



K22 A Novel LC/MS Method for the Quantitation of Vardenafil

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After attending this presentation, attendees will learn an accurate and reliable method for the detection of vardenafil.

This presentation will impact the forensic community and/or humanity by providing the forensic community with an accurate and reliable method for the detection of vardenafil.

Vardenafil is an oral medication used for the treatment of erectile dysfunction. Vardenafil, when used properly, is relatively safe. However, vardenafil has been shown to potentiate the hypotensive effects of nitrates commonly employed in the treatment of certain heart conditions. Moreover, while vardenafil inhibits phosphodiesterase type 5 enzyme, it also has a high affinity for phosphodiesterase type 6 (PDE6), which is a retinal enzyme involved in phototransduction. The inhibition of PDE6 can result in the inability to discriminate between blue and green colors, resulting in a condition known as “blue tinge.” This blue-green impairment could cause problems in the execution of certain tasks. For example, this impairment could lead to a problematic situation for a pilot relying upon instruments during night flights or adverse conditions. During the investigation of aviation accidents, postmortem specimens from accident victims are submitted to the Federal Aviation Administration’s Civil Aerospace Medical Institute (CAMI) for toxicological analysis. As new medications are introduced to the market and are subsequently used by aviation accident victims, CAMI’s forensic toxicology laboratory is tasked with developing analytical methods for the determination of these compounds. This report presents a rapid and reliable method for the identification and quantitation of vardenafil in biological specimens using LC/MS/MS and MS/MS/MS. This procedure utilizes sildenafil-d₈, which is closely related to vardenafil, as an internal standard for more accurate and reliable quantitation. This method incorporates solid-phase extraction (SPE) and LC/MS/MS and MS/MS/MS utilizing an atmospheric pressure chemical ionization ion trap mass spectrometer in the positive chemical ionization mode. Using a common basic drug SPE procedure, the extraction recoveries for blood controls at 2, 20, and 200 ng/mL ranged from 94 – 97%. The limit of detection for vardenafil was determined to be 0.19 ng/mL. The linear dynamic range for this compound was 0.39 – 200 ng/mL. This novel analytical procedure proved to be simple, accurate, and robust for the identification and quantitation of vardenafil in biological specimens.

Vardenafil, LC/MS/MS, Aviation Death Investigation