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Liquid chromatography-tandem mass spectrometry increases the clinical outcome from the antimicrobial therapy used in intensive care units**Nahed El-Najjar**

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In the last years, liquid chromatography-tandem mass spectrometry (LC-MS/MS) has become the method of choice for therapeutic drug monitoring (TDM) of drugs used in critically ill patients. This is largely due to the high accuracy and fast delivery of the results obtained with LC-MS/MS which enables quick decision in dose adjustment increasing thus the clinical outcomes of treatments used in Intensive Care Units (ICU) patients. This is particularly of interest when it comes to the antibiotic therapy which is increasingly acknowledged to be frequently unsatisfactory. Inadequacy of the antibiotic therapy is due to the wide range of pathophysiological changes observed in critically ill patients, which impact the proper pharmacokinetic/pharmacodynamic profile of the antibiotics used. Even though the observed poor clinical outcome is mostly related to poor antibiotics exposure, which also increases the risk of acquiring bacterial resistance, dysfunction in kidney and liver, which are the major routes for drug elimination, result in an increased risk of the prompt onset of toxic drug concentration. Therefore, establishing reliable methods for TDM is of utmost importance. When it comes to be applied in routine analysis, analytical methods used for TDM should encompass the simultaneous analysis of different antibiotics widely used in ICU. Challenges encountered during method development as well as the successful application of LC-MS/MS methods for TDM of antibiotics in critically ill patients will be presented and discussed.

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