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Abstract Book

Monday

Novel Aspect
This unique method enables rapid analysis of several different groups of sweeteners in human urine in one run. It may serve to identify biomarkers in nutritional research.

References

1. LogueC., Dowey L. R., Strain J. J., Verhagen H., McClean S., Gallagher A. M., Journal of Agricultural and Food Chemistry, 65, 4516-4525 (2017).
2. WilsonS. A., Wilkinson K., Crews H. M., DaviesA. M., Dick C. S., Dumsday V. L., Food Additives & Contaminants, 16, 227-238 (1999).
3. Bekersky D., Colburn W. A., Analytical Letters, 13, 805-816 (1980).
4. Licea-Perez H., Jonnotula V., Zohrabian S., Karlinsey M., Analytical Methods, 8, 3023-3033 (2016).
5. CasalsI., Reixach M., Amat J., Fuentes M., Serra-Majem L., Journal of Chromatography A, 750, 397-402 (1996).

MP-150 / PHARMACOKINETICS AND BIOAVAILABILITY OF DIFFERENT ACETYLSALICYLIC ACID FORMULATIONS ASSESSED BY LIQUID CHROMATOGRAPHY-TANDEM MASS SPECTROMETRY IN HEALTHY SUBJECTS

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Keywords: pharmacokinetics, LC-MS/MS, aspirin, enteric-coated formulation

Introduction
Low-dose acetylsalicylic acid (ASA, 100 mg/die) is used in thromboprophylaxis. Enteric-coated formulation (EC-ASA) is commonly used for its lower risk of side effects. Some patients on EC-ASA do not respond appropriately and recent studies showed that poor responsiveness is more frequent with EC-ASA [1]. Aim of this study was to validate a method useful to study the pharmacokinetics (PK) of ASA in healthy subjects treated with two different aspirin formulations.

Methods
Liquid chromatography tandem mass spectrometry (LC-MS/MS) technique was used for determination of ASA and salicylic acid (SA) in human plasma, using the respective deuterated isotopomers as internal standards (ASA-d_4, SA-d_4). The method was validated according to FDA guidelines and was applied to evaluate the PK of ASA and SA at different times (30 min-24 h) in healthy subjects (n=11) treated for 1 week with 100 mg of EC-ASA or plain Aspirin (plain-ASA).

Results
Analytes and internal standards were extracted from human plasma by protein. The compounds were separated on a reverse-phase column with an isocratic mobile phase. Compounds parameter were optimized to have the higher signal to noise ratio in negative multiple reaction mode. Ion transition recorded were 179→137 for ASA, 183→141 for ASA-d4, 137→93 for SA and 137→141 for SA-d4. The calibration curves were linear (r2≥0.99) over the concentration range of 20-2000 ng/mL for ASA and 20-8000 ng/mL for SA. LOQ was 20 ng/mL for both.
Plasma AU Cafter EC-ASA administration was 702(604-881) ng h/mL (median, 25%-75% CI). tmax occurred between 2-8 hours after intake. Two subjects did not show ASA absorption within the observation period confirmed by SA trend. PK of plain-ASA showed AUC of 823 (635-1013) ng h/mL and all subjects absorbed the drug with tmax between 0.5-1 h.

Conclusions
The developed method allowed to study the analytical fate of aspirin “in vivo” by comparing two different

ASA formulations. Coated formulation showed a variable behavior and in 2 subjects absorption seemed impaired. On the contrary using plain-ASA variation is reduced and all subjects absorbed efficiently the drug. Causes of inadequate response to ASA may be related to different gastro-intestinal availability of coated formulation.

Novel Aspect

Availability of a validated method is pivotal to study ASA absorption and metabolism in different cohorts of patients known to have poor pharmacodynamics responses to the drug.

References

1. Grosser T, Fries S, Lawson JA, Kapoor SC, Grant GR, FitzGerald GA, Circulation , 127, 377-85 (2013).

MP-151 / WHICH LC-MS/MS PLATFORM IS MOST APPROPRIATE FOR THE QUANTITATIVE ANALYSIS OF STEROIDS IN URINE, SERUM AND ORAL FLUID FOR CLINICAL RESEARCH

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Keywords: steroids, serum, triple quadrupole, liquid-liquid extraction

Introduction

Steroid hormones control many physiological aspects in our body. A robust, sensitive, accurate and specific LC/MS/MS analytical method has been developed for the quantitation of 19 steroids in serum. A simple liquid-liquid extraction sample preparation allows achieving the required sensitivity. This research study was carried out to evaluate which LC-MS/MS instrument is best suited to characterize and quantitate the steroids in serum.

Methods

Thermo Scientific™ TSQ Fortis™, Thermo Scientific™ TSQ Quantis™, and Thermo Scientific™ TSQ Altis™ tandem mass spectrometers and a Thermo Scientific™ Vanquish™ HPLC system were utilized. A 200 µL serum sample was used and a Thermo Scientific™ Accucore™ C18 column achieved baseline chromatographic separation. Quantitative analysis was performed using SRM scan in positive and negative mode. Accuracy of the analytical method was verified using reference samples.

Results

Good linearity and reproducibility were obtained with the concentration range from 10 pg/ml to 1000 ng/ml for the steroids with a coefficient of determination >0.995 for all mass spectrometer platforms. The lower limit of detection (LLOD) and lower limit of quantitation (LLOQ) were determined. Excellent reproducibility was observed for all platforms, being the %CV for each calibration point always < 10% for all steroids. The inter-assay precision was determined by extracting and quantifying three replicates of in-house control material resulting in %CV for the steroids of < 10% deviation from the targeted mean. The inter-assay precision was determined over three consecutive days and was found to have a %CV < 10% for each steroid within its respective linear range for the three levels of pooled serum sample control material respectively. The accuracy was determined by the analysis of in-house control material as the percentage deviation from the targeted mean. The results were < 10% for all levels in each matrix.

Conclusions

A sensitive, simple, specific and accurate liquid chromatography QQQ mass spectrometry analytical method was developed and verified for the measurement of 19 steroids in serum and applied to any Thermo Scientific™ tandem mass spectrometer platform. The sample preparation technique is quick and easily