Poster

[P27-5] P27-5: Cardiovascular drugs (2)

Chair: David A. Joyce, Australia

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[P27-5-7] Determination of homocysteine in human plasma / serum using LC-MS8060

Changkun Li (Shimadzu (China) CO., LTD.)

Keywords: Homocysteine, Plasma, LCMS-8060

Background

Homocysteine (Hcy) is the intermediate for methionine metabolism. It is biosynthesized from methionine and a homologue of the amino acid cysteine, differing by an additional methylene bridge (-CH2-). An enhanced blood homocysteine concentration is a medical condition which is termed as hyperhomocysteinemia. It is considered as an independent risk factor for degenerative
vascular diseases, which may lead to heart attack, stroke and thromboses.

Methods

A combined system of Shimadzu LC-30A and triple quadrupole mass spectrometer LCMS-8060 was used in the experiment. Homocysteine was measured using the commercially available ClinMass® Complete Kit for total homocysteine in Plasma and Serum. Calibrators, control samples were provided by the kit. The samples are spiked with an internal standard (50 μl), the bound homocysteine is released (reduction) and after a precipitation step. The mass spectrometer was operated in the positive mode. Quantification was performed using MRM-Mode of the transitions of m/z 136.2 - m/z 90.2. The mobile phase was acetonitrile(0.1% formic) and water(0.1% formic),a Discovery HS F5-3 (2.1 mmI.D. ×150 mmL, 3 m) column was used for analysis samples.

Results

Using the LCMS-8060 analysis of Homocysteine in Plasma and Serum can be performed quite easily. The calibration curves showed good linearity within the range of 0.794~6.86 mg/L with the correlation coefficient not less than 0.9996. The Method Detection Limit (MDL) and Method Quantification Limit (MQL) is 0.26 ng/mL and 0.87 ng/mL respectively, and the accuracy of quality control samples are in the range of target value.

Conclusions

A selective and sensitive ultra-high performance liquid chromatography - triple quadrupole mass spectrometry (UHPLC-MS/MS) method was developed for the direct determination of homocysteine in human plasma/serum. This method showed good sensitivity and linearity in a clinically relevant concentration range, and suitable for detection of clinical samples.