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613.ACUTE MYELOID LEUKEMIAS: CLINICAL AND EPIDEMIOLOGICAL

Hyperleukocytosis Does Not Present a Worse Prognosis in Acute Myeloid Leukemia (Non-APL) with Favorable Risk According to ELN-2022 Criteria: A Retrospective Study

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Introduction: Acute myeloid leukemia (AML) with hyperleukocytosis, characterized by a white blood cell count ≥100,000/μL, is usually considered a subtype associated with poor prognosis. For AML patients with hyperleukocytosis, more aggressive treatment approaches, such as allogeneic hematopoietic stem cell transplantation (allo-HSCT), are commonly considered. However, when favorable-risk AML accompanies hyperleukocytosis, it is unclear whether the risk level needs to be redefined. There is also no universally accepted treatment strategy for this subtype. We conducted a retrospective, single-center study to investigate the impact of hyperleukocytosis on the response and prognosis of favorable-risk AML according to ELN-2022 risk classification.

Method: We retrospectively enrolled 217 favorable-risk AML patients, excluding acute promyelocytic leukemia (APL), treated at Zhejiang University School of Medicine's First Affiliated Hospital from October 1st, 2021, to April 30th, 2023. Some of them have been treated in other hospitals. The diagnosis, risk classification, and response evaluation were determined according to ELN-2022 criteria. Patients were divided into two groups: the hyperleukocytosis group (white blood cell count ≥100,000/μL) and the non-hyperleukocytosis group (white blood cell count <100,000/μL). We compare these two groups on the response rate after the induction chemotherapy, the median overall survival (mOS), and median disease-free survival (mDFS), then evaluate different treatments and other prognostic factors associated with outcomes. Statistical analyses were carried out using SPSS 24.0. The Kaplan-Meier method and log-rank test were used to assess and compare the survival outcomes. Univariate Cox proportional hazards regression was used to determine associated risk factors for overall survival. A two-tailed P value <0.05 was considered statistically significant.

Result: Totally 217 patients were enrolled. To balance the impact factors, 12 patients who received high-dose cytarabine were excluded from the non-hyperleukocytosis group. The cohort ready for analysis had 45 patients in the hyperleukocytosis group and 160 patients in the non-hyperleukocytosis group. Two groups had no significant differences in age; gender, FAB classification; platelet counts and hemoglobin level at initial diagnosis; co-existing intermediate/high-risk mutations according to 2022 ELN risk stratification; treated with high-dose cytarabine, or receiving bone marrow transplantation (all P>0.05). The median follow-up time was 29.5 months, and 154 patients were still alive at the study endpoint. There were no significant differences in the composite complete remission (CRc) rates (73.3% vs. 79.3%, P= 0.389), mOS (65.0m vs. 56.0m, P= 0.574), and mDFS (54.0m vs. 35.0m, P= 0.855) between two groups. With high-dose cytarabine (2.0-3.0 g/m2 q12h X 3 days for at least three courses) as consolidation chemotherapy, the two groups had no significant difference in mOS (Not reached vs. Not reached, P=0.143) and mDFS (21.0m vs. 35.0, P= 0.352). In order to understand the impact of allo-HSCT on the

hyperleukocytosis group, we divided this group into the allo-HSCT subgroup and the non-HSCT subgroup. After balancing on age, gender, presence of high-risk mutations, and MRD negativity after the first remission (all P>0.05), the mOS in the allo-HSCT subgroup (n=16) was significantly longer than the non-HSCT subgroup (n=16) (Not reached vs. 46.0m, P= 0.007). However, the mDFS had no significant difference between the two sub-groups (63.0m vs. 43.0m, P= 0.341). The univariate Cox proportional hazards regression analysis revealed that only age had a significant impact (P= 0.01), all other factors had no significant effects, including hyperleukocytosis, gender, hemoglobin level, platelet count, intermediate/high-risk mutations, or bone marrow transplantation.

Conclusion: In favorable-risk AML, hyperleukocytosis does not lead to an adverse prognosis. Received high-dose cytarabine as a consolidation therapy, favorable-risk AML patients with hyperleukocytosis do not have worse OS or DFS than those without hyperleukocytosis. Allo-HSCT may bring longer OS for hyperleukocytosis patients at favorable risk but may not bring longer DFS. Our results suggest favorable-risk AML patients with hyperleukocytosis can be managed equally as non-hyperleukocytosis patients.

Disclosures No relevant conflicts of interest to declare.

Table. Patients' clinical characterisitics, response and survival assessments

	Hyperleukocytosis Group(n=45)	Non-hyperleukocytosis Group(n=160)	P value
Age			0.576
Average	45(18-72)	47(18-72)	
Gender			0.092
Male	30(67%)	84(52.5%)	
Female	15(33%)	76(47.5%)	
FAB Classification[a]			0.661
M0	1(2.2%)	10(6%)	
M1	10(22.2%)	3(1.9%)	
M2	13(28.9%)	87(54.4%)	
M4	4(8.8%)	17(10.6%)	
M5	17(37.8%)	52(32.5%)	
M6	0(0)	0(0)	
M7	0(0)	0(0)	
Platelets Count(×10⁹)[b]	58.3	62.5	0.696
Hemoglobin Level(g/L)[c]	92.2	87.2	0.152
Intermediate/High-risk Mutations[d]			0.991
Yes	38(84.4%)	135(84.4%)	
No	7(15.6%)	25(15.6%)	
High-dose Cytarabine Treatment			0.064
Yes	23(51.1%)	106(66.3%)	
No	22(48.9%)	54(33.7%)	
Allo-HSCT[e]			0.126
Yes	22(48.9%)	58(36.3%)	
No	23(51.1%)	102(63.7%)	
Response			0.389
CR±(CR+CRi)	33(73.3%)	127(79.3%)	
CR	19(42.2%)	62(38.7%)	
CRi	14(31.1%)	65(38.6%)	
NR	12(26.7%)	33(20.7%)	
1-year OS rate	81.9%±5.8%	89.2%±2.5%	
2-year OS rate	77.8%±6.8%	74.0%±3.9%	
Median Overall Survival Months(95% CI)	65.0(31.1-98.9)	56.0(42.7-69.3)	0.573
Median Disease-free Survival Months(95% CI)	54.0(0.0-136.7)	35.0(0.0-94.6)	0.855

[a]FAB Classification: French–American–British classification systems,a series of classification diagnostic criteria for acute leukemia;
[b]Platelets Count: Peripheral blood platelets count at initial diagnosis;
[c]Hemoglobin Level: Peripheral blood hemoglobin level at initial diagnosis;
[d]Intermediate/High-risk Mutations: According to the 2022 European Leukemia Net (ELN) risk stratification;
[e]Allo-HSCT: allogenetic hematopoietic stem cell transplantation.

Figure

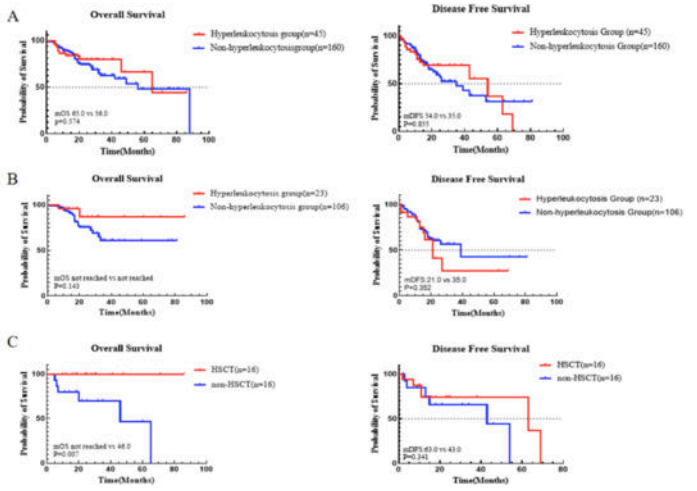

Figure. A Kaplan-Meyer analysis of overall survival and disease-free survival in the hyperleukocytosis and non-hyperleukocytosis groups. B Kaplan-Meier analysis of overall survival and disease-free survival on patients who received high-dose cytarabine as consolidation chemotherapy and compared between the hyperleukocytosis and non-hyperleukocytosis groups. C Kaplan-Meier analysis of overall survival and disease-free survival on hyperleukocytosis AML patients and compared between allo-HSCT and the non-HSCT group after balancing for age, gender, high-risk mutation status, and MRD status at first remission.
Allo-HSCT: allogenetic hematopoietic stem cell transplantation.

Figure 1

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