Thick blood, heavy heart: a case of hyperviscosity syndrome.

BY ALICE LEHMAN, MD

Introduction

Hyperviscosity syndrome (HVS) is a clinical diagnosis in patients that can be associated with significant morbidity. HVS is a complication of viscous blood, secondary often to increased serum protein circulation. The following case highlights potential morbidities associated with a delayed diagnosis of HVS and explores the potential role of laboratory data. A delayed diagnosis of HVS may contribute to delayed diagnoses. Laboratories typically quantify viscosity using a capillary tube that measures the time required for a serum to flow under the influence of gravity. Viscosity indices for serum typically range between 1.4 and 1.8 relative to water. HVS is unlikely unless the viscosity index nears 4.0. There is relative consistency in the viscosity indices at which HVS symptoms appear in the same WM patients. Ultimately, the utility of viscosity indices lies in determining the patient-specific viscosity threshold at which symptoms of HVS appear, thereby helping guide preemptive treatment with PLEX to avoid long-term morbidities. In the presented patient, trending the viscosity indices more consistently and determining relative paraprotein compositions may have helped determine need for PLEX and avoidance of observed complications. A potential barrier to clinical practicality with be distinguishing lab turnaround time for viscosity indices.

PLEX can be expected to reduce plasma viscosity approximately 20-30% per session. However, the underlying etiology of HVS ultimately guides definitive treatment. The complexity of our case lies in the simultaneous presentation of HCV and WM, which begs the question of the correlation between these two diagnoses and their relative contribution to the patient’s HVS. Ten to 30 percent of patients with WM present with HVS. Our patient presented with rheumatoid factor...
tive, cryo-IgM positive, and cyro-Kappa light chain positive, consistent with type III mixed cryoglobulinemia. Previous retrospective studies describe links between HCV infection and B-cell non-Hodgkin’s lymphoma, as well as other B-cell lymphoproliferation, such as WM and monoclonal gammopathy of unknown significance. IgG-bound HCV has been proposed to drive the clonal expansion of RF + B cells. HCV RNA suppression through viral eradication is the most effective treatment for HCV mixed cryoglobulinemia and often leads to a sustained response. As in this case, when HCV cryoglobulinemia and WM present at the same time, it is difficult to differentiate between the contributing factors, which can delay necessary antiviral treatment. More research needs to be done to understand the mechanisms by which HCV triggers B-cell proliferation and whether early recognition and treatment of HCV may ultimately change morbidity.

**Conclusion**

HVS is a subtle clinical presentation with morbid complications for the patient including cerebrovascular infarct, vision loss, acute kidney injury, and heart failure. Laboratory guidance from viscosity indices, in addition to HCV status, can help guide definitive management of treatment. Trending a patient’s viscosity index can help predict acute management with PLEX and therefore potentially avoid associated morbidities.

Alice Lehman, MD, is a second-year resident in internal medicine-pediatrics at the University of Minnesota Medical School.

**REFERENCES**


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**A nightmare vacation**

**BY BETH K. THIELEN, MD, PHD, AND AILEEN AHISKALI, PHARMD**

A 58-year-old Vietnamese-American woman underwent an elective liposuction procedure during a recreational trip to Vietnam. The procedure was complicated by intestinal perforation that then required a colostomy and caused subsequent post-operative wound infection. Management challenges included lack of patient analgesia for procedures, CT imaging, and basic infection prevention tools, including gloves. The infection progressed despite multiple debridements, and cultures grew a multi-drug resistant organism (MDRO) for which appropriate antibiotics were unavailable. The woman traveled back to Minnesota for care.

Upon presentation, she was afebrile and hemodynamically stable with extensive abdominal wall wounds draining purulent material. An abdominal CT scan revealed multiple intra-abdominal abscesses. Empirical vancomycin and piperacillin-tazobactam were started, and exploratory laparotomy with debridement was performed. After operative cultures were obtained, her regimen was broadened to high-dose polymyxin B, high-dose tigecycline, extended-infusion meropenem, and micafungin to cover suspected MDROs. Cultures grew 11 different organisms—including carbapenem-resistant New Delhi metallo-β-lactamase (NDM)-producing Klebsiella pneumoniae and oxacillinase (OXA)-producing Acinetobacter baumannii. She required a prolonged stay in the intensive care unit due to malnutrition, metabolic encephalopathy, and multiple suspected antibiotic-related complications including polymyxin-induced neurotoxicity and tigecycline-induced hepatotoxicity. Her kidney function remained stable while on polymyxin B therapy, but acute kidney injury developed after trimethoprim-sulfamethoxazole was administered. She was hospitalized for three months, during which multiple debridements were performed, and she received 37 consecutive days of antibiotics. She was discharged to an acute rehabilitation facility and will require complex multi-stage reconstruction of her abdominal wall.

This case highlights two emerging and interrelated challenges: the global spread of MDROs and the spread of medical tourism. The emergence of MDROs has created new treatment challenges. Carbapenems remain a mainstay of therapy for many serious infections, but resistance is emerging by multiple mechanisms. One such mechanism is the NDM carbapenemase, which was first described in a traveler from India in 2009 and subsequently found in many other countries. While some new β-lactam/β-lactamase inhibitor combination agents inhibit certain carbapenemases (e.g. K. pneumoniae carbapenemases or KPCs), they do not reliably inhibit the NDM- and OXA-type enzymes produced by the organisms infecting this patient.

There are often limited (or no) treatment options for patients with infections caused by these MDROs. Additionally, antibiotics that retain activity against these organisms are often costly and carry significant risk of toxicity (Table 1).

With increasing global travel, patients are receiving medical care outside of their home country at an increasing rate. In 2012, an estimated 1.6 million North Americans sought medical care abroad, for reasons that include lower cost, access to procedures not available in the United States, and increased comfort in their countries of origin. While many facilities provide high-quality, cost-effective care and fill gaps in local care, the quality is not uniform. Resources exist to help patients and providers make informed choices about prospective facilities and under-