



CPAL

Central Pennsylvania Alliance
Laboratory

Technical Bulletin

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Some Issues of Protein Electrophoresis

1. CSF Protein Electrophoresis Will be Stopped at CPAL on July 1, 2002

Due to the low test volume of CSF electrophoresis, CPAL has determined to stop doing CSF protein electrophoresis starting on July 1, 2002. It will be more cost effective to send CSF protein electrophoresis to AML.

2. Technology of Immunofixation Electrophoresis (IFE)

CPAL is currently using Sebia's technology for protein electrophoresis and immunofixation electrophoresis. Sebia's reagents for anti-immunoglobulins are very sensitive, especially to lambda light chain. The manufacturer has stated:

- (1) "The resolution and sensitivity of immunofixation have improved during recent years. The apparent downside of these improvements to some, is presence of restrictions that have not been seen before under similar circumstances and do not appear to represent malignant clone proliferation. However, the observed patterns reflect real monoclonal or polyclonal processes. Such patterns, usually reflecting marginal concentrations are often of uncertain etiology. Yet, they should not be ignored as the underlying conditions might develop over time into more serious, defined disorder requiring treatment." (Borek Janik, "Electrophoresis and Immunofixation of the Protein of Serum, Urine and Cerebrospinal Fluid, A Brief Guide", Sebia, p48, July 2001.)
- (2) "The average risk of progression of MGUS (monoclonal protein of undermined clinical significance) to malignant plasmaproliferative or lymphoproliferative disorders was 1-2% per year." (Borek Janik, "Electrophoresis and Immunofixation of the Protein of Serum, Urine and Cerebrospinal Fluid, A Brief Guide", Sebia, p56, July 2001.)
- (3) "It has been reported that about 60% of detectable M-components are too small to be quantifiable by densitometry and another ca. 20% are < 0.5 g/dL. About 15% and 25 % in these two groups, respectively, were associated with BJP in urine where K and L free light chains were equally represented." (Borek Janik, "Electrophoresis and Immunofixation of the Protein of Serum, Urine and Cerebrospinal Fluid, A Brief Guide", Sebia, p58, July 2001.)

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For question about this, and other, information, call Central Pennsylvania Laboratory at 1-888-480-1422

(4) **“Patient follow-up:**

The concentration of the monoclonal component, the type of monoclonal gammopathy, stage of the disease and the treatment regimen are the basic considerations in the patient follow-up. TABLE VII provides only a very simplified outline of the complex task of patient follow-up.

TABLE VII. Patient follow-up

PATIENT	OTHER TESTS	EP & IFE FOLLOW-UP
M-protein <1.5 g/dL	asymptotic patient normal Hb, Ca, renal function	6-12 months
M-protein 1.5 - 2.5 g/dL	assay urine for M-protein assay Hb, Ca	if other tests normal, in >3 months: serum & urine
M-protein >2.5 g/dL	metastatic bone survey* bone marrow biopsy* assay urine for M-protein	if other tests normal, in 2-3 months in serum & urine
treated for multiple myeloma, Waldestrom’s, amyloidosis		in 1-2 months in serum & urine
Hyperviscosity syndrome	serum viscosity correlate M-protein level (EP) w/ symptoms & need for plasma exchange	use M-protein level (by EP) to anticipate repeat of plasma exchange
Cryoglobulins	assess cryoglob. in all M-protein patients (IgM!) w/ symptoms	use IFE to characterize cryoglobulin

**Only when other tests or presence of symptoms suggest involvement of plasma or lymphoproliferative conditions.”*

(Borek Janik, “Electrophoresis and Immunofixation of the Protein of Serum, Urine and Cerebrospinal Fluid, A Brief Guide”, Sebia, p61, July 2001.)

3. Interpretation Guidelines for Serum Immunofixation Electrophoresis at CPAL

The manufacturer’s guidelines to interpret serum immunofixation electrophoresis have been modified slightly to compensate for the extreme sensitivity of the new antisera used by Sebia in an effort to reduce the number of cases with clinically insignificant protein bands reported. Quantification of M-protein is established by serum protein electrophoresis (EP).

(1) **For M-protein above 2.5 g/dL, use**

Immunofixation electrophoresis, Serum Interpretation:

An (IGGK, IGGL, IGAK, IGAL) monoclonal protein has been detected. This may be observed in

myeloma, lymphoproliferative disorders, amyloidosis, or immunoglobulin deposition disease [Arch Pathol Lab Med 1999;123:108-113].

(2) For M-protein between 1.5 - 2.5 g/dL, use

Immunofixation electrophoresis, Serum Interpretation:

An (IgGk, IgGl, IgAk, IgAl, IgMk, IgMI) monoclonal protein of undetermined clinical significance has been detected. Consider urine electrophoresis and/or repeat serum electrophoresis in 6 -12 months if clinically indicated. This has been reported in approximately 1% of otherwise healthy persons over the age of 50 years and the frequency is 3% among those over 70 years. Low levels of monoclonal proteins have been reported in patients with solitary plasmacytomas [Arch Pathol Lab Med 1999;123:108-113].

(3) For small but definite bands in the range of 0.1 - 1.5 g/dL, use

Immunofixation electrophoresis, Serum Interpretation:

An (IgGk, IgGl, IgAk, IgAl, IgMk, IgMI) monoclonal protein of undetermined clinical significance has been detected at extremely low concentration. Consider urine immunofixation electrophoresis to rule out BJP and/or repeat serum electrophoresis in 6 -12 months if clinically indicated.

(4) For small, ill-defined bands in the range of 0.05 - 0.1 g/dL, and with normal gamma globulins and/or polyclonal hypergammaglobulinemia, use

Immunofixation electrophoresis, Serum Interpretation:

No definite M-protein detected. A small Ig—band (< 0.05 g/dL) can not be ruled out. Consider urine immunofixation electrophoresis to rule out BJP and/or repeat serum immunofixation electrophoresis in 6 -12 months if clinically indicated.

(5) For anything smaller than 0.05g/dL, use

Immunofixation electrophoresis, Serum Interpretation:

No monoclonal proteins were detected.

- References:** 1. Arch Pathol Lab Med 1999;123:108-113].
2. Borek Janik, "Electrophoresis and Immunofixation of the Protein of Serum, Urine and Cerebrospinal Fluid, A Brief Guide", Sebia, July 2001.

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