Annals of Clinical and Analytical Medicine
Letter to Editor

The assessment of computational intelligence technique for the diagnosis of acute lymphoblastic leukemia

Artificial intelligence and leukemia

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To the editor:
Artificial intelligence, first defined by McCarthy in 1956, is defined as the science in which technology is used to simulate human-like behavior and reasoning ability [1]. Studies on the use of artificial intelligence applications in the field of medicine are increasing day by day. There are also studies in the literature on the possible contributions of artificial intelligence use in the field of hematology, especially in the diagnosis phase. Leukemias are mainly divided into two groups in hematology: acute and chronic leukemias. Acute leukemias are characterized by more than 20% blasts in the blood or bone marrow blood. Acute leukemias can be classified as myeloid (AML) and lymphoid (ALL) based on the cell type from which they originate. Acute lymphoblastic leukemia (ALL): Since it has a high mortality rate and is highly treatable when diagnosed early, being quick in diagnosis is an important point. Although technologies such as flow cytometric methods are used in diagnosis, definitive diagnosis is still based on microscopic examination. There are articles in the literature on artificial intelligence applications in ALL diagnoses. Alaoui et al. reported that artificial intelligence was used for ALL diagnoses with a database created using patients' complete blood count, and a high accuracy rate (91.4%) was achieved [2]. Rizayi et al. reported that artificial intelligence was used for ALL diagnoses with a database created using patients' peripheral smear images [3]. Shafique et al. showed that in 2018, artificial intelligence systems were used for both automatic ALL diagnosis and determination of its subtypes (L1, L2, and L3) [4]. If artificial intelligence applications will be used at the time of diagnosis, especially in hematological malignancies where definitive diagnosis with microscopy is still the gold standard, the data to be used should not be only microscopic images or only complete blood count results. In addition to both microscopic images and complete blood counts, studies are needed with artificial intelligence versions that will be developed by including patient gender, nationality, and patient health status diversity. In artificial intelligence applications used for diagnosis, an infrastructure that not only allows for general ALL diagnosis but also for determining its subtypes may be more useful. Artificial intelligence can be used to support doctors in the triage process, to reduce the number of unnecessary referrals to hematology clinics in tertiary hospitals, and to provide rapid and adequate intervention for ALL suspected cases that require advanced examination. After the ALL diagnosis, artificial intelligence can make a significant contribution to clinicians in planning patient-based treatment, and studies on this subject are needed.

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How to cite this article:
Fatma Yılmaz. The assessment of computational intelligence technique for the diagnosis of acute lymphoblastic leukemia. Ann Clin Anal Med 2025;16(Suppl 2): DOI: 10.4328/ACAM.22471

DOI: 10.4328/ACAM.22471 Received: 2024-10-31 Accepted: 2024-12-02 Published Online: 2025-01-14 Printed: 2025-05-25 Ann Clin Anal Med 2025;16(Suppl 2): DOI: 10.4328/ACAM.22471
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