Cost-Effective Detection of Anomalous Immunoglobulins in Serum

A major goal for clinical laboratories is to provide accurate results in the minimum time at minimum cost. For some tests there is little or no choice; “stat” tests must ordinarily be run as quickly as possible, and the laboratory must purchase enough help and instrumentation for this. Other tests, however, do not require an immediate response. For example, measurement of immunoglobulin concentrations, or investigation of a serum for a monoclonal immunoglobulin, is often part of a larger work-up that may take several days to complete. Fast turnaround is thus much less important than accuracy, and the laboratory can concentrate on productivity and cost-effective procedures.

There is no “best” procedure for analyzing sera for anomalous immunoglobulins. Many laboratories prefer to follow an established sequence of a protein electrophoresis, quantification of immunoglobulin classes, and routine immunoelectrophoresis. Immunofixation and quantification of kappa and lambda light chains are used as final back-up or confirmatory procedures. Other laboratories prefer a shorter protocol of quantification of immunoglobulin classes and light chains, and immunofixation, with other procedures as a back-up if needed.

In an effort to standardize these procedures, some laboratories have investigated the use of high-resolution electrophoresis and the quantification of total kappa and lambda light chains. These techniques, when coupled with quantitative immunoglobulin data, provide extensive information on the status of immunoglobulins in a given serum (1-4), and promise to provide a more rational approach to the analysis of serum immunoglobulins. The paper in this issue by Keren et al. (5) is a good start towards this goal. These authors present guidelines for the most efficient utilization of laboratory equipment and staff in the detection of monoclonal gammopathies. They used high-resolution electrophoresis in agarose, not cellulose acetate, and quantified IgG, IgA, IgM, total kappa, and lambda light chains by nephelometry. They then established eight possible interpretations, some of which led to further testing by immunofixation. These guidelines provide a solid working procedure, which eliminates about 90% of unneeded immunofixation or immunoelectrophoresis. The key to these guidelines is the ability to quantify total kappa and lambda light chains in serum; these results are then correlated with the immunoglobulin data and the interpretation of the high-resolution electrophoresis. These procedures may miss cases of low concentration of light chains in serum (6), but such cases should be detected by urinalysis, which should be a component of the work-up.

The present financial climate in clinical laboratories is such that all tests performed must be cost effective. The outlines provided in this paper provide useful guidelines for one aspect of the testing profile. We now need to apply these ideas to the remainder of our test repertoire.

References

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