Hematologic Issues in the Geriatric Surgical Patient

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KEYWORDS

• Coagulopathy • Reversal of oral anticoagulants • Elderly

KEY POINTS

- Perform a thorough history and physical examination to uncover hematologic disorders.
- Nutritional deficiencies in elderly patients can lead to coagulopathy.
- Elderly patients with chronic disease, autoimmune disease, or malignancy are at risk for acquiring hematologic disorders.
- An increasing number of patients are prescribed oral anticoagulant/antiplatelet medications.
- There are no US Food and Drug Administration (FDA) approved reversal agents for the new oral anticoagulant medications, but known procoagulant agents with other FDA indications may be effective.

INTRODUCTION

The elderly population in the United States is expanding, with 43.1 million older than 65 years in 2012 expanding to an estimated 83.7 million by 2050. About 20% of the population will be older than 65 years in 2030.[1] This statistic translates to more elderly patients requiring surgical care and more elderly trauma patients. The elderly have acquired abnormalities in platelets and coagulation factor function as well as an increased incidence of systemic disease. Elderly patients are also more likely to take anticoagulant or antiplatelet medications.[2] Approximately 1.5% of the US population is prescribed warfarin; however, patients 65 years or older have the highest use of this medication. Elderly anticoagulated patients make up 25% of all trauma-related deaths and have the highest rate of traumatic brain injury.[3] Therefore, it is essential to be familiar with congenital and acquired coagulopathies and the mechanism of action of the new oral anticoagulation medications.

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VASCULAR DISORDERS

The preoperative physical examination or trauma activation secondary examination may show evidence of an underlying disorder, including petechiae, purpura, or ecchymoses on extensor surfaces of the upper extremities or legs. These skin lesions are caused by increased transmural pressure, degeneration, and loss of dermal collagen, with resulting fragility of cutaneous small vessels. There may be no associated abnormality of platelet or the coagulation system with these skin lesions.[4]

Accumulation of monoclonal free light chain fragments occurs in amyloidosis. These deposits accumulate in the endothelium, resulting in loss of elasticity. The resultant vascular fragility can place the patient at increased risk for bleeding after trauma or surgical procedures.[5] Periorbital purpura is a common physical finding in patients with amyloidosis.[2]

Isolated elderly people can suffer from nutritional deficiencies. A vitamin C deficiency can lead to scurvy. Vitamin C is essential for collagen turnover, acting as a cofactor for the conversion of hydroxyproline to proline. Signs of scurvy include purpuric lesions on the legs and bleeding gums. This disorder can mimic vasculitis and bleeding disorders. Vitamin B_{12} and folic acid deficiency can lead to pancytopenia, including thrombocytopenia. Folic acid deficiency can occur within a month in hospitalized patients. Deficiency in vitamin B_{12} is unusual, because body stores can last 3 to 4 years before depletion. Underlying causes of vitamin B_{12} deficiency include malabsorption in the ileum, atrophic gastritis, partial or total gastrectomy, and pernicious anemia.[6]

COAGULATION FACTOR DISORDERS

Chronic liver disease can lead to decreased synthetic function and a reduction of all coagulation factors except for factor VIII, which is produced in liver sinusoidal cells and endothelial cells throughout the body. The severity of coagulation abnormalities is dependent on the degree of hepatic parenchymal damage and liver dysfunction.

In addition to vitamin C deficiency, elderly patients with a poor diet are at risk for vitamin K deficiency. Vitamin K is required for the γ carboxylation of coagulation factors II, VII, IX, and X, and proteins C and S. Malignancy, renal failure, and antibiotic therapy can interfere with vitamin K production by intestinal flora. Deficiency may result in a prolonged prothrombin time (PT) or increased international normalized ratio (INR).

Acquired Hemophilia

Late presentation of congenital bleeding disorders is a rare event. A detailed history should capture those with hemophilia A or B. Acquired hemophilia occurs with IgG1 and IgG4 autoantibodies to factor VIII. It is a rare condition, with 1 per million per year across all age groups, but it is more common in elderly patients, with an incidence of 7 per million per year older than 65 years.[2] This disorder is usually associated with autoimmune disorders, rheumatoid arthritis, systemic lupus erythematosus (SLE), and hematologic malignancies. Gastrointestinal bleeding, retropharyngeal and retroperitoneal hematomas, subcutaneous hematomas, cerebral hemorrhage, and urogenital tract bleeding are common, but the clinical manifestations can range from asymptomatic to life-threatening bleeding. Acquired hemophilia can be distinguished from congenital hemophilia, in which intra-articular and intramuscular hemorrhages are more common. Laboratory evaluation shows a prolonged activation of the partial thromboplastin time (aPTT). A Bethesda assay can quantify the inhibitor to factor