
Poster

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

Chair: David A. Joyce, Australia

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[P27-5-4] Screening and quantification method for antihypertensive agents using LC-MS/MS: a valuable tool for medication adherence assessment

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Background

Recently, LC-MS/MS has gained interest for compound screening in toxicology and medication adherence assessment. Therefore, we explored the use of LC-MS/MS for screening and quantification of antihypertensive agents in serum using LC-MS/MS in patients with resistant hypertension.

Methods

A fast and efficient sample preparation was performed by protein precipitation and samples were analyzed using LC-MS/MS. 47 compounds and metabolites were included in the screening assay covering over 95% of antihypertensive agents available in Europe. Compounds were quantified using selected reaction monitoring transitions (SRM) and were confirmed for qualification by a second SRM transitions. The limit of qualification (LOD) was defined by a signal-to-noise ratio over 3 times combined with a maximum deviation of 20% for quantifier/qualifier ratio. After analytical validation samples drawn from 98 patients with resistant hypertension were analyzed. Patients and physicians were unaware of adherence assessment.

Results

Using the developed method, the LOD was for 36% of the compounds between 0.001 - 0.05 g/L, 51% was between 0.1g/L - 1 g/L and 13% was between 5 g/L - 20g/L. All detection limits were at least equal to the therapeutic serum concentrations (TSC) and for 90% of the compounds the detection limits were 5 to 1000 times lower compared to the TSC. Analysis of patients samples showed that no or extremely low suprathreshold concentrations were retrieved of at least half of prescribed antihypertensive medication in 31 (32%) patients. The median number of antihypertensive agents detected was two while the median number prescribed was four.

Conclusions

A screening and quantification for 47 antihypertensive agents in serum assay using LC-MS/MS was successfully developed fulfilling predetermined qualification and quantification validation requirements. A high percentage of patients proved totally or partially noncompliant. We conclude that serum screening for antihypertensive drugs with subsequent quantification with LC-MS/MS is a valuable tool for assessment of adherence in patients with therapy-resistant hypertension.

