



CHALLENGES AND MERITS OF DBS (DRIED BLOOD SPOT) ANALYSIS BY MASS SPECTROMETRY

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Abstract:

Dried Blood Spots (DBS) has been used in newborn screening for decades, but has also shown potential as a sampling technique in any remote sampling situation, and in fields such as therapeutic drug monitoring and in detection and quantification of disease markers. Through the introduction of advanced analytical techniques and improved throughput, the scope of dried blood spot testing utilizing mass spectrometric methods, has broadly expanded. Clinicians and researchers have become very enthusiastic about the prospective applications of dried blood spot based mass spectrometric applications. Analysts on the other hand face challenges of sensitivity, reproducibility and overall accuracy of dried blood spot quantification. This review aims to bring together these two facets to discuss the advantages and current challenges of non-newborn screening applications of dried blood spot quantification by mass spectrometry. DBS analysis using MS applications is now broadly applied, with drug monitoring for both therapeutic and toxicological analysis being the most extensively reported. Several parameters can affect the accuracy of DBS measurement and further bridge experiments are required to develop adjustment rules for comparability between dried blood spot measures and the equivalent serum/plasma values. Likewise, the establishment of independent reference intervals for dried blood spot sample matrix is required. It is predicted that with the inherent advantages of the alternative dried blood spot sampling technique compared to the classic plasma based strategies, in future micro-sampling based assays will certainly play a substantial role for analysis of biomarkers.

Keywords: Dried Blood Spots, mass spectrometry, non-newborn, challenges

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