

عنوان مقاله:

Diagnosis of B-CLL Leukemia Using Fractal Dimension

محل انتشار:

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خلاصه مقاله:

Background: Leukemia is cancer of blood and bone marrow cells. In general, there are four types of leukemia: chronic myelogenous leukemia (CML), acute myeloid leukemia (AML), B-cell chronic lymphocytic leukemia (CLL) and acute lymphoblastic leukemia (ALL). Fractal geometry can be introduced as one of the effective ways to detect this type of cancer. In this study, with introducing an effective method, it is tried to predict CLL cancer through the measurement of nucleus cell fractal dimension. **Methods:** Blood samples of 30 healthy individuals and 30 patients with blood cancer were taken and digital pictures were taken from the samples with 100X optical microscope. Finally, nucleus cells fractal dimension was calculated with box counting method and the obtained data were analyzed through statistical software. **Results:** Mean fractal dimension of lymphoma type B cell was 1.367 ± 0.001 in healthy subjects and 1.398 ± 0.006 in cancer patients. The difference between healthy cells and cancer cells fractal dimension is significant. **Conclusion:** Fractal dimension measurement can be used to screen cancer cells from healthy cells. The detection point for identification of CLL cancer by fractal dimension method was introduced as 1.3 (the middle point of normal cells and cancer cells fractal dimension). In the case of blood cell fractal dimension higher than 1.383, the patient is suspected to have CLL blood cancer.

کلمات کلیدی:

Fractal dimension, Predict, Detect, CLL Blood Cancer, Box Counting

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