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POSTER ABSTRACTS

613.ACUTE MYELOID LEUKEMIAS: CLINICAL AND EPIDEMIOLOGICAL

Impact of Residence in an Agricultural Zone on AML Characteristics

Vincent Marmouset, MD[1], *Berengere Gruson, MD*[2], *Veronique Harrivel, MD*[3], *Céline Berthon, MD*[4], *Nicolas Duployez, MD*[5], *Claude Preudhomme, PharmD, PhD*[6], *Jean Pierre Marolleau, MD PhD*[7], *Pierre Morel, MD*[7], *Carine Hauspie, MD*[5], *Stéphane Morisset, Biostat*[8], *Delphine Lebon*[9]

[1] Hematology Department, Centre hospitalier universitaire d'Amiens, Amiens, France
[2] Clinique de l'Europe, Amiens, FRA
[3] Hematology Laboratory, Centre hospitalier universitaire d'Amiens, Amiens, FRA
[4] Hematology Department, CHRU Lille, Lille, France
[5] Hematology Laboratory, CHRU Lille, Lille, France
[6] Hematology Laboratory, CHU Lille, Lille, France
[7] Service d'Hématologie Clinique, Centre Hospitalier Universitaire Amiens-Picardie, Amiens, France
[8] Centre Léon Bérard, Lyon, France
[9] Hematology Department, CHU Amiens, Amiens, France

Background: Acute Myeloid Leukemia (AML) is associated with several well-established risk factors. These include cigarette smoking, exposure to benzene, to ionizing radiation, and previous exposure to chemotherapy. Interestingly, studies have observed higher incidence rates of AML in farming regions, suggesting that farming activities and related exposures, such as pesticides, may increase the risk. However, data regarding the potential variations in clinical, cytogenetic, and molecular profiles between individuals living in rural and urban areas are lacking. Therefore, we aim to specifically examine the characteristics and the outcomes of AML patients living in agricultural areas.
Patients and methods: We performed a retrospective analysis including 315 patients newly diagnosed with AML from two French institutions, namely Amiens University Hospital and Lille University Hospital, from 2008 to 2013. We collected patient demographics, along with comprehensive data encompassing clinical and biological information, including cytogenetics and molecular data. The data was obtained from the Observatoire des Hauts-de-France, enabling a comprehensive and exhaustive review of the AML cases in this specific region. We geocoded the patients' residential addresses. This process involved linking the patient's location to the corresponding agricultural areas per municipality, by using geographical information from the French Ministry of Agriculture's statistics department (AGRESTE, https://www.agreste.agriculture.gouv.fr). This enabled us to establish a connection between the patients' locations and the specific agricultural regions they resided in. We categorized the population into terciles based on the proportion of local companies engaged in farming activities.
Results: Approximately one-third (n=108) of patients were living in areas with less than 1.3% of farm companies, one-third (n=102) lived in regions with a percentage ranging from 1.3% to 6.9%, while the remaining third (n=105) lived in areas where the proportion of farm companies exceeded 6.9%. Sex ratio (p=0.7) and median age at diagnosis (60 vs 60.5 vs 58 years, p=0.5) were similar between the 3 groups. There was no difference in body mass index (BMI), smoking activity, alcohol consumption and performance status score between the three groups.
At baseline, there was no difference in blood counts (hemoglobin, platelets, leukocytes, and circulating blasts levels), bone marrow blasts percentage, AML type (de novo vs. post MDS or MPN), or WHO classification between the 3 groups. Regarding cytogenetic abnormalities, people living on agricultural lands had fewer normal karyotypes (27% vs 33% and 43%, p=0.045) and more MLL rearrangement (20% vs 8% and 5%, p=0.013). However, there was no difference in the SWOG and ELN 2017 classifications. Regarding molecular characteristics, *NPM1* mutations were found less frequently in people living in agricultural regions (13% vs 30% and 29%, p=0.021). There was no difference for *FLT3*-ITD positivity and *CEBPA* mutation.
There was no difference in complete remission rate and hematopoietic stem cell transplantation treatment though we could underline an especially low rate of HSCT in the < 1.3% group. OS was also similar between the three groups (Table 1.).
Conclusions: Our study showed a correlation between living in agricultural areas and a higher prevalence of unfavorable cytogenetic and molecular features in AML patients, although clinical outcomes remain unchanged. These findings suggest that

the proximity to agricultural activities could have an impact on leukemogenesis, by increasing the rate of MLL rearrangements and chromosomic abnormalities.

Disclosures No relevant conflicts of interest to declare.

Table 1. Characteristics of AML according to the proportion of farm in the areas

	Proportion of farm			p-value
	≤ 1.3 (n=108)	>1.3 & ≤ 6.9% (n=102)	> 6.9% (n=105)	
Age, median (range)	60 (18 ; 91)	60.5 (17 ; 85)	58 (19 ; 87)	0.523**
Sex ratio (M/F)	1.16	1.26	1.44	0.732*
Cigarette smoking, No (%)	21/96 (21.88%)	13/86 (15.12%)	18/80 (22.50%)	0.352*
BMI, median (range)	24.69 (14.98 ; 49.02)	26.11 (17.36 ; 305.78)	25.63 (15.62 ; 48.33)	0.780**
Type of AML, secondary (%)	26 (25.5)	13 (13.4)	21 (20.79)	0.191*
White blood cells, 10^9/L, median (range)	6.83 (0.4 ; 319)	6.32 (0.64 ; 311.56)	5.89 (0.5 ; 325)	0.859**
Performance status, No (%)				0.275*
0	31/94 (32.98%)	39/90 (43.33%)	38/83 (45.78%)	
1	51/94 (54.26%)	36/90 (40.00%)	36/83 (43.37%)	
2	8/94 (8.51%)	6/90 (6.67%)	6/83 (7.23%)	
3	3/94 (3.19%)	7/90 (7.78%)	1/83 (1.20%)	
4	1/94 (1.06%)	2/90 (2.22%)	2/83 (2.41%)	
Normal karyotype, No (%)	46/108 (42.59%)	33/102 (32.35%)	28/105 (26.67%)	0.045*
MLL rearrangement, No (%)	3/63 (4.76%)	5/60 (8.33%)	14/70 (20.00%)	0.013*
FLT3-TKD mutation, No (%)	4/92 (4.35%)	6/89 (6.74%)	2/81 (2.47%)	0.433*
FLT3-ITD mutation, No (%)	14/93 (15.05%)	16/88 (18.18%)	9/82 (10.98%)	0.417*
NPM1 mutation, No (%)	24/84 (28.57%)	25/83 (30.12%)	10/77 (12.99%)	0.021*
CEBPA mutation, No (%)	7/82 (8.54%)	2/81 (2.47%)	7/71 (9.86%)	0.143*
Complete remission, No (%)	75/108 (69.44%)	71/102 (69.61%)	71/105 (67.62%)	0.942*
HSCT, No (%)	15/108 (13.89%)	23/102 (22.55%)	24/105 (22.86%)	0.174*
OS, months [95% CI]	32.99 [18.76-81.84]	50.37 [24.31-NA]	100.21 [32.85-NA]	0.138***

Abbreviations: AML: acute myeloid leukemia, BMI: body mass index, HSCT: hematopoietic stem cell transplantation.
* Pearson's Chi-square ** Kruskal-Wallis test *** Log-rank test

Figure 1

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