

Clinical added value of *Serum Protein Electrophoresis*



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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**.

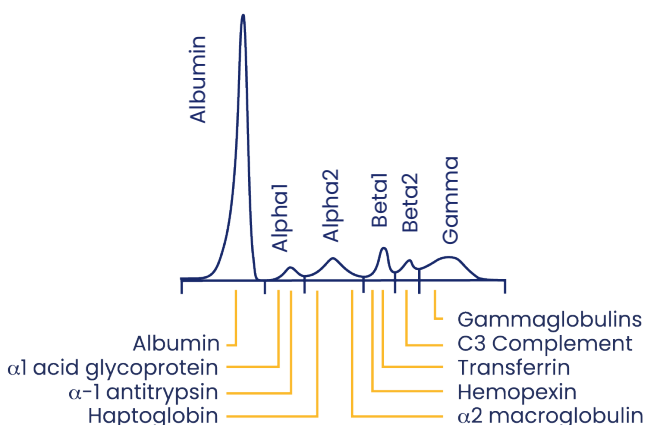
It is an important test in the diagnosis and follow-up of **monoclonal gammopathies**, to observe abnormal proliferation of a lymphoplasmacytic clone (Waldenström, myeloma etc.).

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:



Recurrent infections

Fatigue, unexplained prolonged fever



Hypercalcemia

Osteolytic lesions
(bone pain & pathological fractures)



Kidney problems

Dizziness and nausea



Symptoms of anemia
(asthenia, dyspnea, tachycardia, sweating)

Unexplained elevation of sedimentation rate



Low platelet count
(frequent bleeding)



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



OTHER PHYSIOLOGICAL ABNORMALITIES OBSERVED BY SPE ?

1. Hypoalbuminemia

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

2. Hyper α_1 and α_2 -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).

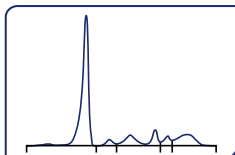
5. Increase in beta-globulins

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*

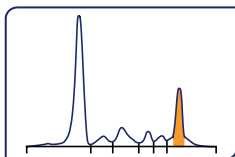
Normal pattern



Multiple Myeloma

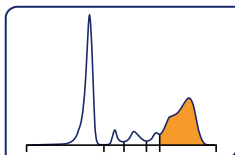
(Monoclonal gammopathy)

Caution: the absence of peak does not exclude a myeloma, e.g. non-secretory myeloma



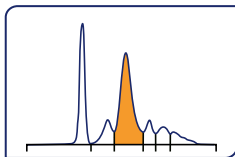
Cirrhosis

(Fusion of the beta and gamma fractions)



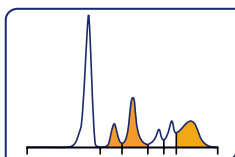
Nephrotic Syndrome

(Increase in α_2 and decrease in gamma globulin)

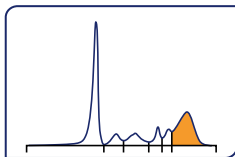


Inflammatory Syndrome

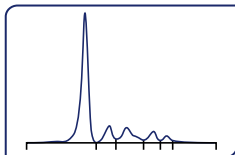
(Increase in α_1 and α_2 areas)



Hypergammaglobulinaemia



Hypogammaglobulinaemia



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

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