OPEN ACCESS Freely available online

Journal of Clinical Chemistry and Laboratory Medicine

Editorial

Importance of Therapeutic Drug Monitoring (TDM)

Yusuf Tutar*

Department of Basic Science and Biochemistry, University of Health Sciences, Sivas, Turkey

EDITORIAL NOTE

Therapeutic drug monitoring (TDM) is a form of blood test that determines the amount of certain medications in your system. It's done to ensure that the dose of medication you're taking is both safe and reliable. The majority of drugs can be dosed correctly without the need for further research. However, with certain medications, determining a dosage that offers enough medication to treat the disease without causing dangerous side effects can be difficult. TDM assists the doctor in determining whether you are receiving the correct dosage of your medication.

Therapeutic drug control includes assessing drug concentrations in plasma, serum, or blood. This knowledge is used to personalize dosage in order to keep medication doses within a target range. Since drug concentrations at the site of action cannot be calculated routinely, desired or adverse effects can correlate better with plasma or blood concentrations than dosage. Concentration measurements are a useful proxy for drug exposure for a few drugs, particularly if there is no easy or sensitive measure of effect.

Individualizing medication dosage is difficult when there is a wide inter-individual variation between dose and effect, such as when there is a large pharmacokinetic variation. This is especially important for drugs with a limited target range or pharmacokinetics that are concentration dependent. Similarly, for certain medications, differences within a person may occur over time for a variety of reasons, and therapeutic drug monitoring can be useful.

Steps for TDM

Several authors have established pharmacological characteristics of TDM drug candidates, which can be summarized as follows:

1. Because of substantial between-subject PK variability, which is difficult to predict based on individual patient characteristics, a standard dose can achieve a wide range of concentration levels in different patients.

2. PK stability is appropriate, and within-subject PK variability is restricted over time.

3. PD associations between concentration exposure and reaction and/or toxicity that is reliable.

4. In terms of between-subject PK variability, there is a narrow therapeutic margin.

5. Absence of readily assessable and open to dosage changes pharmacodynamics markers of therapeutic response and/or toxicity.

Different types of concentration exposure targets may be described, depending on which exposure parameter best predicts the therapeutic response: trough concentration is commonly used, for example, with antiepileptic, targeted anticancer agents, antivirals, or beta-lactam antibiotics. For aminoglycoside antibiotics (concentration-dependent antibacterial), the peak concentration is important; for vancomycin or immune-suppressants, the area under curve (AUC) or its corresponding average concentration is important; and for traditional cancer chemotherapies, the cumulative AUC is the most important PK parameter for clinical response over a treatment period.

Since there are variations in absorption, personality, and pharmacological effects of most drugs between adults and children, therapeutic drug monitoring is particularly important for personalizing treatment in an ageing population and optimizing drug efficacy in children. The following review demonstrates numerous parameters affecting drug monitoring, priori and posteriori drug monitoring, limits, and drug monitoring implementations. Modern methods for monitoring therapeutic drugs are highly sensitive, ultra-fast, use micro volume, and necessitate highly expensive sophisticated instrumentation, such as liquid chromatography high resolution TOF mass spectrometry, LC/MS/MS small volume micro assay technique, paper spray mass spectrometry, and so on.

Correspondence to: Yusuf Tutar, Department of Basic Science and Biochemistry, University of Health Sciences, Sivas, Turkey, Email: ytutar@cumhuriyet.edu.tr

Received: March 03, 2021; **Accepted**: March 17, 2021; **Published**: March 24, 2021

Citation: Tutar Y (2021) Importance of Therapeutic Drug Monitoring (TDM). J Clin Chem Lab Med. 4:e105.