ISSN: 2329-6887
Journal of Pharmacovigilance

OPEN ACCESS Freely available online

Opinion Article

Note on Therapeutic Drug Monitoring

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DESCRIPTION

Therapeutic drug monitoring is the measurement of specific drug levels in the blood at regular intervals in order to keep the drug levels in the circulation relatively constant. Monitored drugs usually have a narrow "therapeutic index" and there are differences between the toxic and therapeutic doses of the drug. With some drugs, maintaining this constant level in the blood cannot be achieved simply by giving a standard dose of the drug to everyone. Each person absorbs, metabolizes, uses, and eliminates the drug at various rates, depending on age, general health, genetic makeup, and exposure to other drugs being taken. These factors can change over time and can change daily or with different medical conditions. Not all drugs require treatment monitoring. Most drugs have a wide therapeutic index and can be prescribed using standard dosing schedules. Although the effectiveness of these treatments has been evaluated, it is not necessary to regularly monitor the circulating levels of the drug. Examples of drugs that do not require level monitoring are many of the drugs for hypertension (hypertension) and the antibiotics used to treat bacterial infections. Treatment was effective when the infection was resolved with the antibiotics given, or when the blood pressure dropped with the prescribed blood pressure medication.

Why is TDM important?

Many medications that require treatment monitoring are taken for life. Through life events that can change a person's level of treatment, such as pregnancy, temporary illness, infections, mental and physical stress, accidents, surgery, etc., they maintain a constant level each year as they get older. Over time, people require lifelong medication and can develop other chronic medical conditions that can interfere with the processing of monitored medication. Examples of these diseases are cardiovascular disease, kidney disease, thyroid disease, liver disease and HIV. Therapeutic drug monitoring follows these changes and takes them into account. It identifies the effects of drug interactions when a person is not taking the drug regularly as prescribed (patient non-compliance) and results in higher or lower drug concentrations at certain doses. Patient needs that may help with special dose customization. In addition to tests such as BUN, creatinine, and liver function tests, monitoring of the drug Helps detect diminished ability and dysfunction of the body to metabolize and eliminate the drug. Testing can also determine how a drug interacts with other needed drugs.

Purpose of therapeutic drug monitoring

Performing TDM requires an interdisciplinary approach. Accurate and clinically meaningful drug concentrations can usually only be achieved with the full cooperation of a TDM team of scientists, clinicians, nurses and pharmacists. Good communication between team members is required to ensure that TDM best practices are achieved.

Indications for drug monitoring have expanded to include, efficacy, compliance, drug interactions, toxicity avoidance, and treatment discontinuation monitoring. Measuring plasma levels alone can be useful in a variety of situations, but each indicator may not apply equally to each drug. However, measuring plasma levels can be useful because low measurements reflect poor current compliance or treatment. Poor compliance if the patient is prescribed a dose that is unlikely to be associated with the measured low concentration, or if previous measurements suggest that plasma concentration should be higher for a given dose. At the beginning of drug therapy, it may be helpful for the doctor to measure the plasma concentration of the drug and adjust the dose individually. This guideline applies to all drugs, but is most important for people with a narrow therapeutic index, such as: Ƀ Lithium cyclosporine and aminoglycoside antibiotics. If for some reason the dosing regimen needs to be changed later in treatment, for example, in patients with B-renal failure, measurement of plasma levels may be helpful. If an inadequate clinical response is observed, treatment of an established condition can be inferred. However, when the drug is used as a prophylactic, it is not possible to monitor the reaction. Therefore, the doctor can choose the dose that will produce a particular target plasma concentration. Aronson and Hardman found that dose selection based on an assessment of the drug's plasma concentration reduced *Digitalis* toxicity to less than 4%. This method is not yet widely used. Therefore, measurements of plasma digoxin levels are performed in patients treated with *Digitalis* renal dysfunction, the elderly, and patients with rapid atrial fibrillation who require high doses of *Digitalis* to control heart rate.

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Received: 20-Dec-2021, Manuscript No. JP-22-1114; **Editor assigned:** 22-Dec-2021, PreQC No. JP-22-1114(PQ); **Reviewed:** 5-Jan-2022, QC No. JP-22-1114(PQ); **Revised:** 10-Jan-2022, Manuscript No. JP-22-1114(R); **Published:** 17-Jan-2022, DOI: 10.35248/2329-6887, 22.1.351.

Citation: Jonson LS (2022) Note on Therapeutic Drug Monitoring. J Pharmacovigil. 10:351.