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Case Report

Title: Bisalbuminemia : A rare electrophoretic run

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ABSTRACT

Background: Bisalbuminemia is a rare finding on serum protein electrophoresis characterized by bifid albumin peak in the electrophoretogram .
Methodology: Investigative serum protein electrophoresis (SPEP) was performed in a a 63 year old female, diabetic and hypertensive patient on third generation cephalosporin using the automated electrophoresis system 'Minicap' from SEPIA.
Results: The automated densitometric scanning system of the apparatus showed two distinct bands in the albumin region. No bifid bands were observed in the electrophoretogram for albumin.
Conclusion:
This was a rare case having bisalbuminemia with two distinct bands detected in our region. Further investigations are needed to reach a definite diagnosis.

INTRODUCTION

Bisalbuminemia is a rare electrophoretogram finding characterized by bifid albumin peak in densitometric scan . Scheurlen in 1955 first described this finding in a German diabetic patient. (1) The incidence of these variants has been reported to be around 1 in 1000 to 1 in 3000 in different studies worldwide .(2)This disorder is infrequent in India although not rare . In the serum protein electrophoresis (SPEP) eleltrophoretogram of bisalbuminemia two distinctly separate albumin peaks are found because of their dissimilar mobilities in the electrophoretic field.
There have been very limited study on this limited to only case reports.

Bisalbuminemia may be inherited or acquired in nature . When inherited it is of autosomal dominant (occurring with a cumulative frequency of 1:1000-1:10,000)(3)(4) in nature , however acquired bisalbuminemia which on incidental finding, may guide clinicians on the way to diagnosis. The acquired form of the disease can be seen in patients with pancreatic pseudocyst rupture, Diabetes mellitus, Cirrhosis, hyperamylasemia, nephrotic syndrome, chronic kidney disease , sarcoidosis, Alzheimer's disease, plasma cell dyscrasia like Waldenstrφm's macroglobulinemia and patients taking beta lactum antibiotics (3)(5)(6)(7)(8).

Methodology:
Case selection:
We reported a case of bisalbuminemia in a 63 year old female patient admitted with electrolyte imbalance , fever , arthralgia and bone pain . She was a known hypertensive and Diabetic patient ,diagnosed 15 years back . She was on irregular oral hypoglycemic drug intake but on admission was changed to Insulin (Actrapid 6U TDS and Lantus 14 U at 10 pm) to tide over the crisis (FBS-234 mg/dl & PPBS 409 MG/DL) . Her blood culture revealed of septicemia and she was given third generation cephalosporin .

Technical procedures: On investigation with a suspicion of multiple myeloma, her serum was run for serum protein electrophoresis (SPEP) in our automated capillary electrophoresis (Sebia Minicap).

Results: SPEP showed presence of bisalbuminemia without any M- spike or any other abnormal peak . The run was quite a unique one to have shown two completely separate peaks in the albumin zone and not a single bifid peak (figure 1). On enquiry it was found that she had not gone through any contrast imaging studies which could have resulted in such an electrophoretic pattern . Moreover , we repeated the sample after three days to recheck which revealed the same pattern (she was on third generation cephalosporin during that period).The patient was asked to repeat sample after 6 months to rule out the chance for hereditary bisalbuminemia The patient's relatives were also asked about any previous history of such case in the family . They were asked to undergo Serum protein electrophoresis to rule out the hereditary background of the case which was not possible due to financial constraint.

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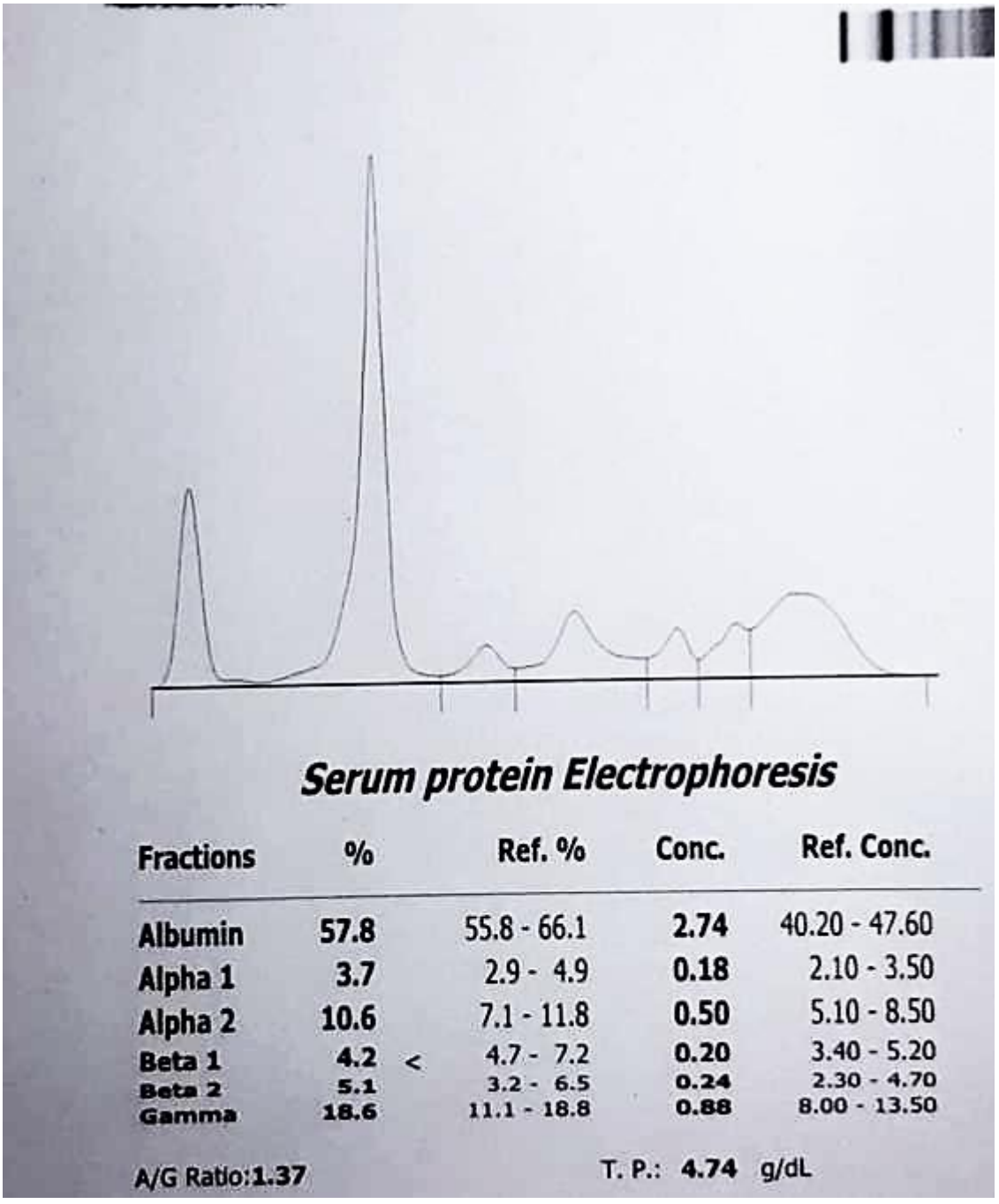
Discussion:

Bisalbuminemia is a rare finding in India that has been linked to various disorders like type 2 diabetes mellitus, pancreatic pseudocysts etc. Bisalbuminemia may also occur due to mutations in the gene for albumin synthesis that is transmitted in an autosomal codominant manner. Acquired bisalbuminemia may indicate some underlying pathology which can be further explored by the concerned clinician for reaching a definitive diagnosis in time. Furthermore, cases of hereditary bisalbuminemia have important implications in protein evolution and anthropological developments. Genetic mutation and molecular pathology of hereditary bisalbuminemia provide important cues for delineating the protein evolution for the albumin. This may also be of significant anthropological interest and correlate the same with the geographical distribution of cases worldwide. It is more common to find bisalbuminemia with a single bifid albumin peak . However, when an altogether separate albumin peaks are seen they can pose a challenge for diagnosis and can create confusion which was unique about our case of interest.

Conclusion :

Acquired bisalbuminemia can point towards underlying pathology guiding the clinicians towards diagnosis . Moreover studying about hereditary Bisalbuminemia along with the molecular behavior of albumin may point towards protein evolution and correlating the same with the geographical distribution of cases may be of anthropological interest . Routinely found bisalbuminemia has a single bifid albumin peak . However presence of an altogether separate albumin peak can pose a challenge for diagnosis and can create confusion which was unique about our case of interest .



Serum protein Electrophoresis

Fractions	%		Ref. %	Conc.	Ref. Conc.
Albumin	57.8		55.8 - 66.1	2.74	40.20 - 47.60
Alpha 1	3.7		2.9 - 4.9	0.18	2.10 - 3.50
Alpha 2	10.6		7.1 - 11.8	0.50	5.10 - 8.50
Beta 1	4.2	<	4.7 - 7.2	0.20	3.40 - 5.20
Beta 2	5.1		3.2 - 6.5	0.24	2.30 - 4.70
Gamma	18.6		11.1 - 18.8	0.88	8.00 - 13.50

A/G Ratio:1.37 T. P.: 4.74 g/dL

Figure 1: A typical case of bisalbuminemia with two distinct bands in albumin region.

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