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ORIGINAL STUDY: RETROSPECTIVE STUDY

Survival analysis of older patients with non-M3 acute myeloid leukemia at a tertiary care hospital in Ecuador.

Análisis de supervivencia de pacientes mayores con leucemia mieloide aguda no M3 en un hospital de tercer nivel en Ecuador.

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ABSTRACT

INTRODUCTION: Outcomes in older adult patients with non-M3 acute myeloid leukemia (AML) have generally been poor. This study presents the first survival analysis of elderly patients with non-M3 AML at a tertiary care hospital in Quito, Ecuador.

OBJECTIVES: To describe the overall survival (OS) of patients ≥ 65 years diagnosed with AML between January 2012 and December 2019 (pre-COVID-19 pandemic period).

MATERIALS AND METHODS: A retrospective review was conducted of medical records from patients ≥ 65 years diagnosed with non-M3 AML between 2012 and 2019, followed up until December 2021. A survival analysis was performed and its relationship with clinical and demographic variables.

RESULTS: A total of 100 patients were included, with a median age of 74 years. Of these, 77 patients (77%) had de novo AML, and 23 (23%) had secondary AML. Forty (40%) patients received intensive chemotherapy (IC); 34 (34%) patients received low-dose ARA-C, and 17 (17%) received supportive care only. The overall survival at 1 year for all patients was 16%; median survival was 5 months in the intensive chemotherapy group, 3 months in the low-dose ARA-C group, 1 month in the supportive care only group, 3 months in the secondary AML group, and 3 months in the de novo AML group. A leukocyte count ≥ 40,000/mm^3 at diagnosis was negatively associated with OS (HR 2.81 [95% CI 1.60-4.02], $p < 0.01$), while receiving intensive chemotherapy was positively associated with OS (HR 0.35 [95% CI 0.19-1.63], $p < 0.01$).

CONCLUSIONS: The poor outcomes in these patients are lower than those reported in other real-world studies with conventional treatments. In our setting, improving survival in elderly AML patients could be related to improvements in patient support and care

KEYWORDS: Leukemia, Myeloid, Acute/drug therapy; Aged; Survival Analysis; Tertiary Healthcare; Drug Therapy; Complications

RESUMEN

INTRODUCCIÓN: los resultados en pacientes adultos mayores con leucemia mieloide aguda (LMA) no M3 han sido generalmente pobres. Este estudio presenta el primer análisis de supervivencia de pacientes ancianos con LMA no M3 en un hospital de tercer nivel en Quito, Ecuador.

OBJETIVOS: describir la supervivencia global (SG) de los pacientes ≥ 65 años que fueron diagnosticados de LMA en el periodo de enero de 2012 y diciembre de 2019 (periodo previo a la pandemia de covid-19).

MATERIALES Y MÉTODOS: se revisaron retrospectivamente los registros médicos de pacientes ≥ 65 años diagnosticados con LMA no M3 entre 2012 y 2019, seguidos hasta diciembre de 2021. Se realizó un análisis de supervivencia y su relación con variables clínicas y demográficas.

RESULTADOS: se incluyeron 100 pacientes, con una mediana de edad de 74 años. 77 pacientes (77%) tenían LMA de novo y 23 (23%) LMA secundaria. 40 (40%) pacientes recibieron QT intensiva; 34 (34%) pacientes recibieron ARA-C bajas dosis, 17 (17%) solo recibieron soporte. La SG a 1 año de todos los pacientes fue de 16%; las medianas de supervivencia fueron: 5 meses en el grupo con quimioterapia (QT) intensiva; 3 meses en el grupo de ARA-C bajas dosis; 1 mes en el grupo de solo soporte; 3 meses en el grupo de LMA secundaria; 3 meses en el grupo de LMA de novo. Al debut ≥ 40.000 leucocitos/mm^3 se asoció adversamente a la SG, (HR 2.81 [IC del 95%, 1.60-4.02], $p < 0.01$), mientras que el recibir QT intensiva se asoció favorablemente con las SG, (HR 0.35 [IC al 95%, 0.19-1.63], $p < 0.01$).

CONCLUSIONES: los resultados pobres en estos pacientes son más bajos a los documentados en otros reportes del mundo real con tratamientos convencionales. En nuestro medio se podría considerar que la mejora en la SG en la LMA del anciano estaría condicionada a las mejoras del soporte y acompañamiento del paciente.

PALABRAS CLAVE: Leucemia Mieloide Aguda/tratamiento farmacológico; Anciano; Análisis de Supervivencia; Atención Terciara de Salud; Quimioterapia; Complicaciones.

INTRODUCTION

Acute myeloid leukemia (AML) is the most common type of acute leukemia among adults, with an age-adjusted incidence of 3.66 per 100,000 per year in the U.S.[1]. Older adults are the most frequently affected group, with a median age at diagnosis of 69 years in North America and Europe[2-4].

The Surveillance Epidemiology and End Results (SEER) program reported a 1-year relative overall survival rate of 26.7% and a 5-year relative survival rate of only 8.1% for patients ≥ 65 years in the U.S., compared to a 5-year relative survival rate of up to 56.9% for patients < 50 years[1,4]. In general, the low survival in older adult patients reflects the higher frequency of unfavorable prognostic factors and comorbidities, as well as a preference among physicians not to treat older patients with aggressive chemotherapy regimens, due to the perspective that they are less likely to benefit from intensive therapies[5].

Poor outcomes in older adult patients diagnosed with non-M3 AML have been documented in several reports; however, there is no data on this population in Ecuador. The objective of this study was to describe the median overall survival of patients ≥ 65 years diagnosed with AML between January 2012 and December 2019 (pre-COVID-19 pandemic period) and its relationship with age, sex, type of AML, place of residence, leukocyte count at diagnosis, and type of treatment received. Secondary objectives were to analyze risk factors for early mortality at 2 months from diagnosis and 2 months after treatment initiation, and to describe the main clinical and demographic variables in this population from the Hematology Unit at Carlos Andrade Marín Hospital, with a follow-up period extending until December 31, 2021.

METHODS

Design and Patient Selection

This is a retrospective longitudinal observational study conducted at a tertiary referral center in Quito, Ecuador, which included patients ≥ 65 years old who were diagnosed with AML between January 2012 and December 2019 (pre-COVID-19 pandemic period). The most important clinical and demographic characteristics, therapeutic regimens, and main clinical outcomes were recorded.

All patients were diagnosed with AML if they had at least 20% blasts in blood or bone marrow, as FISH or RT-PCR for t(8;21) or inv(16)/t(16;16) translocations were unavailable. The origin of the myeloid cells was confirmed in all cases by immunophenotypic analysis with flow cytometry. Patients with acute promyelocytic leukemia and those with isolated extramedullary AML were excluded from the analysis.

Study Assessments and Definitions

The induction regimens for patients who received intensive chemotherapy were as follows: 7+3 (continuous infusion of cytarabine [dose: 100-200 mg/m²] on days 1 to 7 and an anthracycline on days 1 to 3) and 5+2 (continuous infusion of cytarabine [dose: 100-200 mg/m²] on days 1 to 5 and an anthracycline on days 1 and 2). Patients who received consolidation therapy after achieving complete remission (CR) were given high-dose cytarabine (doses >1 g/m² on 6 doses on alternate days). Patients who completed the consolidation phase received maintenance treatment with low-dose subcutaneous cytarabine (100 mg once daily for 5 days) every month for 2 years.

Complete remission (CR) was defined according to Cheson et al. criteria (<5% blasts in bone marrow, trilineage hematopoiesis, neutrophil count >1000/mm³, platelet count >100,000/mm³; absence of blasts in peripheral blood and/or extramedullary disease)6. Induction-related mortality was defined as death from any cause occurring within the first month after initiating intensive induction chemotherapy. Treatment-related mortality was defined as death from any cause occurring during first-line intensive chemotherapy. Overall survival (OS) was defined as the time from diagnosis to death or last follow-up. Patients for whom relapse or death was unknown were censored at the last recorded follow-up.

Patients who received non-intensive chemotherapy were those treated with low-dose subcutaneous cytarabine (100 mg once daily for 5 days every month until intolerance) or mercaptopurine 100 mg daily. Patients receiving only supportive care did not receive chemotherapy and only received hemocomponent transfusions until death.

Statistical Considerations

Absolute and relative frequencies of clinical data were described. A logistic regression analysis was performed for factors related to early mortality at 2 months. OS outcomes were analyzed using the Kaplan-Meier method at 1 and 2 years, and median OS times were compared using the log-rank test. Prognostic factors associated with OS were analyzed using a Cox regression model, and the effect size of the outcome is presented as Hazard Ratio (HR). All analyses were performed using R version 4.1.2 (R Foundation for Statistical Computing, Vienna, Austria). The study was approved by the ethics and research committee of the center where this study was conducted.

RESULTS

Patient characteristics

During the study period, 243 patients ≥ 15 years old were diagnosed with AML, of which 100 (41.1%) were ≥ 65 years old. This group had a median age of 74 years (range 65-95). 62 (62%) patients were female; 77 (77%) patients had de novo AML, and 23 (23%) had secondary AML. Other patient characteristics, divided according to the type of treatment received are presented in Table 1.

Patients Who Received Intensive Chemotherapy

40 patients received intensive chemotherapy. CR was achieved in 9/40 (22.5%) patients. 11 (27.5%) patients received the 7+3 chemotherapy protocol and the rest of the patients received the 5+2 chemotherapy protocol, achieving CR in 3 (27.2%) and 6 (20.6%) patients respectively.

Table 1. Epidemiological and clinical variables.

	All patients n(%)	Palliative chemotherapy or support n(%)	Intensive chemotherapy n(%)	p
Average age	74.7 (SD ±6.5)	77.0 (SD ±6.4)	71.1 (SD ±4.7)	0.052
Gender				
Female	38 (38)	13 (13)	25 (41.7)	
Male	62 (62)	27 (67.5)	35 (58.3)	0.355
Residence in Pichincha				
Yes	54 (54)	29 (72.5)	25 (41.5)	
No	46 (46)	11 (27.5)	35 (58.3)	0.002
≥ 2 Comorbidities				
Yes	41 (41)	13 (32.5)	28 (46.7)	
No	59 (59)	27 (67.5)	32 (53.3)	0.158
Secondary AML*				
Yes	23 (23)	6 (15.0)	17 (28.3)	
No	77 (77)	34 (85.0)	43 (71.7)	0.121
≥ 40.000 leukocytes/mm3				
yes	22 (22)	10 (28.3)	12 (12.0)	
No	78 (78)	30 (71.7)	48 (80.0)	0.554

***Only one patient had secondary AML due to chemotherapy for breast cancer**

Of the 40 patients who received intensive chemotherapy, 8 (20%) had induction-related deaths (1/11 [9%] received 7+3, and 7/29 [24.2%] received 5+2). In 6/8 (75%) of these cases, the deaths were due to sepsis, with bacteria isolated from blood cultures in 2 patients. Both cases were *Klebsiella pneumoniae* carbapenemase-producing (KPC). [2] (5%) patients died during consolidation therapy, resulting in a total treatment-related mortality of 25% in this cohort.

11 (100%) patients received reinduction chemotherapy, 6 patients (54.5%) achieved remission and 5 patients were considered primary refractory, the latter representing 12.5% of all AML who received intensive chemotherapy and who could be evaluated for CR in bone marrow. Adding the patients who achieved CR in first and second induction, there were a total of 15, which represents 37.5% of the cases.

Table 2. Logistic Regression Models for Premature Death After Diagnosis and Premature Death After Leukemia Therapy.

	Early death at 2 months after diagnosis			Early death at 2 months after treatment		
VARIABLE	**OR**	**IC 95%**	**p**	**OR**	**IC 95%**	**p**
Age	1.05	0.98-1.12	0.12	1.02	0.94-1.11	0.48
Gender						
Female	Reference			Reference		
Male	0.56	0.23-1.37	0.2	0.65	0.24-1.75	0.39
Residence in Pichincha						
Yes	Reference			Reference		
No	0.75	0.30-1.85	0.54	0.7	0.25-1.93	0.5
≥ 2 Comorbidities						
Yes	Reference			Reference		
No	1.12	0.45-2.76	0.79	1.32	0.47-3.74	0.59
Secondary AML*						
Yes	Reference			Reference		
No	0.55	0.19-1.62	0.28	0.53	0.17-1.63	0.27
≥ 40.000 leukocytes/mm3						
yes	Reference			Reference		
No	0.16	0.05-0.50	<0.01	0.2	0.06-0.65	<0.01

***AML = Acute Myeloid Leukemia.**

Patients Who Did Not Receive Intensive Chemotherapy

Of the 60 patients who did not receive intensive chemotherapy, 34 (56.6%) received low-dose ARA-C. 17 (28.3%) patients received only supportive care, and 9 (15%) patients were treated with mercaptopurine.

months vs. 1 month; p <0.01), but not for patients < 75 years old (5 months vs. 3 months; p = 0.360). Figures 1 and 2 show the overall survival curves for groups: chemotherapy type and leukocyte count at presentation, which were significant in univariable analysis. (See Table 3).

Table 3. Median survival and overall survival by subgroups, univariate analysis

Characteristic	n(%)	Median SG in months	SG at 1 year	SG at 2 years	p
Intensive chemotherapy	40	5 [95% CI: 3-15]	33% [95% CI: 21%-52%]	14%[95% CI: 6.1%-31%]	
Low dose ARA-C	34	3 [95% CI: 1-5]	2.9% [95% CI: 0.4%-20%]	2.9%[95% CI: 0.4%-20%]	
Support treatment only	17	1 [95% CI: 0-5]	0%	0%	
Induction chemotherapy					p=0.99
5+2	29(72.5)	5 [95% CI: 3-18]	35% [95% CI: 21%-59%]	12% [95% CI: 4.1%-34%]	
7+3	11(27.5)	5 [95% CI: 5-NA]	27% [95% CI: 10%-72%]	18%[95% CI: 5.2%-64%]	
AML de novo					p=<0.01
Intensive chemotherapy	34(60.7)	5 [95% CI: 3-16]	35%[95% CI: 22%-56%]	15%[95% CI: 4.1%-34%]	
Low dose ARA-C	22(39,3)	3 [95% CI: 1-6]	0%	0%	
Secondary AML					p=0.90
Intensive chemotherapy	6(26)	5 [95% CI: 2-NA]	0%	0%	
Low dose ARA-C	17(74)	3 [95% CI: 1-10]	12% [95% CI: 3.2%-43%]	5.9%[95% CI: 0.9%-39%]	
≥40,000 leukocytes/mm³					p=<0.01
No	78(78)	4 [95% CI: 3-6]	17%[95% CI: 10%-28%]	7.9%[95% CI: 3.7%-17%]	
Yes	22(22)	1 [95% CI: 0-3]	9,8%[95% CI: 2.7%-37%]	0%	
Residents of the province of Pichincha					p=0.79
No	46(46)	3 [95% CI: 2-6]	8.7% [95% CI: 3.4%-22%]	6.5% [95% CI: 2.2%-19%]	
Yes	54(54)	3 [95% CI: 1-5]	22% [95% CI: 13%-37%]	6% [95% CI: 2%-18%]	

Early Mortality at 2 Months

Early mortality within two months of diagnosis was observed in 45% of older patients with AML. In multivariable analysis, the only protective factor associated with early death after diagnosis was having ≤ 40,000 leukocytes/mm³ at presentation (OR 0.16 [95% CI, 0.05-0.50], p <0.01). (See Table 2).

Early mortality within two months of starting chemotherapy was observed in 49.9% of older patients with AML. In multivariable analysis, the only protective factor associated with early death after starting chemotherapy was having ≤ 40,000 leukocytes/mm³ at presentation (OR 0.20 [95% CI, 0.06-0.65], p <0.01). (See Table 2).

Overall Survival (OS)

The median survival for all patients was 3 months (95% CI, 2-5) (interquartile range 1-126), with 1- and 2-year OS rates of 16% (95% CI, 9.8%-25%) and 6.2% (95% CI, 2.9%-14%), respectively, at a median follow-up of 3 months. The median survival times were as follows: 5 months in the intensive chemotherapy group; 3 months in the low-dose ARA-C group; 1 month in the supportive care group; 3 months in the secondary AML group; 3 months in the de novo AML group (Table 3). There was an improvement in median survival for patients ≥ 75 years old who received either intensive or non-intensive chemotherapy (3

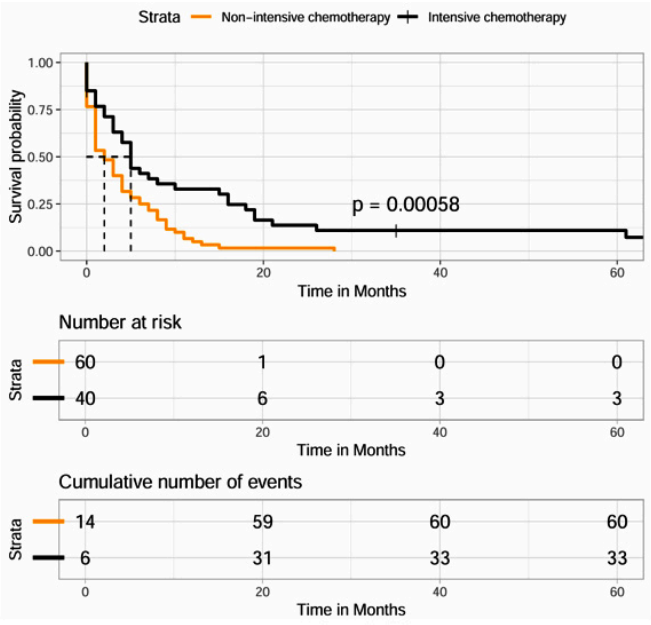

Figure 1. Kaplan-Meier curve, patients ≥ 65 years with Acute Myeloid Leukemia not treated with intensive chemotherapy vs. treatment with intensive chemotherapy, median survival of 3 months [95% CI: 1-4] and 5 months [95% CI: 3-15], respectively. (The dashed line represents the median survival achieved by stratum.)

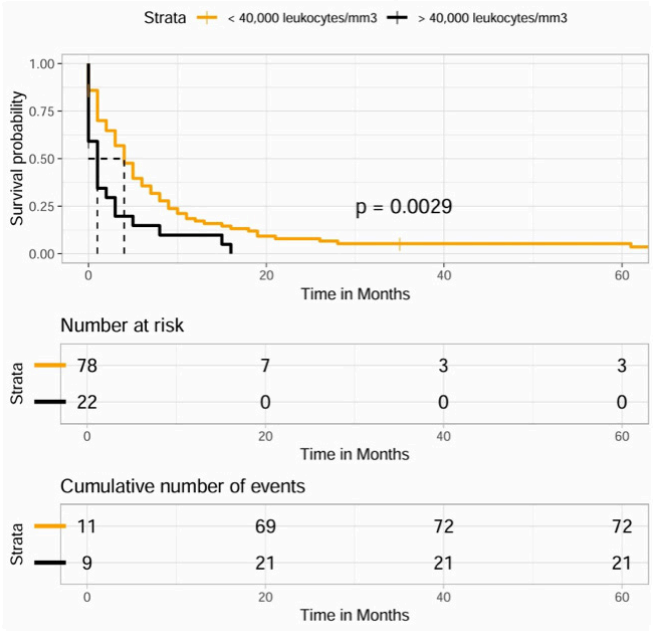

Figure 2. Kaplan-Meier Curve, patients ≥ 65 years with Acute Myeloid Leukemia who presented with or without ≥ 40,000 leukocytes/mm³ at diagnosis, median survival of 4 [95% CI: 3-6] and 1 [95% CI: 0-3] respectively. (The dashed line represents the median survival reached by stratum)

Variable		N	Log Hazard ratio	Hazard ratio (IC 95%)	p
Age		100		1.02 (0.98, 1.06)	0.4
Sex	Male	62		Reference	
	Female	38		0.79 (0.50, 1.25)	0.3
≥40,000 leukocytes/mm3	No	78		Reference	
	Yes	22		2.81 (1.60, 4.92)	<0.001
Intensive chemotherapy	No	60		Reference	
	Yes	40		0.35 (0.19, 0.63)	<0.001
Type of AML	De novo	77		Reference	
	Secondary	23		0.82 (0.44, 1.53)	0.5
Residents of the province of Pichincha	No	46		Reference	
	Yes	54		1.21 (0.74, 1.96)	0.4
≥ 2 Comorbidities	No	59		Reference	
	Yes	41		0.86 (0.54, 1.37)	0.5

Figure 3. Multivariate analysis for overall survival in older patients with non-M3 acute myeloid leukemia

DISCUSSION

The 59% and 66% of patients with AML in the US SEER registry and the Swedish registry, respectively, were ≥ 65 years, whereas in this study only 41.1% of patients belonged to this age group. This difference could be explained, firstly, by a different population pyramid in Ecuador compared to developed countries, which generally have a higher density of elderly populations (the percentage of the population ≥ 65 years old in Ecuador is 8.07% vs. 17.3% in the US) [7,8], and secondly, by the higher likelihood of underdiagnosis of older patients with AML, as they may not have access to specialized centers that treat oncological and hematological diseases, perhaps because they were too ill at the time of diagnosis.

The relative incidence of secondary AML increases with age. It has been reported that for older adults, secondary AML from those observed in our study, where 23% of patients had secondary AML from MDS and chemotherapy-related AML account for approximately 19% and 7% of AML cases, respectively [9,10]. These results are not far from those observed in our study, where 23% of patients had secondary AML from MDS. Regarding chemotherapy-related AML in this cohort, the rate is lower (only 1%), which could be explained by a lower overall survival rate in solid cancers in Ecuador (MDS generally occurs between 2 and 7 years after chemotherapy exposure), as well as possibly lower access to chemotherapy for solid tumors in Ecuador in general.

In the 2024 Mexican study by Jaime et al. [11], conducted in somewhat younger patients with AML ≥ 55 years, the median survival was 4.8 months, 1.6 months, and 1.1 months in the intensive chemotherapy, low-dose ARA-C, and supportive care groups, respectively, while in our cohort, similar median survival times were found: 5 months, 3 months, and 1 month in the same groups. Similarly, Mendoza-Urbano et al.[12] in 2022 in Colombia reported somewhat similar median survival times, with a median survival of 8 months in the chemotherapy group (which included not only the 7+3 and 5+2 intensive chemotherapy regimens but also patients who received hypomethylating agents) and 1 month in the supportive care group. The population in this Colombian study was somewhat older, including patients ≥ 60 years.

In the US in 2018, a median survival of 2.7 months and a 1-year OS rate of 21.8% were reported [1], whereas in our study, similar rates were found in all patients, with a median survival of 3 months and a 1-year OS rate of 16%.

In the last decade, new alternatives have been presented to try to improve the low survival rates with conventional chemotherapy in older patients with AML, rates that are influenced not only by poor response in general but also by chemotherapy toxicity. Therefore, more effective and less toxic drugs are the objectives to aim for in managing these patients.

In 2020, the FDA approved the first hypomethylating agent for AML. In a phase III multicenter clinical trial conducted by Dombret H et al. in the US, azacitidine (AZA) monotherapy was compared to conventional treatment regimens, including intensive chemotherapy, low-dose Ara C, or supportive care, in older patients with de novo AML and AML secondary to MDS. The AZA group had a higher OS of 10.4 months versus 6.5 months and better 1-year survival rates (46.5% vs. 34.2%) [13].

Lübbert M et al. published a phase III multicenter study in patients aged 60 or older comparing first-line treatment with decitabine monotherapy and intensive chemotherapy 7+3, finding no improvement in OS with decitabine, but it showed a better safety profile [14]. The Spanish retrospective registry PETHEMA, by Labrador et al., showed similar survival times to the randomized studies for azacitidine and decitabine, 10.4 months and 8.8 months, respectively [15].

Another innovative drug, Venetoclax in combination with hypomethylating agents, was also approved by the FDA in 2020 for the treatment of AML. In the VIALE-A trial, which compared azacitidine monotherapy and Venetoclax/Azacitidine (Ven/Aza), a survival difference was found between these two groups, with 14.7 months in the azacitidine-venetoclax group and 9.6 months in the azacitidine monotherapy group, with a 2-year OS rate of 37.5% vs. 16.9%, respectively [16,17]. On the other hand, Solana-Altabella et al. in 2024 conducted a systematic review, mostly with real-world retrospective studies, in which a lower median OS (10.3 months) was reported compared to the VIALE-A study [18].

In Latin America, there are few reports on the use of Ven/Aza. In a small retrospective study conducted in Peru and Mexico by Gomez-de Leon et al., in patients ineligible for first-line intensive chemotherapy, Venetoclax was initiated with a dose ramp-up, and the average maximum dose achieved was 200 mg, half the usual dose. It was found that patients receiving first-line treatment with Ven/Aza had a median OS of 9.6 months (95% CI 4.2-15)[19], which was somewhat higher than the median survival with intensive chemotherapy (5 months) and low-dose ARA-C (3 months). We conclude that Venetoclax-based therapy for AML was effective despite dose reductions, with results similar to those reported in other real-world studies but lower than those reported by the VIALE-A study.

Regarding the dose reduction, Philippe et al. and Aiba et al. mentioned that the duration of Venetoclax treatment has generally been reduced from 28 days to 21 or 14 days in routine practice to limit cytopenia and the risk of complications, while still maintaining a satisfactory CR rate [20,21]. The reduction in dose and treatment days could thus become an alternative in countries with limited healthcare resources, such as Ecuador, to improve accessibility in the context of the high costs of these innovative drugs, which far exceed the average annual family income in Ecuador (USD 10,304).

As noted above, there is significant variability in the survival rates of elderly patients with AML, variability that is not only present, as might be expected, between controlled clinical trials (which are difficult to reproduce in clinical practice) and real-world registries, but also between real-world studies conducted at different reference centers. For example, the multicenter real-world study by Miyamoto et al., conducted in Japan, Canada, Italy, Spain, Singapore, Korea, Argentina, Colombia, Australia, Taiwan, and Romania, which collected data from 1,327 patients, showed a median overall survival of 7.8 months and a 1-year survival rate of 37% in the low-dose cytarabine group. These survival results were remarkably high, even surpassing the intensive chemotherapy group in this cohort, which had a median survival of 5 months and a 1-year survival rate of 18%. The difference is even more pronounced when compared with the 1-year survival rate in the low-dose cytarabine group, which was only 2.8% [22].

These contrasts in survival rates across different parts of the world highlight that survival in elderly AML patients is significantly influenced by other factors:

1) The healthcare system that provides patient care and the support it can offer;
2) Genetic status is an unknown factor, and it could possibly be related to a spectrum of adverse genetic risk in a higher percentage of Latinos;
3) High rates of multidrug-resistant bacteria that result in high treatment-related mortality, as shown by the intensive chemotherapy group in this cohort, which had an unacceptably high treatment-related mortality rate (25%).

These factors will explain the lower survival rates in this cohort, given the limitations in providing better patient support within the context of a saturated healthcare system with infrastructure not adequately adapted to care for oncological patients with high rates of multidrug-resistant bacteria.

Additionally, this adverse reality of the country's public healthcare system could dilute the potential benefit of innovative drugs such as Venetoclax, which, in general, have not yet dramatically improved survival rates in elderly AML patients worldwide. These drugs require good support and accompaniment from the healthcare system that provides services to patients.

Finally, physical status, comorbidities, and frailty indices are more important indicators of functional status than age itself. Age alone should not be the main determinant of treatment [23]. In the context of the lack of availability of less toxic, innovative drugs, intensive chemotherapy in this patient group will be the best alternative for disease control, given that the main cause of death in AML is the lack of efficacy of treatments rather than chemotherapy-associated death. Therefore, Comprehensive Geriatric Assessment [24] should be mandatory to identify that group of elderly AML patients where "more is less.". Currently, in our center, the routine use of these tools to assess frailty before deciding the type of treatment for elderly AML patients has not been implemented, meaning that we may be missing patients who are candidates for intensive chemotherapy.

In conclusion, these data reflect the harsh reality faced by patients and doctors dealing with this disease in both young and elderly adults. While it would be important to gain access to new drugs for patients in the country, it is far more important for health administrators to initiate a crusade to improve the healthcare system that serves oncological patients, including: greater investment in infrastructure improvements, broader and more specialized teams of healthcare professionals in hematology and related fields such as infectious diseases, critical care, geriatrics, etc., working on improving access to transplants and cellular therapies for elderly patients, and more efficient management in public procurement systems for the acquisition of necessary resources to resolve the chronic shortages of supplies, medical devices, and medications.

CONCLUSIONS

The poor outcomes in these patients are lower than those reported in other real-world studies with conventional treatments. In our setting, improving survival in elderly AML patients could be related to improvements in patient support and care.

ABBREVIATIONS

AML Acute Myeloid Leukemia

CR Complete response

OS Overall survival

SEER Surveillance Epidemiology, and End Results

Ven/Aza Venetoclax/Azacitidine

AUTHORS' CONTRIBUTION

OA. ML: Research conceptualization and design.

OA, PV, AL: Analysis and data interpretation.

AO, AL, PV: Manuscript writing.

AO, PV, AL: Critical review of the Manuscript.

OA, ML: Data collection.

All of the Authors read and approved the final version of the article.

AVAILABILITY OF DATA AND MATERIALS

Free and limited bibliographic resources were used. The information collected is available upon request to the main author.

ETHICS COMMITTEE APPROVAL AND CONSENT TO PARTICIPATE IN THE STUDY.

The scientific article was approved by peers and by the Human Research Ethics Committee – CEISH/HECAM.

CONSENT FOR PUBLICATION

The publication was approved by the HECAM Editorial Policies Committee (EPC) on January 22, 2025, registered on Act No. 001.

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CONFLICTS OF INTEREST

The authors reported not having any personal, financial, intellectual, economic or corporate conflicts of interest.

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