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Monoclonal gammopathies

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Clinical background

The finding of a monoclonal immunoglobulin in the serum defines the so-called monoclonal gammopathy. Monoclonal components are homogeneus immunoglobulins whole (intact) or fragmented, produced by a single expanded plasma cell clone. MCs present unique physicochemical homogeneity, which is reflected in their immunological homogeinity. Immunological homogeinity by electrophoresis is shown with the appearance of a compact band which possesses only a single type of heavy and light chains.

Protein electrophoresis is, therefore, a main method in the laboratory of clinical chemistry in particular for the relief and the quantification of Monoclonal Components [1-4].

Together with the traditional techniques of electrophoresis on cellulose acetate or agarose gel, other analytical approaches are emerging to highlight and quantify the CM. In particular, in recent years, several authors have emphasized the usefulness of capillary electrophoresis both to highlight the CM and for their quantification [5,6].

We considered appropriate to determine, on a personal case study:

The performance of capillary electrophoresis to show small, medium and large monoclonal components comparing the data obtained by this technique with those obtained with traditional techniques, particularly with agarose gel electrophoresis.

We performed the quantification of the CM both in capillary electrophoresis and through conventional densitometry.

Assessing sensibility of the two methods to show the CM by determining the minimum detectable concentration of CM with the two methods.

Conclusions

Capillary electrophoresis has proven a reliable method in highlighting and quantifying CM and besides involves operational advantages such as fully automated execution, the operating speed is extremely limited and performers need a lower experience. This is translated into more reproducible constant results over time. It's important, however, to emphasize the need for a careful examination of the electrophoretic paths obtained. Often, in the presence of CM, only slight modifications of the path are observed that could escape a careless observer. When in doubt, immunofixation will still solve the problem.

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