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Acute Immune Thrombocytopenia Purpura
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Introduction

Immune thrombocytopenia purpura (ITP), formerly known as idiopathic thrombocytopenic purpura, is a relatively rare but potentially life-threatening autoimmune disorder that involves the destruction of platelets by antibodies. ITP can result in a decreased platelet count that leaves the patient at risk for excessive bleeding and bruising (Hunt, 2010). ITP can occur in both adults and children, and also occurs as an acute or chronic disorder. It is thought that the cause of acute ITP may differ from that of chronic ITP, however, the underlying disease processes are similar (Johnson, 2012). Acute ITP is the most common form of the disease, most often occurring in children (Hunt, 2010). It is estimated that acute ITP occurs in as many as 6-10 per 100,000 children per year (Dorow, 2014). Most children diagnosed with acute ITP have a history of a recent viral infection, usually occurring three to four weeks prior to diagnosis. The incidence of cases are relatively mild and near 50% of those cases will resolve within two months. The most serious, but very rare, complication of ITP is intracranial hemorrhage (Maher, 2014).

Pathophysiological Processes

Acute ITP is a complex autoimmune disorder characterized by isolated thrombocytopenia. ITP can involve both increased platelet destruction and decreased platelet production. Increased platelet destruction is most commonly caused by autoantibodies. The most common autoantibody in ITP is antibodies against the glycoprotein (Gp) IIb/IIIa binding to glycoproteins, typically GPIIIa, on the platelet surface (Brissel, Sampey, & Segel, 2012). Igp that is bound to a platelet surface is recognized as an opsonin (a molecule that enhances phagocytosis) and is thus marked for an immune response) and induces increased platelet phagocytosis and destruction of the platelet microphages primarily occurring in the spleen (Luk & Li, 2014). Acute ITP is also an autoimmune condition, as the antibodies combine with the antigen to form an immune complex which leads to activation of complement, and results in phagocytosis and increased lysis of platelets (Johnson, 2012).

Acute ITP is often precipitated by a viral infection which is thought to trigger this autoimmune response. The concept of antigenic mimicry may occur in response to this viral infection. The antigens on the viral surfaces may closely resemble the antigens on the platelet surface leading to the antibodies recognizing the platelets as if present in viral removal by phagocytosis (Ahadi, Farcas, & Dhillon, 2011). Recent research has shown that with ITP, there is also a dysregulation of megakaryocyte and megakaryocyte cells in the bone marrow that breaks into fragments that become platelets. Megakaryocytes are also known to be involved in the immune response, where in the thymus, the Th2 cells are secreted by the liver in response to alteration in a foreign platelet count. This response is impaired in patients with the disease, but normal in healthy patients. An impaired production of the thrombopoietin alters in macrophages and a decreased production of platelets (Laherre & Geerts, 2013). The 14k carbohydrate may also bind with proteins on the membrane of megakaryocytes impairing the fragmentation of megakaryocytes into platelets and inducing apoptosis (Maher, 2014).

Case Study

A mother brought her previously healthy two-year-old son to his primary care provider with concerns about sudden onset of scattered bruising to his bilateral legs, arm, trunk, and purple flexures to his bilateral upper extremities, and a twenty-minute nosebleed. The patient’s mother denied that her son had experienced any pain, fever, fatigue, recent weight loss, headache, or recent trauma. The patient had a positive history of upper respiratory infection about three weeks ago per the patient’s mother. The patient’s mother revealed that he was currently not on any medication, no recent illness, no family history of bleeding disorders or coagulation.

On physical exam, the patient was noted to be very active with vitals within normal ranges for age. Temperature 99.5°F, heart rate 114 beats/minute, blood pressure 92/58, respiratory rate 28 breaths/minute, and oxygen saturation of 99% on room air. No pallor was noted, but significant scattered ecchymosis and petechiae were present to patient’s trunk and bilateral upper and lower extremities. The remainder of the physical examination was within normal limits, specifically, no hepatomegaly, splenomegaly, or hypothyroidism were noted (Laherre & Geerts, 2013).

A complete blood count (CBC) was obtained and examination of peripheral blood smear was performed (Laherre & Geerts, 2013). The patient’s CBC showed a normal hemoglobin (Hgb), 13.7g/dl, a decreased platelet count of 17,000/mm³, and a decreased white blood cell (WBC) count of 6,800/mm³, normal hematocrit (Hct) of 44.4%, and a decreased red blood cell (RBC) count of 4.14 million/mm³. The peripheral blood smear showed normal-appearing mature myeloid cells. The remainder of the bone marrow examination showed a nearly normal hematopoietic response with the exception of an increase in average platelet size (Maher, 2014).

Signs and Symptoms

ITP is often a diagnosis of exclusion and patients can present with a variety of symptoms. ITP is generally defined by a platelet count of less than 100,000/mm³ (Lo & Deane, 2014). The thrombocytopenia can be an incidental finding on a routine CBC since signs and symptoms associated with ITP may not be apparent until the platelet count falls below 30,000/mm³. Acute ITP usually has an abrupt onset of symptoms and can occur in otherwise healthy individuals (Klima, 2010). Common signs of ITP are easy bruising, petechiae, prolonged bleeding from cuts or surgical sites, gingival bleeding, and mucosal bleeding (Hunt, 2010). Blood may be present in the urine, stool, or sputum, but this is much less common (Klima, 2010). Intracranial hemorrhage is the most dangerous, but very rare complication of ITP. Individuals with intracranial hemorrhage may complain of headache, blurry vision, or display a change or more to lose of consciousness. Individuals that present with mucosal bleeding are more likely to experience intracranial hemorrhage (Hunt, 2010).

Nursing Implications

Acute ITP is an allergic disorder that is most often managed by primary care providers and pediatric hematology. All nursing professionals should have a working knowledge of the disease process because nursing of all levels and specialties may come in contact with this disease and be responsible for patient care. Acute ITP can be an exclusion and should be considered in patients with signs and symptoms of ITP. This process should involve a comprehensive medical history and identify the potential for this disorder and the need to implement appropriate testing and making recommendations for other management including possible referral to a specialist. Although ITP does not usually result in serious infection and complications do not present in these patients. Patients diagnosed with other autoimmune disorders are also at risk for developing ITP throughout their lifetime (Johnson, 2012). The increased risk for bleeding associated with ITP can also place patients at a much higher risk of developing bleeding complications from medical procedures (Rust, 2010). To implement appropriate nursing care, first, nurses should become familiar with the complications from these procedures, from the patient’s first encounter with the disease. All nursing professionals should have a general understanding of ITP. A primary care provider with the onset of symptoms should get a history and physical exam by a primary care provider with the onset of symptoms, including signs and symptoms of ITP. This primary care provider should then refer patients to a hematologist for appropriate testing and treatment of ITP.

Conclusion

ITP is an autoimmune disorder in which the body attacks its own platelets. It occurs in both an acute and chronic form. Acute ITP typically presents in children, but it can also occur in otherwise healthy children but can also occur in teenagers and adults of all ages. Acute ITP is associated with a sudden onset of symptoms (Maher, 2014). This disease is caused by an immune response to cells and tissues, it is a risk for bleeding and therefore, it is essential to understand the immune system. This disease is key to avoiding the potential complications. Further research needs to be conducted to develop and implement effective treatment for ITP.

References

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