Clinical cases

PREANALYTICAL MYSTERIES

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When a test result from a routine method deviates more than expected from the result that would have been obtained with the reference measurement procedure, as defined by its measurement uncertainty, the result is deemed an irre-gular analytical error. Although these are considered analytical, it is often difficult to differentiate them from preana-lytical errors. In general, if this error is caused by the interference already recognized by the reagent manufacturer, it is considered preanalytical, since this information was not known or not communicated to the laboratory. In automated immunoassays such errors may be caused by cross reactivity of anti-reagent and anti-analyte antibodies, polymerisa-tion and formation of macromolecular species, matrix effects, or biotin supplementation in assays employing its bin-ding reaction with streptavidin. In clinical chemistry errors like haemolysis, patient misidentification or contamination might be frequent, while in coagulation, the most prevalent errors are clotted plasma or underfilled blood collection tubes. Reports on the frequency of preanalytical errors differ, depending on the sample matrix, the local setting, the type of detection, and the cut-off used to define the observation as an error, but it is unanimous agreed upon that they account for the majority of errors within the total laboratory testing process. In order to maintain a high quality and to ensure patient safety, the laboratory must be alert to these and other preanalytical errors by having according detection systems and countermeasures in the form of a plan-do-check-act cycle in place. However, since such errors are specimen/patient and technique specific, repeating a potentially biased test would yield the same result. Hence, preanalytical errors are difficult to detect, especially when relying on internal quality control procedures only. There-fore, it is crucial to closely collaborate with clinicians and nurses, who must have an understanding on the existence, causes, frequency and importance of preanalytical errors. They need to communicate any discrepancy of laboratory result in context with the patients' medical history. In our lecture, we will present a series of case reports of erroneous laboratory test results as a consequence of such errors.