

Exploring CD36 Expression in Adult B-acute lymphoblastic leukemia: Insights into Genetic Risk and Treatment Response.

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Background: CD36, a surface glycoprotein commonly found on platelets, monocytes, and erythroid progenitor cells, is less frequently expressed on B-lymphoblasts. We investigated the frequency of CD36 expression in adult B-cell acute lymphoblastic leukemia (B-ALL) blasts and its association with clinical, immunophenotypic, genetic features, and minimal residual disease (MRD) status.

Methods: We retrospectively analyzed 647 adult B-ALL cases diagnosed at our institute between October 2018 and September 2023. Clinical laboratory parameters, bone marrow findings, immunophenotyping results, cytogenetic and molecular genetic profiles, and MRD levels from flow cytometry were recorded and evaluated.

Results: Our cohort included 647 adult B-ALL cases with a mean age of 41 years (range: 14–78 years) and a male-to-female ratio of 1.6:1. CD36 expression was observed in 43/577 cases (7.45%). CD36-positive cases exhibited significantly less severe thrombocytopenia, with a median platelet count of 41,000/ μ L (IQR: 19,000–98,000) compared to 24,000/ μ L (IQR: 12,000–57,000) in CD36-negative cases ($p=0.05$). Leucopenia was present in 21.8% of CD36-negative cases compared to 9.3% of CD36-positive cases ($p=0.05$). No significant differences were observed in hemoglobin levels, total leukocyte counts, or peripheral blood blast counts.

Immunophenotypic analysis revealed that CD36 expression was significantly associated with CD20 (79% in CD36-positive vs 61.5% in CD36-negative cases, $p=0.02$) and CD123 positivity (57.5% vs 39.7%, $p=0.04$) in leukemic B-blasts. CD36 expression was also linked to the presence of the *BCR::ABL1* p210 transcript (76.5% in CD36-positive vs 45.9% in CD36-negative cases, $p=0.02$). High-risk genetic features, such as *BCR::ABL1*, *BCR::ABL1-like*, and *KMT2A* rearrangements, were more prevalent in CD36-positive cases compared to CD36-negative cases (75% vs 32.7%, $p=0.015$). Furthermore, CD36-positive cases showed a higher rate of end-of-induction MRD positivity (77.3% vs 40.7%, $p=0.001$).

Conclusion: CD36 expression in adult B-ALL was significantly associated with distinct laboratory, genetic, and MRD response profiles, highlighting its potential role as a prognostic marker.