagnose the GH-associated pathologies.