Chapter 1

AN OVERVIEW THE BLOOD HISTOLOGY AND CHRONIC MYELOID LEUKEMIA ASSOCIATED WITH DNA REPAIR GENE POLYMORPHISMS

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Introduction

Blood plays a key role in the fulfillment of many important functions in the body. Blood histology is a special area of histology where many biological parameters are physiologically modified. The disruption of the blood cells that make up the cellular part of the blood stems from problems regarding cells known as red blood cells, white blood cells and thrombocytes. These special blood cells are produced according to the needs of the body, and when the control mechanisms of the blood cells deteriorate, it is possible for the cells to grow to an extreme extent, and as a result blood diseases can occur. Knowing the blood histology is important for easier understanding of blood diseases. Hematology is a discipline that examining the blood diseases such as thrombocytopenia, anemia, lymphoma, multiple myeloma (Engert et al., 2016).

Leukemia from blood diseases is a disease characterized by neoplastic proliferation of various cell types such as granulocyte, monocyte, lymphocyte. Chronic myeloid leukemia (CML), a type of leukemia, is a myeloproliferative neoplasm and is characterized by the Philadelphia chromosome (Ph) (Pockharel, 2012; Jabbour & Kantarjian, 2012).

Common genetic polymorphisms in DNA repair genes that are thought to play an important role in the development of CML can affect protein function and DNA damage capacity. As a result, genetic instability and leukogenogenesis can occur. These polymorphisms, which reduce the kinetics of the DNA repair mechanism, are associated with cancer susceptibility, such as leukemia (Mohrenweiser, Wilson & Jones, 2003).

Identification of genetic polymorphisms that play an important role in the development of CML, one of the leukemia varieties, is important for our knowledgement of the mechanism of CML disease. Determining the relationships between genetic polymorphisms of DNA repair genes that are thought to play a role in disease mech-

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with eosin. In addition to erythrocytes, leukocytes are visible which are subdivided into two groups; granulocytes and agranulocytes. Granulocytes are neutrophils, eosinophils and basophiles. Neutrophils have several lobulated nuclei and fine pink granules in their cytoplasm. Eosinophils can be identified with their cytoplasms that are full of distinct, large, eosinophilic (bright pink) granules. The nuclei of eosinophils typically is bilobed. The basophils are few in number. They contain nuclei which is not markedly lobulated and stained pale basophilic. Monocytes are the largest leukocytes. Their nuclei are usually horseshoe-shaped. Lymphocytes have few or no cytoplasmic granules and exhibit darkly stained round nuclei. Several tiny platelets are visible in the blood smear.

A blood cell disorder is the consequences of a problem with your red blood cells, white blood cells, or the smaller circulating cells called platelets, which are critical for clot formation. Leukemia, thrombocytopenia and anemia important blood diseases. Hematology is related with lymphoma, multiple myeloma, acute and chronic leukemia and similar disorders; bone marrow, lymphatic system and blood-related diseases. A large proportion of hematologic diseases have vital importance. Knowing blood tissue histology is very crucial for all hematologic diseases. In this chapter, general information about CML has been given from diseases that arise as a result of disorders that occurring in the cellular components of the blood, based on histology of blood tissue. An examination of genetic polymorphisms that play an important role in the development of CML blood disease will be crucial in order to have knowledge about the mechanisms that may lead to the disease and to use this information to develop new treatments for the disease.

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