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Estimation of stem cell frequency in acute myeloid leukemia at diagnosis: Relation to hematological and clinical parameters

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Background: Acute myeloid leukemia (AML) outcome is inferior to acute lymphoblastic leukemia. Treatment failure is largely attributed to the persistence of leukemia stem cells (LSCs) which are less accessible and hence less responsive to chemotherapeutics.

Aim: To demonstrate the impact of LSCs frequency at diagnosis and at follow up periods as compared to minimal residual disease (MRD) on overall survival (OS) and disease free survival (DFS).

Methods: The study was performed on 84 adult AML patients. Panels used CD38FITC/CD123PE/CD34ECD/CD45PE-PC5 and CD90FITC/CD133PE/CD45ECD/CD33PE-PC5 analyzed on Navios Flow cytometer. Cell populations with different surface markers were calculated using the prism function of the software. The study was performed according to Helsinki declaration for studies on human subjects and approved by the Institution Review Board (IRB) of the National Cancer Institute, Cairo University. An informed signed consent was obtained from all study subjects before enrollment.

Results: A higher CD 123% at diagnosis ($p \leq 0.001$) and at day (d) 14 ($p=0.004$ & $p \leq 0.001$ respectively) had an adverse impact on OS and DFS. A higher CD 133% at diagnosis and at d14 ($P=0.006$ & $P \leq 0.001$ and $P \leq 0.001$ & $P \leq 0.001$ respectively), had an adverse impact on OS and DFS. A higher [CD34-/CD38+/CD123+] percentage at diagnosis ($P=0.025$ and $P \leq 0.001$) had adverse impact on OS and DFS at d14 ($P=0.029$) had adverse impact only on DFS.

Conclusion: High frequency of LSCs reflects a higher percentage of chemotherapy resistant cells that will lead to the outgrowth of MRD, thereby affecting clinical outcome.

Biography

Eman Kandeel has completed her MD in 2011 from NCI, Cairo University, Egypt. She has experience of Flow Cytometry from Roswell Park Cancer Institute, Buffalo, New York. She is a Lecturer at BMT lab Clinical Pathology Department from 2011 to till date.

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