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(CASE REPORT)

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Bisalbuminemia associated with monoclonal gammopathy in a patient with lymphoma: A Case Report

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Abstract

Bisalbuminemia is a rare electrophoretic abnormality characterized by two distinct albumin fractions on serum protein electrophoresis [4,5]. Although it is most often hereditary, acquired forms may occur in various pathological conditions. Its association with lymphoproliferative disorders and monoclonal gammopathy is uncommon and poorly documented [7]. We report the case of a 32-year-old man diagnosed with lymphoma, whose serum protein electrophoresis revealed marked bisalbuminemia associated with an IgG kappa monoclonal spike. Immunotyping confirmed the monoclonal nature of the gamma peak [2,7]. Radiological investigations identified multiple lymphadenopathies and secondary neurological involvement. This case highlights the analytical significance of bisalbuminemia in high-resolution electrophoresis and discusses its possible pathophysiological mechanisms in lymphoma [4,6]. Awareness of this rare electrophoretic pattern is essential to avoid misinterpretation and ensure accurate detection of clinically significant monoclonal components [2,6].

Keywords: Bisalbuminemia; Serum protein electrophoresis; Lymphoma; Monoclonal gammopathy; IgG kappa

1. Introduction

Serum protein electrophoresis (SPEP) is a cornerstone technique in clinical biochemistry, widely used for the investigation of dysproteinemias and lymphoproliferative disorders [2,3]. Among the uncommon electrophoretic patterns encountered, bisalbuminemia is characterized by the splitting of the albumin fraction into two distinct bands or peaks[4,5]. Its prevalence is extremely low, estimated at less than 0.01% in routine laboratory practice [5]. Bisalbuminemia may be hereditary, related to genetic variants of the albumin gene, or acquired as a result of structural or post-translational modifications of albumin [4,5].

Although bisalbuminemia is generally considered a benign and incidental finding, its occurrence in patients with malignant hematological diseases raises important interpretative issues [4,7]. In particular, the coexistence of bisalbuminemia with monoclonal gammopathy may complicate the interpretation of electrophoretic profiles. This report aims to highlight the significance of bisalbuminemia observed in a patient with lymphoma and associated monoclonal gammopathy, and to review the specific literature related to this rare electrophoretic phenomenon [4,7].

2. Case Report

A 32-year-old male patient was admitted for progressive cholestatic jaundice evolving over a five-month period, associated with general deterioration, diffuse abdominal pain, and neurological impairment manifested by paraplegia. He had no significant medical or surgical history. Clinical examination revealed marked cutaneo-mucosal jaundice and

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signs suggestive of systemic disease. Laboratory investigations showed severe normocytic anemia, leukocytosis, and thrombocytosis.

Serum protein electrophoresis performed as part of the etiological assessment demonstrated normal total protein levels (68 g/L) with hypoalbuminemia (33.5 g/L) and a decreased albumin/globulin ratio (0.97). Notably, the albumin fraction was split into two distinct peaks of comparable morphology, consistent with bisalbuminemia. In addition, a narrow and symmetrical monoclonal spike was detected in the gamma region, quantified at 9.1 g/L.

Immunotyping by capillary immunosubtraction confirmed the monoclonal nature of the gamma peak, identifying an IgG kappa monoclonal gammopathy. Radiological investigations revealed multiple supra- and infra-diaphragmatic lymphadenopathies, biliary compression, and secondary neurological involvement, supporting the diagnosis of an underlying lymphomatous disease.

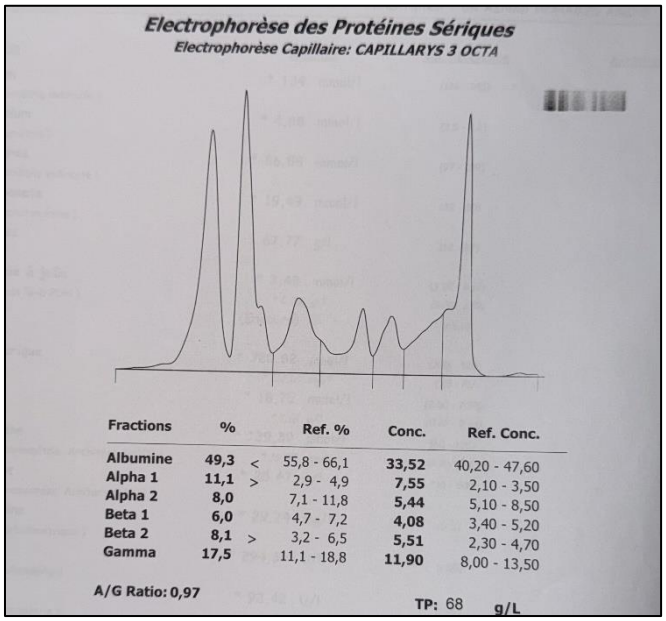

Figure 1 Serum protein electrophoresis revealing bisalbuminemia and a monoclonal band in the gamma globulin region (9.1 g/L)

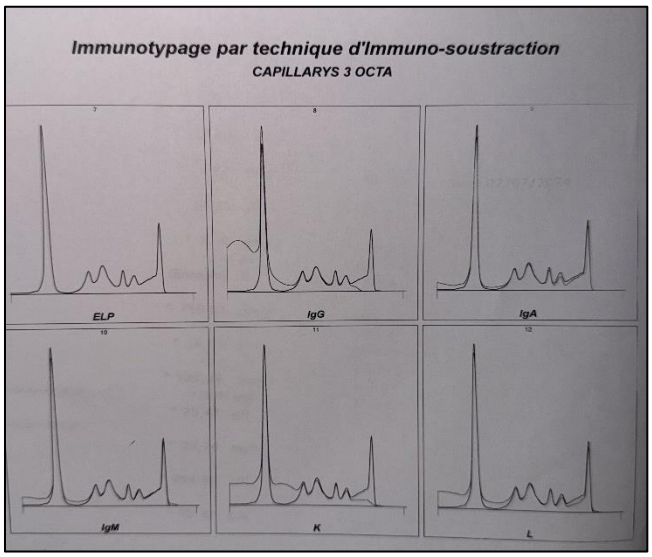

Figure 2 Immunotyping revealing an IgG kappa–type monoclonal gammopathy

3. Discussion

Bisalbuminemia represents a rare but well-recognized electrophoretic variant [4,5]. Hereditary bisalbuminemia results from point mutations in the albumin gene leading to altered electrophoretic mobility, while acquired forms have been associated with liver disease, pancreatic disorders, diabetes mellitus, nephrotic syndrome, and exposure to certain drugs, particularly beta-lactam antibiotics [5]. In malignant conditions, acquired bisalbuminemia may reflect abnormal albumin binding or post-translational modifications in an inflammatory or neoplastic environment [4,5].

In the context of lymphoma, chronic inflammation, altered protein synthesis, and increased proteolytic activity may contribute to albumin heterogeneity [7]. Some authors have suggested that acquired bisalbuminemia may result from partial proteolysis or glycation of albumin, leading to electrophoretic splitting [4,5]. Although no direct causal relationship between bisalbuminemia and lymphoproliferative disorders has been firmly established, their association may serve as an indirect marker of profound metabolic and protein alterations [7].

From an analytical standpoint, the presence of bisalbuminemia highlights the high resolving power of modern capillary electrophoresis systems [6,9]. Importantly, this variant did not interfere with the detection or immunotyping of the monoclonal component in our patient. On the contrary, the clear separation of albumin fractions confirmed the technical reliability of the electrophoretic analysis, reinforcing confidence in the identification of the monoclonal IgG kappa spike [2,6,8].

The literature reports only a limited number of cases describing bisalbuminemia associated with monoclonal gammopathies or hematological malignancies [4,7]. This rarity underscores the interest of reporting such cases, particularly for laboratory physicians, as misinterpretation of unusual albumin patterns may lead to diagnostic errors if not recognized [2,6].

4. Conclusion

This case report highlights bisalbuminemia as a rare electrophoretic finding observed in a patient with lymphoma and associated IgG kappa monoclonal gammopathy. Although clinically benign, bisalbuminemia carries significant analytical relevance and should be recognized by clinical biochemists to ensure accurate interpretation of serum protein electrophoresis. Its association with lymphoproliferative disease warrants further investigation to clarify its pathophysiological significance of bisalbuminemia in lymphoproliferative disorders.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

All authors declare no conflicts of interest related to this manuscript.

Statement of informed consent

Informed consent was obtained from the patient for participation and publication of relevant data and images.

References

[1] Dati F, Schumann G, Thomas L, et al. Consensus of a group of professional societies and diagnostic companies on guidelines for interim reference ranges for 14 proteins in serum based on the standardization against the IFCC/BCR/CAP reference material (CRM 470). Clin Chem Lab Med. 1996;34(6):517–520.

[2] Keren DF. Protein electrophoresis in clinical diagnosis. Am J Clin Pathol. 2003;119(3):S23–S30.

[3] Kaplan LA, Pesce AJ, Kazmierczak SC. Clinical Chemistry: Theory, Analysis, Correlation. 6th ed. St. Louis: Mosby Elsevier; 2010.

[4] Lee KN, Lee SY, Kim HS. Bisalbuminemia detected by capillary electrophoresis: case report and literature review. Clin Chim Acta. 2011;412(23–24):2264–2266.

[5] Van Hoof V, De Broe ME. Interpretation and clinical significance of bisalbuminemia. Clin Chem. 1994;40(10):1866–1867.

[6] Bossuyt X, Lissoir B, Marien G, et al. Automated serum protein electrophoresis by capillary zone electrophoresis. Clin Chem Lab Med. 2003;41(5):704–710.

[7] Kyle RA, Rajkumar SV. Monoclonal gammopathies of undetermined significance. N Engl J Med. 2004;351(18):1860–1873.

[8] Katzmann JA, Clark RJ, Abraham RS, et al. Serum reference intervals and diagnostic ranges for free κ and free λ immunoglobulin light chains. Clin Chem. 2002;48(9):1437–1444.

[9] Sebia. Clinical Applications of Capillary Electrophoresis in Serum Protein Analysis. Technical monograph. Lisses, France; 2018.