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## **Prognostic Significance of CD79a Expression in Paediatric B-Cell Acute Lymphoblastic Leukaemia: Implications for Risk Stratification and Therapeutic Targeting**

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**Introduction:** Acute lymphoblastic leukemia (ALL) is the most common childhood cancer, with B-cell ALL (B-ALL) being predominant. Despite treatment advances, relapse remains a challenge.

**Methodology:** The evaluation of cytoplasmic CD79a expression was conducted on bone marrow samples from 331 pediatric patients diagnosed with (B-ALL) at diagnosis. A comprehensive panel of immunophenotyping was performed on the bone marrow samples. Cytoplasmic CD79a phycoerythrin was quantified by percentage positivity and median fluorescent intensity (MFI) relative to the isotype control (ISO). The correlation between CyCD79a expression and clinical outcomes was evaluated.

**Results:** Overall survival (OS) for the entire cohort was 69.8% and disease-free survival (DFS) was 90.6%. Median CD79a expression was 43% in the entire cohort. Patients with CD79a  $\geq$  43% had significantly poorer OS (50.2%) compared to those with CD79a < 43% (49.8%,  $P < 0.001$ ). Similar trends were observed with CD79a MFI, MFI-Isotype control, and MFI/Isotype control using a median cut-off of  $\geq 77$ , 60, 15, and 4.8, respectively. DFS was lower in patients with CD79a  $\geq$  43% (52.5%) compared to those with CD79a < 43% (86.1%,  $P < 0.001$ ). Patients with high CD79a MFI, MFI-Isotype control, and MFI/Isotype control had lower DFS compared to those with lower values ( $P < 0.001$  for all comparisons).

Cox regression survival analysis was conducted to identify prognostic factors affecting Disease-Free Survival (DFS). The analysis revealed that a CD79a percentage  $\geq 73.5\%$  is a statistically significant prognostic factor, with a hazard ratio (HR) of 6.348 (95% CI: 2.191–18.396,  $p = 0.001$ ). This indicates a higher risk of adverse outcomes associated with higher CD79a levels. On multivariate analysis using Cox-proportional hazard regression model; the independent factors that significantly affect the overall survival (OS) were age and CD79a. Also patients with positive CD79a had worse OS compared to those with negative CD79a (HR: 2.0 [95%CI:1.0-4.1],  $p=0.045$

**Conclusion:** CD79a is a significant prognostic marker in paediatric B-ALL.