An Alarming Outcome in Patients Under 40 with Multiple Myeloma

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Introduction

- Multiple myeloma is a malignant plasma cell disorder accounting for almost 10% of hematologic malignancy [1]
- It very rarely presents in ages under 40 years old. Less than 2% of all multiple myeloma cases present in this manner.
- It has been suggested that patients with multiple myeloma of a younger population are associated with more aggressive disease, and less common features which delay the initial diagnosis [2]
- 5% of the under 40 population with multiple myeloma will have cardiac AL amyloidosis [3]
- Less than 1% of all those diagnosed with the disease will survive without treatment

We present a 38 year old African American male who presented to the ED with a past medical history of untreated hypertension for symptoms of shortness of breath for 1 week. He believed it to be due to mold exposure, but began to have symptoms at night. He subsequently developed chest discomfort, as well as exacerbation of symptoms while laying flat. He denied any recent viral illness, sick contacts, antibiotic use, or sick contacts. In the ED, he was hypertensive, and tachycardic. EKG demonstrated left ventricular hypertrophy without ST-T segment elevations or depressions. Troponins were noted to be 5.4 mcg/L, D-dimer was 6.38 ng/mL, and BNP was 1,347 ng/L. Chest x-ray and CTA of the chest did not demonstrate pulmonary embolism. BMP was notable for a creatinine of 1.64 mg/dL. A stat echo was obtained demonstrating an ejection fraction of 15% with severe global hypokinesis.

Case Presentation

A 38 year old male with untreated hypertension presented to the ED secondary to shortness of breath and chest discomfort. He was admitted for a diagnosis of heart failure with reduced ejection fraction secondary to non-ischemic cardiomyopathy confirmed by cardiac catheterization. Due to the renal dysfunction, cardiac dysfunction and abnormalities on CBC, serum protein electrophoresis was ordered, and demonstrated a 6.1 M spike for which hematology was consulted. He did not report any point tenderness of the back, and hypercalcemia was not noted on BMP. In order to differentiate between plasma cell dyscrasias, a beta-2 microglobulin, LDH, quantitative free light chain, fat pad biopsy and bone marrow biopsy were ordered. He was also started on 40mg dexamethasone 4 times daily as preemptive treatment for amyloidosis or multiple myeloma. A bone survey was ordered to assess for lytic lesions which were not found. Kappa/Lambda ratio was noted to be 120.8/6.3 = 196.95. Bone marrow biopsy and fat pat biopsy demonstrated over 40% cellularity involving IgG kappa plasma cell neoplasm. Congo red stain was negative, suggesting absence of cardiac amyloidosis.

A B C

A) Bone marrow biopsy demonstrating monoclonal cellularity B) SPEP findings C) Initial CBC

Imaging

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<th>Albumin</th>
<th>Alpha 1</th>
<th>Alpha 2</th>
<th>Beta-globulin</th>
<th>Gamma globulin</th>
<th>M spike</th>
<th>Globulin Total</th>
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<td>Ht</td>
<td>MCV</td>
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Discussion

- This unique presentation of a person who is under the age of 40 presenting with shortness of breath was found to have a severely failing heart with no prior medical history
- The response to any multiple myeloma regimen is determined by a positive trend of anemia, calcium, renal function, infection, skeletal lesions, extra medullary plasmacytomas, thrombosis, neuropathy and hyper viscosity [4]
- 2 months into treatment, he developed diffuse osseous lytic lesions and was started on Denosumab 120mg SubQ monthly, and 4 months later
- Studies typically show significant improvement following 2 treatment cycles in those over 60[5], but this patient has not had any improvement in the plasmacytoma or cytopenias

Hospital Course

We present a rare patient in a small community hospital with multiple myeloma and suspected cardiac amyloidosis under 40 years old. Despite current treatment guidelines, there are studies that report poor survival outcomes in the younger population classified as under 40 when contrasted with populations over 60 years old. This patient has underwent treatment for 4 months, and has had no improvement in his plasmacytoma, cytopenias, or renal function. More aggressive treatment, and different prognostic factors for this population needs to be ascertained.

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References