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The promise of microsampling, delivered

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microsampling workshop at MSACL 2017

January 26, 2017 | 1:30 pm | Palm Springs, CA | Renaissance Hotel & Convention Center, Mojave Room

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Therapeutic Drug Monitoring of Disease Modifiers in Rheumatic Diseases: Implementation Using VAMS Collection Method

Thierry Dervieux, PharmD., PhD., DABCC, CSO & Medical Director, Exagen Diagnostics

Therapeutic drug monitoring (TDM) is recognized as important for dosing optimization of Methotrexate and hydroxychloroquine (MTX) therapy in rheumatoid arthritis (RA). We have developed and validated a clinical mass spectrometry method for quantitative determination of MTX polyglutamates and hydroxychloroquine from blood collected on volumetric absorptive microsampler (VAMS). MTX and HCQ levels from capillary blood were similar to those recovered from venous blood in vivo in patients with RA. A patient survey indicated that the majority of subjects would favor the collection of capillary blood on VAMS compared to blood collected by venipuncture.

Automated Method for the Sample Preparation and LC-MS/MS Analysis of Steroids in Dried Blood using Mitra Microsampling Devices

Julia Colletti, Scientist, Mass Spectrometry R&D, Quest Diagnostics

The Mitra Microsampling Device by Neoteryx is an alternative form of sample collection that utilizes the capability of acquiring a small volume of capillary blood and storing it in a dried state. Collection of capillary blood is achieved by piercing the skin with a lancet, then wicking the blood onto the device. The absorptive tip of the microsampler is designed to collect a fixed volume of biological sample, thus creating a reliable and precise means of specimen collection. The ease of collection and ability to ship samples in a dried state also lowers costs and improves patient experience.

An assay utilizing the 20 µL Mitra microsampler was developed to quantitate ten steroids in capillary blood. Samples were extracted and analyzed on an LC-MS/MS platform. The benefits of developing the method on these microsamplers include the ability to resolve the issue of assay bias caused by hematocrit. With dried blood spot cards, the hematocrit of a sample effects the dispersion of blood on the filter paper and, consequently, the amount of blood within a punch. Mitra microsamplers, however, are designed to absorb a fixed volume of blood, independent of hematocrit. The user is able to determine that 20 µL of blood has been absorbed onto the microsampler through visual confirmation (the entire tip is red), and the duration of time the tip is held to the surface of blood.

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The design of the Mitra Microsampler also permits the full automation of the assay on the Hamilton® STAR™ workstation. A method has been developed in which the STAR performs all liquid handling and mixing steps required in the workflow. The dried samples are loaded directly onto the STAR, which then prepares them for the extraction process. By utilizing the STAR, the throughput and reliability of the assay were improved.

The Mitra microsampler provides a means of specimen collection that minimizes sample preparation and is highly convenient. An accurate and reproducible assay was successfully developed using the microsamplers to monitor ten steroids in whole blood. The ease of collection and ability to store and ship at ambient temperatures also encourages at-home and remote specimen collection.