Clinical added value of *Serum Protein Electrophoresis*



sebia

The new language of life

SERUM PROTEIN ELECTROPHORESIS (SPE)

What is SPE?

SPE is a simple test, performed routinely, which is used to screen and monitor numerous pathologies such as **inflammatory syndromes, certain cancers, physiological or nutritional disorders.**

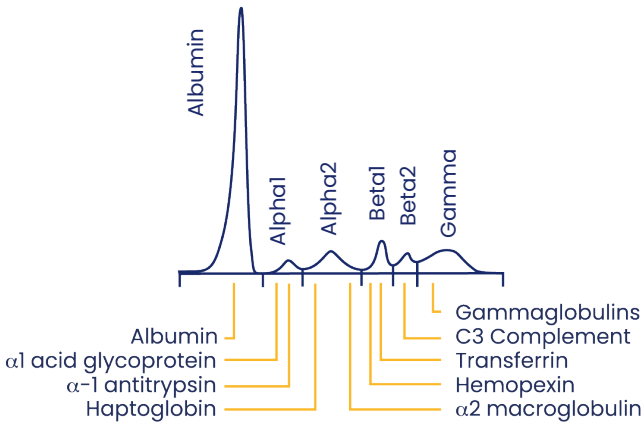
It is an important test in the diagnosis and follow-up of **monoclonal gammopathies**, to observe abnormal proliferation of a lymphoplasmacytic clone (Waldenström, myeloma etc.).

How SPE work?

SPE separates serum proteins under an electric field effect, which migrate at a speed depending on their charge.

When there is an excessive amount of one class of immunoglobulins, it is called monoclonal protein (M protein), M peak (monoclonal peak) or paraprotein.

Normal SPE pattern with Albumin and the five globulin categories:



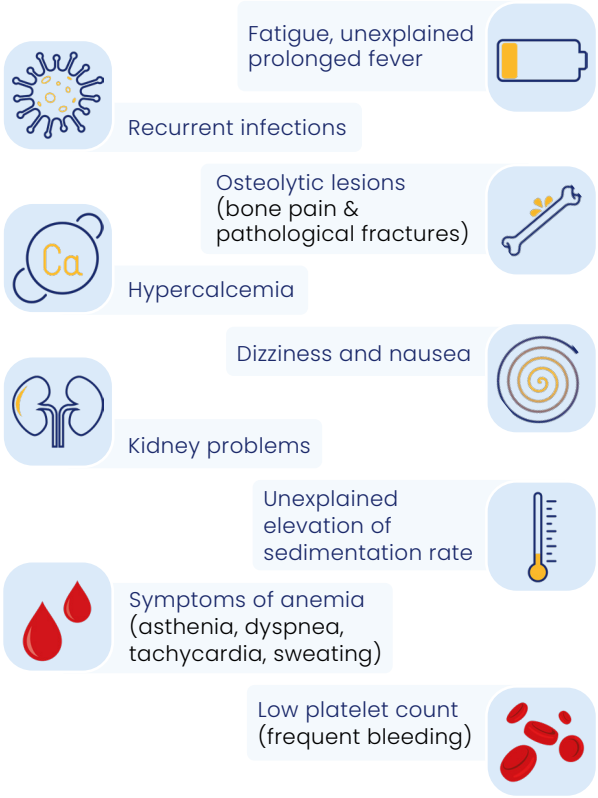
WHEN TO PRESCRIBE SPE?

The conditions for requesting a SPE are specified by the local health administration.

The main reason for performing a SPE is to look for a **monoclonal immunoglobulin** (monoclonal gammopathy, or dysglobulinemia).

This will mostly migrate into the gamma globulin area and sometimes into the beta-globulin or alpha2 globulin area.

SPE should be considered in the following cases:



Other **qualitative and quantitative abnormalities** can be observed and provide **diagnostic evidence to be compared with the patient's clinical status.**

OTHER PHYSIOLOGICAL ABNOMALITIES OBSERVED BY SPE ?

1. **Hypoalbuminemia**

Possible causes: malnutrition, liver failure, chronic infection, myeloma, or fluid overload (hemodilution).

2. **Hyper α1 and α2-globulinemia & decreased albumin**

are synonymous with an inflammatory state.

3. **Fusion of beta and gamma fractions**

Characteristic of cirrhosis

4. **Hypo or hypergammaglobulinemia**

Hypogammaglobulinemia is seen in immune system dysfunction.
Hypergammaglobulinemia is suggestive of myeloma, monoclonal gammopathies, liver diseases, infectious diseases, autoimmune diseases (lupus, rheumatoid arthritis).

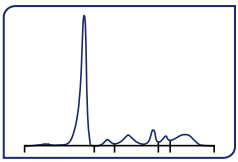
5. **Increase in beta-globulins**

May suggest iron deficiency, hypothyroidism or biliary obstruction.

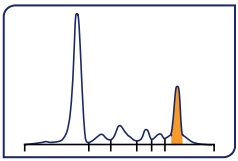
Serum Protein Electrophoresis screening is a simple test to implement that saves precious months of investigation leading an early therapy for better outcome for patients.

EXAMPLES OF ELECTROPHORESIS PROFILES*

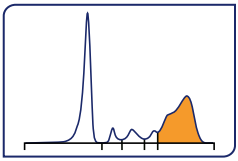
Normal pattern



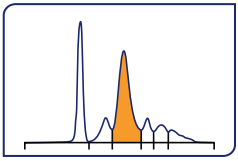
Multiple Myeloma
(Monoclonal gammopathy)
Caution: the absence of peak does not exclude a myeloma, e.g. non-secretory myeloma



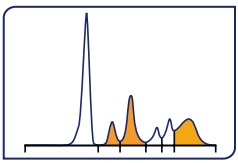
Cirrhosis
(Fusion of the beta and gamma fractions)



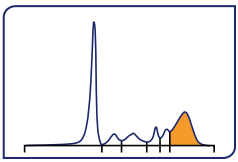
Nephrotic Syndrome
(Increase in $\alpha 2$ and decrease in gamma globulin)



Inflammatory Syndrome
(Increase in $\alpha 1$ and $\alpha 2$ areas)



Hypergammaglobulinaemia



Hypogammaglobulinaemia

*These examples of profiles are given as an indication and are not limited to those presented above.