
Poster

[P27-8] P27-8: Assay and monitoring

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Wed. Sep 27, 2017 12:30 PM - 1:30 PM Annex Hall (1F)

(Wed. Sep 27, 2017 12:30 PM - 1:30 PM Annex Hall)

[P27-8-5] Clinical monitoring of 25-hydroxyvitamin D₂ and 25-hydroxyvitamin D₃ by LC-MS/MS

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Keywords: 25-hydroxyvitamin D, Clinical Monitoring, LC-MS/MS

Background

Vitamin D is a lipid-soluble prohormone, which has long been known to play a significant role in bone development by promoting calcium absorption in the gut and bone mineralization. Vitamin D deficiency, a growing health concern worldwide, leads to rickets in children and osteomalacia in adults, and it raises the risk for osteoporosis. Vitamin D₂ (ergocalciferol) and D₃ (cholecalciferol) are two different forms of vitamin D, which present similar physiological effect in body. Vitamin D is converted to 25-hydroxyvitamin D in the liver, which acts as the primary body storage and transport form of vitamin D. It is widely acknowledged that circulating 25-hydroxyvitamin D is the best indicator of vitamin D status, as it has a long half-life and unaffected by strict homeostatic control. Herein, we developed an analytical method for clinically monitoring 25-hydroxyvitamin D₂ and 25-hydroxyvitamin D₃ in human serum by LC-MS/MS.

Methods

Sample preparation was procedure by one-step protein precipitation with methanol. Separation was achieved via Shimadzu Nexera UHPLC with Shim-pack XR-C8 (2.0 mm I.D. ×50 mm L., 2.2 μm) column, and 25-hydroxyvitamin D quantification was accomplished by the triple quadrupole mass spectrometer Shimadzu LCMS-8045.

Results

The linear dynamic range of 25-hydroxyvitamin D₂/D₃ was from 5 to 500 ng/mL. CVs of within-day and between-day were lower than 4.6% and 6.9%. And the accuracy ranging from 86.7-111.8%.

Conclusions

This method provides reliable and accurate measurement of 25-hydroxyvitamin D for use in clinical practice.