Poster

[P27-7] P27-7: Assay

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[P27-7-9] LC-MS/MS simultaneously analyze 12 kinds of TDM compounds

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Background

In the TDM (therapeutic drug monitoring) market of present China, The immunoassay method is mainstream and the HPLC method is also used. However, the immunoassay method always has to purchase and/or stock dozens of reagent kits for each targets depend on diseases. And the therapeutic concentration range of these compounds, typically narrow, requires careful monitoring from serum, plasma and whole blood. In this regard, LC-MS/MS method are expected to replace the HPLC method, because LC-MS/MS has high sensitivity and wide dynamic range which are required by recent TDM analysis. In these experiments attempt to development of simultaneous analytical method about 12 different kinds of TDM compounds using LC-MS/MS.

Methods

The LCMS-8060 triple quadrupole mass spectrometer with Nexera UHPLC system (Shimadzu Corporation, Kyoto, JAPAN) are used. The analytical conditions for each TDM compounds were optimized by the two MRM transitions to quantify and qualify compound measurement. 12 kinds of TDM standards spiked serum were used to make calibration curves. Simple method of protein removal was used for pretreatment.

Results

The combination of simple pretreatment method and LC-MS/MS analytical method has been established in this research. These method contain the simultaneous analysis of 12 different kinds of TDM compounds (mostly using in China) including anti-epileptic drugs, immune-suppressants, anti-cancer agents, anti-bacterial agents and asthma drugs etc. Calibration curves of all TDM compounds showed excellent linearity, accuracy and sensitivity using the same pretreatment and LCMS analytical conditions. Additionally, recovery of each compound was very stable, and area reproducibility at the lowest calibration level of each compound was less than 20%. Comparing with internal standard method, the result confirms that using external standard method to monitor TDM compounds is feasible.

Conclusions

The simultaneous analysis method using LC-MS/MS is developed. It is shown good sensitivity and suitability for qualitative and quantitative analysis of 12 kinds of TDM compounds in serum.