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Perspective

Measuring Plasma Drug Concentration in Therapeutic Drug Monitoring

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DESCRIPTION

The contribution of pharmacokinetic variability to variations in dose necessities may be recognized with the aid of using measuring the drug attention at consistent and enhancing the dose to acquire a favored attention recognized to be related to efficacy. However, there may be massive inter-person pharmacodynamic variability at a given plasma attention, for this reason various concentrations instead of single level is typically targeted. For a constrained variety of medication for which there may be a higher relationship among plasma or blood concentration-reaction than dose-reaction, the measurement of plasma or blood concentrations has turn out to be a precious surrogate index of drug publicity exposure in the body.

The pressure within the healthcare system to provide services at the lowest possible cost continues. Therefore, the role of many drug analysis laboratories is to measure the concentration of therapeutic agents in blood samples and correlate this number with the range of treatment. Therapeutic drug measurements are only part of TDM and provide expert clinical interpretation of drug concentrations and evaluations based on pharmacokinetic principles. Interpretation by a drug concentration measurement expert is essential to ensure full clinical benefit. Clinicians regularly monitor the pharmacodynamics of drugs by directly measuring physiological indicators of therapeutic response such as lipid levels, blood glucose, blood pressure, and coagulation. For many drugs, measurement of efficacy is not readily available or the method is not sensitive enough. Therefore, the process of TDM is predicted under the assumption that there is a clear relationship between dose and plasma or blood drug concentration, and between blood drug concentration and pharmacodynamic effects. By measuring plasma drug levels, doctors can discontinue treatment in two well-known situations. First, treatment should be discontinued if digoxin plasma levels in patients with satisfactory clinical status fall below therapeutic range, so that discontinuation of digoxin is unlikely to result in clinical deterioration. Note that this use of plasma concentration measurement relies on the notion that there is a lower bound on the range of treatment. This does not apply to other drugs, especially phenytoin. If there is no response to lithium and serum levels are at the upper end of the therapeutic range, increasing the dose is probably not beneficial and increases the risk of toxicity. Lithium discontinuation and use of another treatment are guaranteed. Dosing concentration measurements are necessary to manage the patient's current dosing schedule and to screen for dosing. You can also implement a procedure to assess whether a drug test requirement is justified before the actual test is performed. This ensures reasonable use of resources. This is often time consuming for administrative staff, but can be cost-effective as it avoids expensive tests that do not help immediate or long-term patient care. For a small number of drugs, measuring plasma levels is useful in clinical practice.

Even drugs that meet these criteria have some controversy over the usefulness of monitoring their plasma levels. First, there is no good evidence that targeted plasma concentrations improve treatment outcomes, and it has been argued that the therapeutic value of plasma monitoring needs to be tested. However, these arguments ignore the underlying principles. There is a stronger relationship between plasma concentration and effect than between dose and effect, suggesting that monitoring plasma concentration should improve drug treatment. Second, problems in defining the scope of treatment, such as the problems encountered when conditions change the pharmacodynamic effects of a drug, have been argued to reduce the value of the technology. However, this discussion only emphasizes the need for a correct interpretation of plasma drug concentrations under such conditions. Third, some argue that the plasma concentration itself, not the patient, is being treated, for example, improper timing of sample collection makes monitoring is misused. We argue that this last point suggests that the information provided by plasma drug concentration monitoring is being abused. There is no reason to routinely measure plasma drug levels without a specific purpose. In fact, routinely measuring plasma drug levels without a clear purpose is as irresponsible as not taking any measurements.

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