





Blood 142 (2023) 5384-5386

The 65th ASH Annual Meeting Abstracts

ONLINE PUBLICATION ONLY

203.LYMPHOCYTES AND ACQUIRED OR CONGENITAL IMMUNODEFICIENCY DISORDERS

Risk Factors for Severe Infection and Unfavorable Outcomes in Hematologic Malignancy Patients with COVID-19 Inflection during the Omicron Era: A Chinese Single-Center Retrospective Study

Li Ye 1,2,3,4 , Ye Yang 2,1,3,4 , Xuewu Zhang 2,1,4,3 , Lu Wang 1,3,4,2 , Li Zhu 2,1,3,4 , Xia Li 2,1,3,4 , Yile Zhou 5,6,7,4 , Xiaolong Zheng 8,1,3,4 , Xinping Zhou 1,3,2,4 , Yanling Ren, MD 7,7,5,4 , Liya Ma 6,7,5,4 , Gaixiang Xu 5,9,10,4 , Chunmei Yang 6,5,7,4 , Huafeng Wang 6,5,11,12 , De Zhou 9,4,10,5 , Min Yang 2,1,3,4 , Xingnong Ye, MD 6,7,5,4 , Juying Wei 6,5,4,7 , Wen-Juan Yu 6,5,12,13 , Jiejing Qian, MD 5,6,4,7 , Yinjun Lou, MD^{6,4,5,7}, Wanzhuo Xie^{7,6,5,4}, Jian Huang^{6,4,5,7}, Haitao Meng^{7,6,5,12}, Jie Jin ^{10,14,11,4}, Hongyan Tong, PhD ^{11,10,12,14}

- ¹Zhejiang Provincial Key Lab of Hematopoietic Malignancy, Zhejiang University, Hangzhou, China
- ²Department of Hematology, the First Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China
- ³Zhejiang Provincial Clinical Research Center for Hematological disorders, Hangzhou, China
- ⁴Zhejiang University Cancer Center, Hangzhou, China
- ⁵Zhejiang Provincial Clinical Research Center for Hematological disorders, Hangzhou, China;, Hangzhou, China
- ⁶Zhejiang Provincial Key Lab of Hematopoietic Malignancy, Zhejiang University, Hangzhou, Zhejiang, PR China;, Hangzhou, China
- ⁷ Department of Hematology, the First Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, PR China;, Hangzhou, China
- ⁸ First Affiliated Hospital, School of Medicine, Zhejiang University, Hangzhou, China
- ⁹ Department of Hematology, the First Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, Zhejiang, Hangzhou, China
- ¹⁰Zhejiang Provincial Key Lab of Hematopoietic Malignancy, Zhejiang University, Hangzhou, Zhejiang, Hangzhou, China
- ¹¹The First Affiliated Hospital of Zhejiang University School of Medicine, Hangzhou, China
- ¹²Zhejiang University Cancer Center, Hangzhou, China
- ¹³The First Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China
- ¹⁴Zhejjang Provincial Clinical Research Center for Hematological disorders, Hangzhou, Zhejjang, Hangzhou, China

Purpose: The objective of this study was to evaluate the potential risk factors associated with severe infection and unfavorable outcomes among individuals with hematologic malignancies who contracted the coronavirus infectious disease (COVID-19) during the Omicron era.

Methods: This retrospective analysis included adult patients with hematologic malignancies who were diagnosed with COVID-19 during the period from November 2022 to February 2023. A comparison was made between the clinical characteristics of patients who experienced persistent COVID-19 infection or succumbed to death within 30 days and those of the remaining patients.

Results: A total of 134 patients were included in the analysis, with 23.9% (n=32) presenting as asymptomatic/mild and 29.1% (n=39) classified as severe cases. Among the patients, 54.4% (n=73) had received at least two doses of vaccines. In the subgroup of asymptomatic/mild patients, 50% had received at least three doses of vaccines, while among the severe patients, 56.4% remained unvaccinated. The multivariate analysis examining risk factors for severe infection in COVID-19 and hematologic malignancy patients identified the number of vaccine doses as an independent prognostic factor. Less than two doses of vaccines were found to be associated with severe COVID-19 infection (odds ratio [OR]: 4.213, 95% confidence interval [CI] 1.433-12.392; p=0.009). In this study, patients with persistent COVID-19 infection or succumbed to death within 30 days were categorized as the unfavorable group (n=57), while the remaining patients were classified as the favorable group (n=77). A significant difference was observed between the two groups in terms of median age (p=0.015), malignancy status (p=0.001), number of vaccine doses received (p=0.001), neutrophil count (p=0.011), immunoglobulin G levels (p=0.038), and interleukin-6 levels (p=0.025). In the multivariable analysis of risk factors for unfavorable outcomes in patients with both COVID-19 and hematologic malignancies, it was found that the number of vaccine doses and the level of immunoglobulin G were independent prognostic factors. Specifically, receiving less than two doses of vaccines (OR: 233, 95%CI 0.068-0.798; p=0.020) **ONLINE PUBLICATION ONLY** Session 203

and having an immunoglobulin G level below 1000 (OR: 220, 95%CI 0.066-0.753; p=0.014) were associated with unfavorable outcomes.

Conclusions: Receiving multiple doses of vaccines and having higher levels of immunoglobulin G were found to improve the clinical outcome of COVID-19 in patients with hematologic malignancies.

Disclosures No relevant conflicts of interest to declare.

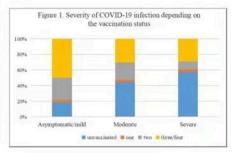
https://doi.org/10.1182/blood-2023-184470

₹
0
ad
ed
#
ď
⇉
₫
Ď.
/as
š
힏
₫
S
Ħ
ŭ
1S.n
et
6
blood
an
흕
φ
ġ
₹
142/S
12/8
용
ē
lemen
ent
1/5384
538
4/
21
~
5298
8
ĕ
blood
4
19
1985
⇉
<u>a</u>
₽
þ
ý
gues
es
č
9
\rightarrow
18 Ma
<u>a</u>
Υ,
8 May 2024
24

Median age at time of diagnosis, (IQR: years) 61(\$2.68) Female sex 58(43.5%) Median BMI (IQR) 22.5(20.4-24.7) Hematologic malignancy 28(20.9%) MDSMPN 16(11.9%) Acute Lymphodia leukemia 7(5.2%) B cell Lymphoma 60(44.8%) T cell Lymphoma 9(6.7%) Plasma cell disorders 10(7.5%) Others (Castleman disease, NK lymphoma, Hodgkin's disease, Epstein-virus-associated lymphoproliferative disorders) Malignancy status at COVID-19 diagnosis 25(18.7%) Active malignancy 25(18.7%) Active malignancy 25(18.7%) Active malignancy 28(20.9%) Onset 35(26.1%) Time from last treatment to COVID-19 diagnosis 10(2.2.4%) In the last month 59(44.3%) In the last 3 months > 3 months 10(2.2.4%) In the last 3 months > 3 months 59(4.3.5%) Number of varceines dose 10(2.2.4%) Unvaccinated 56(4.1.8%) One dose 5(3.7%) Three four doses 27(20.1%) Three four doses 27(20.1%) Three four doses 27(20.1%) Three four doses 3(3.7%) Two doses 3(3.7%) Three four doses 3(3.7%) Three four doses 3(3.7%) Severity of CVID-19 infection 4(3.4.5%) Asymptomatic mild 32(23.9%) Moderate 39(29.1%)		N(%)
Female sex \$18(43.3%)	Total number of patiets	134(100%)
Female sex \$18(43.3%)	Median age at time of diagnosis, (IQR: years)	61(52-68)
Hematologic malignancy	Female sex	58(43.3%)
Acute Invalcid leukemia 28(20.9%)	Median BMI (IQR)	22.5(20.4-24.7)
MDSMPN	Hematologic malignancy	Facilities and the
MDSMPN	Acute myeloid leukemia	28(20.9%)
B call lymphoma	MD8/MPN	16(11.9%)
B csll ymphoma	Acute Lymphoid leukemia	7(5.2%)
Teal		60(44.8%)
Others (Castleman disease, NK lymphoma, Hodgkin's disease, Epstein- virus-associated lymphoproliferative disorders) Malignancy status at COVID-19 diagnosis Controlled malignancy 46(34.3%) Stable malignancy 25(18.7%) Active malignancy 28(20.9%) Onset 35(26.1%) Time from last treatment to COVID-19 diagnosis Untreated 30(22.4%) In the last month 59(44.3%) In the last month 59(44.3%) In the last month 59(44.3%) Number of vaccines dose Unvaccinated 56(41.8%) No doses 5(3.7%) Two doses 46(34.3%) Severity of COVID-19 infection Asymptomatic mild 32(23.9%) Moderate 63(47.0%) Severe 39(29.1%) Comorbidities before COVID-19 No comorbidities before COVID-19 No comorbidities 56(44.8%) 1 Comorbidities 51(23.3%) 2 Comorbidities 51(23.3%) 3 or more comorbidities 51(23.3%) Cardiac disease 3(2.2%) Pulmanony disease 12(16.4%) Neutrophil count (IQR; ×10%L) Lymphocyte count (IQR; ×10%L) Covirciosate of several manusoglobulin ±1AK inhibitor Antivirus ± corticosteroids ± Immunoglobulin ±1AK inhibitor 47(35.1%)		9(6.7%)
virus-associated lymphoproclifer ative disorders) Malignancy status at COVID-19 diagnosis Controlled malignancy \$120(29%) Stable malignancy \$25(18.7%) Active malignancy \$25(20.9%) Onset \$35(26.1%) Time from last treatment to COVID-19 diagnosis Untreated \$30(22.4%) In the last month \$59(44.3%) In the last 3 months / > 3 months Number of varceines dose Unvaccinated \$56(41.8%) One dose \$15(3.7%) Two doses \$27(20.1%) Three four doses \$27(20.1%) Three four doses \$27(20.1%) Three four doses \$27(20.1%) Severity of COVID-19 infection Asymptomatic/mild \$3(23.9%) Moderate \$3(47.0%) Severe \$39(29.1%) Comorbidities before COVID-19 No comorbidities before COVID-19 No comorbidities \$0(44.8%) \$1 Comorbidities \$0(44.8%) \$2 Comorbidities \$1 (20.0%) Tomorbidities \$1 (20.0%) Tomorbidities \$2 (20.0%) Pulmanory disease \$3(2.2%) Pulmanory disease \$3(2.2%) Chronic kidney disease \$3(2.2%) Chronic kidney disease \$3(2.2%) Chronic liver disease \$3(2.2%) Neutrophil count (QR; ×10°L) Lymphocyte count (QR; ×10°L) Antivirus ± corticosteroids ± Immunoglobulin ±JAK inhibitor Artivirus ± corticosteroids ± Immunoglobulin ±JAK inhibitor Artivirus ± corticosteroids ± Immunoglobulin ±JAK inhibitor 47(35.1%)	Plasma cell disorders	10(7.5%)
virus-associated lymphoproclifer ative disorders) Malignancy status at COVID-19 diagnosis Controlled malignancy \$120(29%) Stable malignancy \$25(18.7%) Active malignancy \$25(20.9%) Onset \$35(26.1%) Time from last treatment to COVID-19 diagnosis Untreated \$30(22.4%) In the last month \$59(44.3%) In the last 3 months / > 3 months Number of varceines dose Unvaccinated \$56(41.8%) One dose \$15(3.7%) Two doses \$27(20.1%) Three four doses \$27(20.1%) Three four doses \$27(20.1%) Three four doses \$27(20.1%) Severity of COVID-19 infection Asymptomatic/mild \$3(23.9%) Moderate \$3(47.0%) Severe \$39(29.1%) Comorbidities before COVID-19 No comorbidities before COVID-19 No comorbidities \$0(44.8%) \$1 Comorbidities \$0(44.8%) \$2 Comorbidities \$1 (20.0%) Tomorbidities \$1 (20.0%) Tomorbidities \$2 (20.0%) Pulmanory disease \$3(2.2%) Pulmanory disease \$3(2.2%) Chronic kidney disease \$3(2.2%) Chronic kidney disease \$3(2.2%) Chronic liver disease \$3(2.2%) Neutrophil count (QR; ×10°L) Lymphocyte count (QR; ×10°L) Antivirus ± corticosteroids ± Immunoglobulin ±JAK inhibitor Artivirus ± corticosteroids ± Immunoglobulin ±JAK inhibitor Artivirus ± corticosteroids ± Immunoglobulin ±JAK inhibitor 47(35.1%)	Others (Castleman disease, NK, lymphoma, Hodgkin's disease, Epstein-	Barr 4(3.0%)
Malignancy at no. at COVID-19 diagnosis		
Controlled malignancy 46(34 3%) Stable malignancy 25(18.7%) Active malignancy 28(20.9%) Onset 35(26.1%) Time from last treatment to COVID-19 diagnosis Untreated 30(22.4%) In the last month 59(44.3%) In the last month 45(33.6%) Number of vaccinated 56(41.8%) One dose 5(3.7%) Two doses 27(20.1%) Three four doses 46(34.3%) Severity of COVID-19 infection Asymptomatic mild 32(23.9%) Moderate 36(47.0%) Severe 39(29.1%) Comorbidities before COVID-19 No comorbidities 60(44.8%) Severe 39(29.1%) Comorbidities 4(3.0%) Comorbidities 4(3.0%) Comorbidities 4(3.0%) Comorbidities 4(3.0%) Comorbidities 4(3.0%) Cardiac disease 3(2.2%) Pulmanony disease 21(16.4%) Chronic kidney disease 4(3.0%) Chronic kidney dise		
Stable malignancy		46(34.3%)
Active malignancy Onset Section Section		
Onset 35(26.1%)		
Time from last treatment to COVID-19 diagnosis Untreated 30(22.4%) In the last 3 months /> 3 months In the last 3 months /> 3 months Value of the last 3 months /> 3 months Value of the last 3 months /> 3 months Value of the last 3 months /> 3 months /> 3 months Value of the last 3 months /> 3 months /> 3 months Value of the last 3 months /> 3 months /> 3 (41.8%) Unvaccinated 56(41.8%) One dose 5(3.7%) Two doses 27(20.1%) Three/four doses Severity of COVID-19 infection Asymptomatic mild 32(23.9%) Moderate 53(27.0%) Severe 93(29.1%) No comorbidities before COVID-19 No comorbidities before COVID-19 No comorbidities 10 (44.8%) 1 Comorbidities 1 (30.%) 2 Comorbidities 3 (23.1%) 3 or more comorbidities 4 (3.0%) Cardiac disease 3 (2.2%) Pulmanory disease 2 (16.4%) Chronic liver disease 4 (3.0%) Chronic liver disease 4 (3.0%) Chronic liver disease 4 (3.0%) Nypertension 1 (7(1.7%) Obesity Neutrophil count ((QR; ×10/L) Lymphocyte count ((QR; ×10/L) Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)		
Untreated 30(22.4%) In the last month 59(44.3%) In the last month 59(44.3%) In the last 3 months 56(41.8%) In the last 3 months 56(41.8%) In the last 3 months 56(41.8%) In the last months 59(29.1%) In the last months 59(29.1%		-5(20.270)
In the last month 59(44.3%) In the last 3 months 7.5 months 45(33.5%) Number of varaccines dose 1 Unvaccinated 55(41.8%) Unvaccinated 56(41.8%) Unvaccinated 46(34.5%) Unvaccinated 46(3.5%) Unva		30(22.4%)
In the last 3 months		
Number of vaccines dose 56(41.8%) Unvaccinated 56(41.8%) One dose 5(3.7%) Two doses 27(20.1%) Three/four doses 46(34.3%) Severity of COVID-19 infection 32(23.9%) Asymptomatic mild 32(23.9%) Moderate 63(47.0%) Severe 39(29.1%) Comorbidities before COVID-19 No comorbidities No comorbidities 60(44.8%) 1 Comorbidity 37(27.5%) 2 Comorbidities 31(23.1%) 3 or more comorbidities 4(3.0%) Cardiac disease 3(2.2%) Pulmanory disease 22(16.4%) Chronic kidney disease 22(16.4%) Chronic kidney disease 4(3.0%) Chronic kidney disease 4(3.0%) Chronic kidney disease 12(2.2%) Chronic kidney disease 12(2.2%) Chronic kidney disease 12(2.7%) Obsetts 17(12.7%) Obestty 13(9.7%) Neutrophil count (IQR; ×10%L) 2.5(1.1.4.1)		
Unvaccinated 55(41.8%) One dose 5(3.7%) Two doses 27(20.1%) Three/four doses 4(3.4.5%) Severity of CVID-19 infection Asymptomatic mild 32(2.3.9%) Moderate 63(47.0%) Severe 93(29.1%) Comorbidities before COVID-19 No comorbidities before COVID-19 No comorbidities 1 5(0.4.8%) 1 Comorbidities 9 (5(4.8.8%) 2 Comorbidities 9 (5(4.8.8%) Cardiac disease 9 (2.2.6.8%) Chronic kidney disease 9 (2.2.8%) Chronic kidney disease 17(2.2.7%) Chronic kidney disease		45(33.6%)
One dose 5(3.7%) Two doses 27(20.1%) Three four doses 4(34.5%) Severity of COVID-19 infection 32(23.9%) Moderate 63(47.0%) Severe 39(29.1%) Comorbidities before COVID-19 60(44.8%) No comorbidities 60(44.8%) 1 Comorbidity 37(27.6%) 2 Comorbidities 31(23.1%) 3 or more comorbidities 4(3.0%) Cardiac disease 3(2.2%) Pulmanory disease 22(16.4%) Chronic kidney disease 22(16.4%) Chronic kidney disease 4(3.0%) Chronic kidney disease 4(3.0%) Chronic kidney disease 4(3.0%) Obsoity 13(9.7%) Neutrophil count (IQR;×10°L) 2.5(1.1.41) Lymphocyte count (IQR;×10°L) 2.5(1.1.41) Lymphocyte count (IQR;×10°L) 0.6(0.4.1.1) COVID-19 treatment Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 56(41.8%) Corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)		
Two doses 27(20.1%) Three four doses 46(34.5%) Severity of COVID-19 infection Asymptomatic/mild 32(23.9%) Moderate 53(47.0%) Severe 39(29.1%) Comorbidities 64(7.0%) No comorbidities before COVID-19 No comorbidities 51(23.1%) 1 Comorbidities 51(23.1%) 2 Comorbidities 51(23.1%) 3 or more comorbidities 51(23.1%) 3 or more comorbidities 4(3.0%) Cardiac disease 3(2.2%) Pulmanory disease 22(16.4%) Chronic kidney disease 3(2.2%) Chronic kidney disease 4(3.0%) hypertension 27(20.1%) Diabetes 17(12.7%) Obesity 13(9.7%) Neutrophil count (IQR; ×10°L) 2.5(1.1.41) Lymphocyte count (IQR; ×10°L) 2.5(1.1.41) Lymphocyte count (IQR; ×10°L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)		
Three/four doses		
Severity of COVID-19 infection		
Asymptomatic mild 32(23 9%) Moderate 63(47 0%) Severe 39(29 1%) Comorbidities before COVID-19 No comorbidities 5 (60(44.8%) 1 Comorbidities 3 (60(44.8%) 2 Comorbidities 3 (32.3%) 3 or more comorbidities 4(3.0%) 3 or more comorbidities 4(3.0%) Cardiac disease 3(2.2%) Pulmanory disease 2(16.4%) Chronic kidney disease 3(2.2%) Chronic kidney disease 4(3.0%) hypertension 27(20.1%) Diabetes 07(20.1%) Diabetes 17(12.7%) Obesity 13(9.7%) Neutrophil count (IQR; ×10%L) 2.5(1.1.41) Lymphocyte count (IQR; ×10%L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)		46(34.3%)
Moderate 63 (47 0%) Severe 39(29.1%) Comorbidities 60(44.8%) 1 Comorbidities 60(44.8%) 2 Comorbidities 31(23.1%) 3 or more comorbidities 4(3.0%) 2 cradiac disease 3(2.2%) Pulmanory disease 22(16.4%) Chronic kidney disease 3(2.2%) Chronic kidney disease 4(3.0%) Chronic kidney disease 4(3.0%) Chronic kidney disease 4(3.0%) Obsoity 17(12.7%) Obesity 13(9.7%) Neutrophil count (IQR;×10 °L) 2.5(1.1.41) Lymphocyte count (IQR;×10 °L) 2.5(1.1.41) Lymphocyte count (IQR;×10 °L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 56(41.8%) Corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)		
Severe 39(29.1%)		
Comorbidities before COVID-19 No comorbidities 60(44.8%) 1 Comorbidity 37(27.6%) 2 Comorbidity 37(27.6%) 3 (23.1%) 3 or more comorbidities 4(3.0%) Cardiac disease 4(3.0%) Cardiac disease 3(2.2%) Pulmanory disease 2(16.4%) Chronic liver disease 4(3.0%) Chronic liver disease 4(3.0%) Chronic liver disease 4(3.0%) Chronic pulmanory disease 1(3.0%) Column disease 1(3.0%) Co	Moderate	63(47.0%)
No comorbidities 60(44.8%) 1 Comorbidities 37(27.6%) 2 Comorbidities 31(23.1%) 2 Comorbidities 31(23.1%) 3 or more comorbidities 44(3.0%) Cardiac disease 3(2.2%) Pulmanory disease 22(16.4%) Chronic kidney disease 3(2.2%) Chronic kidney disease 4(3.0%) Chronic kidney disease 4(3.0%) hypertension 27(20.1%) Diabetes 17(12.7%) Diabetes 17(12.7%) Neutrophil count (IQR;×10°L) 2.5(1.1.4.1) Lymphocyte count (IQR;×10°L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)	Severe	39(29.1%)
1 Comorbidity 37(27.6%) 2 Comorbidities 31(23.1%) 3 or more comorbidities 4(5.0%) 3 cradiac disease 4(5.0%) Cardiac disease 3(2.2%) Pulmanory disease 22(16.4%) Chronic kidney disease 3(2.2%) Chronic kidney disease 4(3.0%) hypertension 27(20.1%) Diabetes 17(12.7%) Obesity 13(9.7%) Neutrophil count (IQR; ×10°L) 2.5(1.1.41) Lymphocyte count (IQR; ×10°L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)	Comorbidities before COVID-19	
2 Comorbidities 31(23.1%) 3 or more comorbidities 4(5.0%) Cardiac disease 3(2.2%) Pulmanory disease 22(16.4%) Chronic kidney disease 3(2.2%) Chronic liver disease 4(3.0%) hypertension 27(20.1%) Diabetes 17(12.7%) Obesity 13(9.7%) Neutrophil count (IQR; × 10"L) 2.5(1.1.4.1) Lymphocyte count (IQR; × 10"L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)	No comorbidities	60(44.8%)
3 or more comorbidities 4(3.0%) Cardiac disease 3(2.2%) Pulmanony disease 22(16.4%) Chronic kidney disease 3(2.2%) Chronic kidney disease 4(3.0%) Chronic kidney disease 4(3.0%) hypertension 27(20.1%) Diabetes 17(12.7%) Diabetes 17(12.7%) Obesity 13(9.7%) Neutrophil count (IQR; × 10 1/L) 2.5(1.1.4.1) Lymphocyte count (IQR; × 10 1/L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)	1 Comorbidity	37(27.6%)
Cardiac disease 3(2.2%) Pulmanory disease 22(16.4%) Chronic kidney disease 3(2.2%) Chronic liver disease 4(3.0%) hypertension 27(20.1%) Diabetes 17(12.7%) Obesity 13(9.7%) Neutrophil count (IQR; ×10°L) 2.5(1.1-4.1) Lymphocyte count (IQR; ×10°L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticots crids ± Immunoglobulin ±JAK inhibitor 56(41.8%) Corticots recoids ± Immunoglobulin ±JAK inhibitor 47(35.1%)	2 Comorbidities	31(23.1%)
Pulmanory disease 22(16.4%)	3 or more comorbidities	4(3.0%)
Chronic kidney disease 3(2.2%)	Cardiac disease	3(2.2%)
Chronic liver disease 4(3.0%) hypertension 27(20.1%) Diabetes 17(12.7%) Obesity 13(9.7%) Neutrophil count (IQR;×10°L) 2.5(1.1-4.1) Lymphocyte count (IQR;×10°L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticotercids ± Immunoglobulin ±JAK inhibitor 56(41.8%) Corticots recoids ± Immunoglobulin ±JAK inhibitor 47(35.1%)	Pulmanory disease	22(16.4%)
hypertension 27(20.1%)	Chronic kidney disease	3(2.2%)
Diabetes 17(12.7%)	Chronic liver disease	4(3.0%)
Diabetes 17(12.7%)	hypertension	27(20.1%)
13(9.7%) Neutrophil count (IQR;×10"L) 2.5(1.1-4.1) Lymphocyte count (IQR;×10"L) 0.6(0.4-1.1) COVID-19 treatment Antivirus ± corticots exids ± Immunoglobulin ± JAK inhibitor 56(41.8%) Corticots exids ± Immunoglobulin ± JAK inhibitor 47(35.1%)		
Lymphocyte count (IQR; × 10%L) 0.6(0.4-1.1) COVID-19 treatment 56(41.8%) Antivirus± corticostercids± Immunoglobulin±JAK inhibitor 56(41.8%) Corticostercids± Immunoglobulin±JAK inhibitor 47(35.1%)		
Lymphocyte count (IQR; × 10%L) 0.6(0.4-1.1) COVID-19 treatment 56(41.8%) Antivirus± corticostercids± Immunoglobulin±JAK inhibitor 56(41.8%) Corticostercids± Immunoglobulin±JAK inhibitor 47(35.1%)		
COVID-19 treatment Antivirus ± conticostercids ± Immunoglobulin ± JAK inhibitor Corticostercids ± Immunoglobulin ± JAK inhibitor 47(35.1%)	Lymphocyte count (IOR;×10%L)	
Antivirus ± corticosteroids ± Immunoglobulin ± JAK inhibitor 56(41.8%) Corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)		
Corticosteroids ± Immunoglobulin ± JAK inhibitor 47(35.1%)		56(41.8%)

	Favorable (n = 77)	Unfavorable (n = 57)	P value
Sex, Male/Female	45/32	31/26	0.639
Median age, (IQR; years)	60 (51-67)	66 (54-73)	0.015*
Median BMI (IQR)	23(20.6-25.6)	21.7(20-24.4)	0.189
Disease classification			
Acute myeloid leukemia	22	6	
B cell lyphoma (indolent/aggressive)	28(9/19)	32(16/16)	
Malignancy status at COVID-19 diagnosis			0.001*
Onset	29	6	
Stable	10	15	
Controlled	20	26	
Active	18	10	
Time from last treatment to COVID diagnosis			0.194
Untreated	21	9	
In the last month	34	25	
In the last 3 months / > 3 months	22	23	
Number of vaccines dose			
(<2/≥2)	26/51	35/22	0.001*
Neutrophil count (IOR; ×10°/L)	1.9 (0.7-3.6)	3.0 (1.6-5.4)	0.011*
Lymphocytes count (IQR;×10°/L))	0.7(0.4-1.2)	0.5(0.2-1.1)	0.313
Platelet count (IQR; g/L)	113 (46-174)	87 (38-131)	0.168
Immunoglobulin G level (mg/dI)	1188(786-1438)	867(645-1245)	0.038*
C-response protein (mg/L)	31 (8-83)	44(18-106)	0.096
Interleukin-6 level (pg/ml)	9.7(4.8-27)	15.8(8.3-51)	0.025*
Interleukin-6 level (pg/ml)	4.7 (3.4-10)	5.8 (4.3-10.3)	0.235

Favorable group is defined as patients with controlled infection; unfavorable group is defined as patients with persistent COVID-19 infection or succumbed to death within 30 days.



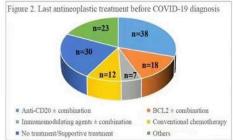


Figure 1