

Hyperviscosity Syndrome in Patients With Multiple Myeloma

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A.W., a 50-year-old woman with a six-month history of frequent nosebleeds, was diagnosed with multiple myeloma. Before A.W. could meet with an oncologist, she presented to the emergency room with an uncontrollable nosebleed and spontaneous bleeding in her gums. Her menstrual period, which usually occurs over five or six days, lasted 10 with unusually heavy flow. A.W. also reported prolonged bleeding from cuts but had not noticed petechiae or unusual bruising. She was not taking anticoagulants, such as aspirin or other nonsteroidal anti-inflammatory medications. She felt fatigued and noticed that her blurry vision was getting worse. A.W.'s husband characterized her short-term memory as sluggish, although he did not think she was confused. A.W. also complained of lower back pain that limited her ability to perform usual activities.

The emergency room team determined that A.W. was anemic, with a hemoglobin of 9.1 g/dl, a hematocrit of 30.5 g/dl, and a platelet count of 135,000 per ml. Her serum chemistry values showed hyponatremia (sodium = 123 meq/l, normal range 136–143 meq/l), blood urea nitrogen 26 mg/dl (normal range = 7–20 mg/dl), creatinine 1.3 mg/dl, hypercalcemia (calcium = 8.7 mg/dl, normal range = 8.5–10.5 mg/dl), and hyperproteinemia (total protein = 12.5 g/dl, normal range = 6.5–8.2 g/dl). Her liver and thyroid function tests were normal. A.W.'s prothrombin time was 13.4 sec-

onds, activated partial thromboplastin time 33 seconds, international normalized ratio 1.3 (normal range = 0.7–1.2), and fibrinogen 144 mg/dl (normal range = less than 250 mg/dl). Quantitative immunoglobulins showed an elevated immunoglobulin G (IgG) (11,200 mg/dl, normal range = 620–1,400 mg/dl), but immunoglobulin A (IgA), immunoglobulin D (IgD), and immunoglobulin M (IgM) levels were within the normal range. Serum viscosity level was 4.7 centipoise (cp) (normal range = 1.4–1.8 cp).

A physical examination revealed a thin woman in no acute distress. Vital signs were stable: temperature 37.1°C, blood pressure 108/70 mmHg, pulse 90 beats per minute, respiration 20 breaths per minute, and oxygen saturation 93% on room air, 88% with exertion. The fundoscopic examination revealed peripheral retinal vein hemorrhages. Oral mucosa showed blood oozing from her upper and lower gingivae. Dried and crusted blood was found bilaterally along her nasal mucosa, but A.W. was not actively bleeding. Her neurologic examination was nonfocal. On the Mini Mental State examination, A.W. was unable to recall the three objects she was asked to remember. She was oriented to time, place, and person, and her skin was warm and dry and without petechiae, purpura, or ecchymoses.

A.W. was given normal saline IV at 150 cc per hour and oxygen at 2 L by nasal cannula. She also was given furosemide 20 mg IV. An ear, nose, and throat examination did not

reveal any active bleeding, but a prominent blood vessel seen running along the floor of the left nostril was noted. Various areas with prominent submucosal blood vessels but no evidence of active bleeding were seen on the right nostril. No masses or lesions were noted in either nostril, nasal septum, or nasopharynx. An ophthalmologic examination found midperipheral hemorrhages and vascular tortuosity in the retinae. A fluorescein angiogram revealed moderate delay of transit time in the retinal veins, indicative of hyperviscosity. The healthcare team decided to correct A.W.'s underlying disorder immediately; therefore, she was sent for plasma exchange. After the third plasma exchange, A.W.'s IgG level was down 50% to 5,550 mg/dl and her serum viscosity level dropped to 2.9 cp. In addition, her serum calcium, sodium, and total protein levels normalized. A.W.'s nosebleeds resolved, and her memory and vision improved.

What are the key assessments in patients with multiple myeloma?

The initial assessment of patients presenting with multiple myeloma include determining the type of myeloma (IgA, IgG, or IgD). Quantitative immunoglobulins, serum protein electrophoresis, urine protein electrophoresis, and the percentage of bone marrow involvement should be included in the initial workup. Screening patients for the presence of an M-protein, if they present with signs or symptoms of hyperviscosity syndrome, is prudent (Cook & MacDonald, 2007). A complete blood count with differential is necessary because patients

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Digital Object Identifier: 10.1188/08.ONF.350-352