K57 Analysis of Antipsychotic and Antidepressants in Whole Blood by LC/MS/MS

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After attending this presentation, attendees should have a more thorough understanding of the capabilities of screening for antipsychotic and antidepressants in whole blood by LC/MS/MS.

This presentation will impact the forensic science community by providing analytical information to members of the medical examiner toxicologist community and to individuals that may take an interest in the analysis of these types of compounds to determine their concentrations in whole blood.

The objective of this research was to develop an LC/MS/MS method for screening and confirmation of various antidepressant and antipsychotic drugs in whole blood. These types of compounds are consistently among the most commonly prescribed medications and as such can be routinely encountered in the performance of therapeutic drug monitoring or medical examiner toxicological examinations. The analysis of these types of drugs may be hampered by laborious extraction procedures, extended analytical analysis times, and even the need for multiple analyses. A generalized sample preparation and analysis method by HPLC tandem MS is presented.

This method describes the simultaneous analysis of more than ten antipsychotic, antidepressant, and structurally similar medications. Whole blood is subjected to protein precipitation. The corresponding supernatant was subsequently analyzed using reversed-phase HPLC with MS/MS detection. The column used was an Allure PFP Propyl from Restek Corporation. The mobile phase consisted of a binary mixture for a gradient. Mobile phase A was aqueous 1.0 mM ammonium acetate with 0.05% acetic acid. Mobile phase B was 95% Acetonitrile and 5% water with 1.0 mM am- monium acetate and 0.05% acetic acid. Detection was by single reaction monitoring for each compound. Confirmation was by multiple reaction monitoring of two transitions for each compound.

All of the analyzed antipsychotics, antidepressants and structural analogs were analyzed in a single method. The analytical run time was complete within 15 minutes. Detection limits of the individual drugs and their observed linear ranges are presented. Linear ranges for the drugs generally covered at least two orders of magnitude. The limits of detections for many the compounds allow for application of the method to monitoring therapeutic concentrations.

The method provides an accurate and reliable means for detection and confirmation of various antipsychotic and antidepressant drugs in a whole blood matrix. The use of a precipitation as a means of sample preparation is less laborious and more time effective than classical liquid-liquid or solid phase extraction. In addition the versatility associated with HPLC and tandem mass spectrometry makes it likely that addition drugs could be added to expand the scope of the analysis with few modifications.

Antipsychotics, Whole Blood, LC/MS/MS

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