Short Communication

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Pertinence of the Immunofixation Prescription in Heterogeneity Restrictions of the Gammaglobulin Zone

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Abstract

Monoclonal gammopathies are regularly materialized on an EPP by a narrow peak in the gamma zone. Sometimes this expression is expressed by a deformation which affects the Gaussian aspect of the curve expressing these gamma globulins it is called restriction of the heterogeneity of the gamma globulins, this can mask a monoclonal gammopathy. Our objective is to study the relevance of prescribing immunofixation in this circumstance. This is a retrospective study of all serum protein electrophoresis completed by immunofixation. 16 patients had restriction of gammaglobulin heterogeneity. Immunofixation revealed that 12 cases (75%) out of 16 had indeed monoclonal gammopathy. It can thus be concluded that the restrictions of gamma heterogeneity in elderly patients should raise the suspicion of monoclonal gammopathies.

Keywords: Immunofixation prescription, Heterogeneity restrictions, Serum protein electrophoresis

Introduction

Monoclonal gammopathy is defined by the presence of a monoclonal peak evolving in the gamma globulin zone during migration by Serum Protein Electrophoresis (SPE), it is coupled with a precipitation technique: Immunofixation (IF) which allows him, by the use of monoclonal antibodies, to identify the fraction concerned. This migration of the monoclonal peak can also occur in the beta-globulin zone or, more rarely, by hypogammaglobulinemia or else a restriction of heterogeneity in the gamma zone.

The Restriction of Heterogeneity (RH) is defined by the working group of the National College of Hospital Biochemistry (NCBH) which adapts to the evolution of capillary electrophoresis by: "The non-respect of the shape of the curve encompassing all of the gamma globulins, with loss of its symmetry without this obligatory presence of the narrow peak, the integration curve presents several points of inflection" [1-3].

RH physiological meaning is the decrease in the diversity of immunoglobulin synthesis, and proliferation to a lesser extent of one or more plasma cell clones. Because of this physiological process, RH can have multiple origins, be transient or long-lasting [4,5]. On a practical level, faced with a restriction of heterogeneity, the question arises whether or not to supplement with immunofixation or simply to monitor.

The objective of this work is to attempt to answer this question by studying the percentage of monoclonal gammopathies in patients presenting with an HR gamma zone at the SPE of the Cheikh Zaid hospital in Rabat.

Materials and Methods

The study was conducted at the medical biology laboratory of Cheikh Zaid university hospital Rabat at the immunology department. It is a retrospective study spread over a period of 18 months (between January 2017 and June 2018), referring to the records of serum protein electrophoresis and immunofixations.

We included in this study, all heterogeneity restrictions completed by immunofixation. Heterogeneity restrictions in patients followed for monoclonal gammopathy, transplant patients, and in those with clinical and biological presentation of an infectious syndrome or autoimmune disease were not included in this study.

Serum protein electrophoresis and immunofixation were performed on agarose gel (HYDRASYS 2scan SEBIA* and HYDRASYS 2scan SEBIA*IF). 1270 serum protein electrophoreses were performed over this 1.5-year period, of which 70 were completed by immunofixation. Out of the 70 immunofixations, 16 of them had heterogeneity restriction in the gamma globulin area (**Table 1**). The diagnosis of biclonal MGUS was retained with strict short-term monitoring

Results

Our study population consists of 16 patients. It corresponds to all those who presented a restriction of heterogeneity to the EPP supplemented by an immunofixation. 12 out of 16 cases presented monoclonal gammopathies and 2 out of 16 cases were bi-clonal gammopathies distributed as follows:

- 7 cases of IgG-Kappa
- 4 cases of IgG-Lambda
- 1 case of IgA-Lambda
- 1 case of 'IgG-Kappa + IgA-Kappa and
- 1 case of IgG-Kappa + IgG-Lambda
- 2 of the 16 cases were normal.

Table 1: Results of electrophoresis completed by immunofixation.

Results of serum protein electrophoresis	Numbers (%)
Monoclonal peak in gamma globulin	48(68%)
Heterogeneity restriction of gamma globulins	16(23%)
Hypogammaglobulinemia	03(4,5%)
Others (Alpha or Beta globulin anomaly)	03(4,5%)
Total	70(100%)

The average age of patients with monoclonal gammopathy was 71 years with an average age of 56 to 89 years. The average age of patients with normal immunofixation was 43 years with a range of 41 to 45 years. 7 of our patients with monoclonal gammopathy were men while 5 of them were women. The two cases with normal immunofixation were female.

Discussion

Immunofixation revealed that 12 of 16 cases (75%) of heterogeneity restrictions had monoclonal gammopathy. During this period, the interpretation of the SPE was carried out by the same biologist according to the aspect of the curve of gamma globulins **(Figure 1).**

The Haute Autorite de Sante de France (HAS) in its recommendations also advises against systematically performing an IF in cases of RH [6,7], which finds some uncertainty in this recommendation. By the results of our study showing that it was relevant to complete HR with immunofixation even if our study does not include patients with benign diseases. The technique used in our study is agarose gel electrophoresis, which is less sensitive than capillary electrophoresis and therefore detects less RH. This would help explain this discrepancy.

In an article on this subject, it was mentioned that the non-declaration of this anomaly could be responsible for a delay in the diagnosis of AL amyloidosis, lymphoma or oligo-secretory myeloma [5,6]. An approach recommended by Keren [5] states that when faced with such a finding, either advice Bence Jones protein performance or include a comment that repeat testing/ follow-up could be considered within a clinically appropriate, e.g. 3-6 months.

The average age of patients with monoclonal gammopathy was 71 years. This has also been reported in other studies. The two

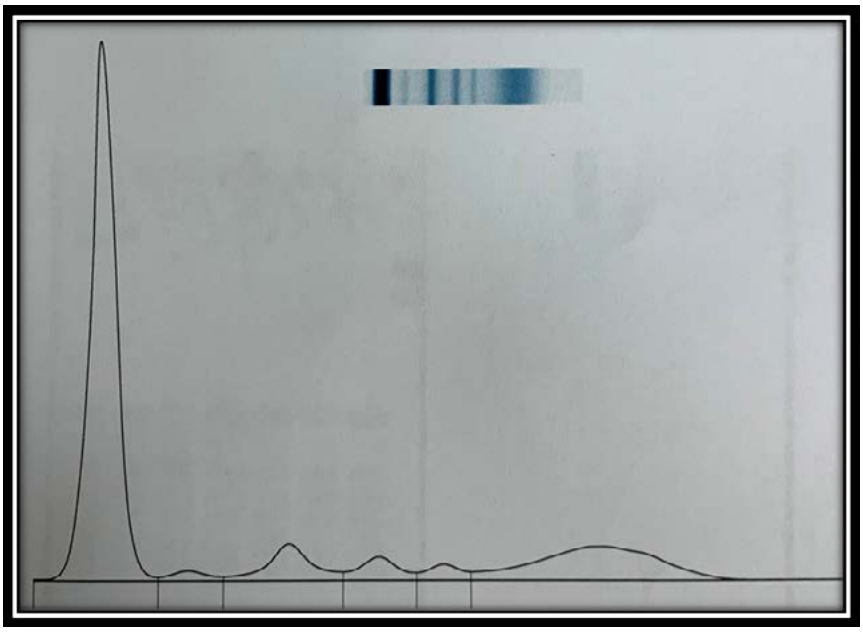

Figure 1 Electrophoretic tracing model interpreted as restriction of heterogeneity.

patients who did not have monoclonal gammopathies were young (41 and 45 years old), which is consistent with the literature. The immunology laboratory of the Sud Lyon hospital group (Hospices Civils de Lyon) offers a scheme for interpreting and monitoring heterogeneity restrictions according to the patient's age and clinical and biological context, which excludes young patients any further exploration [7].

Conclusion

Our study shows that the profiles of heterogeneity restrictions in PPE in elderly patients without benign pathologies are monoclonal gammopathies until proven otherwise. It is therefore appropriate to underline the importance of clinician and biologist collaboration in the establishment of the indication as well as the interpretation and follow-up of borderline cases.

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