بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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لم ترد بالاصل

Cytochemical Markers in Acute Leukemias

THESIS

Submitted in Partial Fulfillment of the Requirements for the

Master Degree in Clinical Pathology

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TO MY LOVELY FAMILY:

TAREK & ABDULLAH

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Leukemias are a group of malignant disorders characterized by progressive, uncontrolled proliferation of hemopoietic cells, at different stages of cell maturation. Leukaemias were classified by the FAB (French-American-British) group parameters according to the clinical course of the disease (acute and chronic) and according to type of cell involved lymphoid, myeloid, monocytic, erythroid, or megakaryocytic. Besides morphology of the cells involved, and because sometimes, it is very difficult to discriminate between the different types of acute leukemia, various laboratory procedures have been developed in order to reach the proper diagnosis of the case. Among these procedures are various cytochemical reactions.

This study aims at application of various cytochemical techniques for identification and classification of acute leukemias. Also these cytochemical tests help prediction of prognosis and planning of proper chemotherapy.

REVIEW OF LITERATURE

DEFINITION

AND CLASSIFICATION OF LEUKEMIAS

Leukemias are a group of diseases in which the common manifestation is a malignant unregulated proliferation of cells endogenous to the bone marrow. Leukemia may involve any of the blood forming cells or their precursors. Although each type of leukemia progresses differently, the unregulated proliferating cells:

1- Usually replace normal marrow.

2- Eventually interfere with normal marrow function.

3- May invade other organs.

4- Eventually cause death if not treated.

The leukemias were first described in 1845. The chronic leukemias were first to be characterized. Bennett in 1945 and Wirchow in 1946 noticed large spleens and white blood at autopsy of patients who had died of an uncharacterized chronic disease of 1-2 years duration. Wirchow's description of white blood was subsequently translated into the *Greek word leukemia* (Gunz; 1980). Acute leukemia was described about 25 years later when patients with white blood were noted to die rapidly, not after a long debilitating illness (Friedreich, 1957 and Ebstein, 1889). It was not until 1877, when Ehrlich, 1891, developed a stain that allowed microscopic evaluation of white blood cells, that it was realized that white blood was caused by increase number of white corpuscles. Later in 1900's, it was established that acute and chronic leukemias involved different types of white blood cells (Gunz 1980). In the chronic leukemias white blood was made up of mature cells while acute leukemia involved immature cells, or blasts. Since 1900's, leukemias have been studied with the microscope, cytochemical stains, electron microscopy, immunologic, nuclear and surface markers, and cytogenetic techniques.

CLASSIFICATION OF LEUKEMIAS

I- Hayhoe and Dameshek Classification(1964)

Leukemia being subjected to considerable variations in the growth pattern and in the growth rate may be classified ;

A) *According to the course of the disease* :

Despite continued studies and subclassification, leukemias are still generally divided into :

* *Acute leukemia* ;

Large number of undifferentiated primitive cells in the bone marrow and blood resulting from either maturation arrest or an increased growth with little time for differentiation or maturation (Lee et al, 1961). It is characterized by abrupt onset of clinical symptoms (fever, hemorrhage, weakness), and death occurs within months if treatment is not instituted. Acute leukemia occurs both in children and in adults. Thrombocytopenia is usually found in patients with acute leukemia. Anemia and neutropenia are also hallmarks of the acute leukemias. Blasts or immature cells populate the bone marrow and constitute at least 30 percent of all nucleated bone marrow cells (Bennett et al, 1985).

* *Chronic leukemia* :

It is characterized by the insidious onset of symptoms (weakness, pallor, enlargement of spleen and liver), and the death occurs years after the diagnosis. Chronic leukemia usually occurs in adults. In patients with chronic leukemia, thrombocytopenia is rare until late in the course of the disease. Initially platelets seem normal or increased. Leucocytosis and anemia are usually present. Bone marrow is infiltrated by an increased number of mature cells or cells with recognizable counter part of normal maturation (Simone, 1978.)

B) According to the leucocytic count : we may get:

* - Leukemic leukemia: with high leucocytic counts representing the classical leukemic picture.

* - Subleukemic leukemia: with normal or low leucocytic counts, but with abnormal differential counts showing primitive leucocytes.

* - Aleukemic leukemia: in which there is a normal or usually low leucoytic counts but with no abnormal or primitive cells in differential counts.