Development of a High Resolution Accurate Mass Method for the Multiplexed Monitoring of Antiretroviral Agents in Human Serum

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ABSTRACT

OBJECTIVE

The objective of this study is to develop and validate a high resolution accurate mass spectrometry method for the qualitative detection of several common ARVs used in HIV management and prevention.

RESULTS

The analytical method was developed to detect the following ARV agents: zidovudine, lamivudine, abacavir, indinavir, saquinavir, amprenavir, ritonavir, atazanavir, nelfinavir, nevirapine, tipranavir, darunavir, lopinavir, emtricitabine, tenofovir, efavirenz, and doravirine. The method included one positive-mode and one negative-mode scan event with ultra-high resolution (100000 @ 1Hz) and one positive-mode scan event with high resolution (25000 @ 4Hz). All scan events were programmed for 100 msec maximum injection time and balanced ACG mass discrimination of 5 ppm. Further, the presence of an ARV was confirmed via fragmentation. Drug identification was determined based on accurate mass (discrimination of 5 ppm), presence of at least one characteristic fragment, and retention time. Fragment analysis was not possible for efavirenz identification of 15 ARV’s in a serum sample.

SUMMARY & CONCLUSIONS

Development of a high resolution accurate mass LC-MS/MS method for simultaneous identification of 15 ARVs in a serum sample.

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REFERENCES