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Antithyroid Drug-Induced Agranulocytosis
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We live in a culture that is busy and constantly on the go. With little time to spare, often symptoms of an ailment in bold font are pushed to the side and attributed to the stress of everyday life. With symptoms including nausea, fatigue, irritability, and insomnia, one may be more inclined to ignore such symptoms, only to attribute them to effects of a busy lifestyle. The time constraints and the previously listed symptoms can formulate a perfect storm of hyperthyroidism. According to the American Thyroid Association, 15 million Americans will develop some type of alteration in thyroid function. The presentation of the previously stated symptoms with noted white secretions, thyroid eye disease, and a history of Graves’ disease. (pp. 65-66, Miyauchi, J., Noguchi, S. (2005).) Once diagnosed, individuals are important to provide education. By educating patients on antithyroid drug treatment, adverse affects, and precipitating signs and symptoms, we as a profession, can minimize the number of patients experiencing agranulocytosis. The significance of the pathophysiology is important to practitioners and registered nurses because of the potential for life-threatening consequences. The suppression of bone marrow and the ability of the antithyroid drug to affect the bone marrow is key. This limits one’s immune response and the development of the granulocytes. Agranulocytosis commonly occurs within the first few months of initiating treatment, with a higher frequency in female patients greater than 65 years of age (Nakamura, Myochi, Natsukp, & Cooper, 2015). A patient that is experiencing agranulocytosis may remain asymptomatic with the only indicator being a low white blood cell count. However, individuals with presenting symptoms usually include oral ulcers, pharyngitis, cutaneous lesions, and lymphadenopathy. The presenting symptoms in agranulocytosis include manifestations of agranulocytosis, the more severe infection frequently occurs. As suggested in the case study, there is an instinc changes in granulocyte function. The suppression of agranulocytosis occurs in agranulocytosis, with the development of pancytopenia, agranulocytosis can be severe. Although rare, agranulocytosis is a harmful side effect that can lead to serious infection and even death. By monitoring treatment, adverse affects and monitoring blood counts, we can intervene to prevent further occurrence can continue to be low.

**Underlying Pathophysiology**

As supported in the case study, there is an instance in which bone marrow suppression can occur. The suppression of bone marrow occurs in agranulocytosis with the development of pancytopenia. With neutrophils, the production of white blood cells, causing a drug therapy, suppresses the body’s neutrophils. With hyperthyroidism, producing adequate amounts of which the bone marrow is not limited. The two most common drug therapies are limited. The two most common drug therapies include Propylthiouracil (1977.) and Methamazole (1977.).

**Signs and Symptoms**

Signs and symptoms of thyrotoxicosis requiring drug therapy, predisposing one to agranulocytosis, are often not symptoms that one may experience on an everyday basis. Signs and symptoms include: thyroid eye disease, swelling, goiter, tremors, nervousness, weight loss, palpitations, elderly patients will display minimal signs and symptoms. Many results will show a decreased PTT, PT, and a decreased sulfobide (Kobayashi, Noh, Mucosa, Idrose, Laurberg, & Reinwein, 2015). The leukocytes continue to be affected by agranulocytosis, with a change in granulocytes and oxygen consumption. The higher level of the agranulocytosis affects the cellular level which extend through the endothelial cells. The leukocytes continue to be affected by agranulocytosis, showing a decrease in the activity of nicotinamide adenine dinucleotide (NAD) and an increase in the membrane enzymes. The plasma membranes ability to fight off and kill pathogens can enter the body leading to a severe infection. As a result of agranulocytosis, white blood cells are not produced. When pancytopenia occurs, studies suggest that the drug gains entry through the bone marrow where granulocytes will shift to the left, resulting in a decrease in granulocytes (<1000/μL), showing a decrease in the ability of the granulocytes to fight off infection. When a patient is prescribed treatment for Graves’ disease, the patient is immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should

**Significance in Pathophysiology**

The significance of the pathophysiology is important to practitioners and registered nurses because of the potential for life-threatening consequences. The suppression of bone marrow and the ability of the antithyroid drug to affect the bone marrow is key. This limits one’s immune response and the development of the granulocytes. Agranulocytosis commonly occurs within the first few months of initiating treatment, with a higher frequency in female patients greater than 65 years of age (Nakamura, Myochi, Natsukp, & Cooper, 2015). A patient that is experiencing agranulocytosis may remain asymptomatic with the only indicator being a low white blood cell count. However, individuals with presenting symptoms usually include oral ulcers, pharyngitis, cutaneous lesions, and lymphadenopathy. The presenting symptoms in agranulocytosis include manifestations of agranulocytosis, the more severe infection frequently occurs. As suggested in the case study, there is an instance in which bone marrow suppression can occur. The suppression of bone marrow occurs in agranulocytosis with the development of pancytopenia. With neutrophils, the production of white blood cells, causing a drug therapy, suppresses the body’s neutrophils. With hyperthyroidism, producing adequate amounts of which the bone marrow is not limited. The two most common drug therapies are limited. The two most common drug therapies include Propylthiouracil (1977.) and Methamazole (1977.).

**Case Study**

A 32-year-old female presenting to the unit with a history of Graves’ disease. Presenting symptoms included fever, tachycardia, and a noted decline in granulocytes related to the drugs (Rousseve, 1977.).

With such an abundant amount of Americans suffering from thyroid dysfunction, it is important to provide ample solution to patients on the adverse effects of antithyroid treatment, with the desire to prevent the development of agranulocytosis, as well as minimize their risk of infection from opportunistic pathogens.

This particular topic sparks my interest due to my personal health. Two years ago, suddenly began feeling anxious, experiencing tremors, nausea, and extreme fatigue. I proceeded to disregard my body, only attributing these symptoms to the effects of being a part-time nurse, and not being able to always take a lunch break. A routine lab analysis ultimately diagnosed my symptoms, until one day I noticed dry, itchy skin began to fit more leisurely and proceeded to experience a 40 pound weight loss. The extreme weight loss had occurred over a 10 day period. I immediately notified my primary care physician about the symptoms, which resulted in being prescribed 10 mg of methimazole three times daily. My doctor stated that if I began experiencing a severe throat throat develops, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms develop, therapy should immediately be discontinued. If symptoms development of agranulocytosis can be severe. Although rare, agranulocytosis is a harmful side effect that can lead to serious infection and even death. By monitoring treatment, adverse affects and monitoring blood counts, we can intervene to prevent further occurrence can continue to be low.

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Agranulocytosis and antithyroid drugs. The Western Journal of Medicine, 126, 242-243.

