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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

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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)

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.

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Table 1 patient characteristics

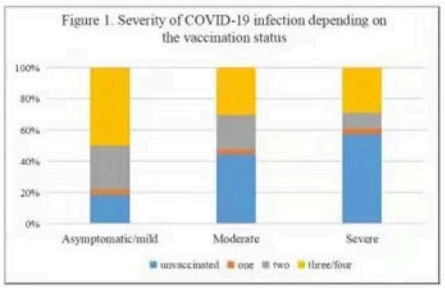
	N(%)
Total number of patiets	134(100%)
Median age at time of diagnosis, (IQR; years)	61(52-68)
Female sex	58(43.3%)
Median BMI (IQR)	22.5(20.4-24.7)
Hematologic malignancy	
Acute myeloid leukemia	28(20.9%)
MDS/MPN	16(11.9%)
Acute Lymphoid leukemia	7(5.2%)
B cell lymphoma	60(44.8%)
T cell lymphoma	9(6.7%)
Plasma cell disorders	10(7.5%)
Others (Castleman disease, NK lymphoma, Hodgkin's disease, Epstein-Barr virus-associated lymphoproliferative disorders)	4(3.0%)
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 3 months / > 3 months	45(33.6%)
Number of vaccines dose	
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	
Asymptomatic/mild	32(23.9%)
Moderate	63(47.0%)
Severe	39(29.1%)
Comorbidities before COVID-19	
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	3(2.2%)
Chronic liver disease	4(3.0%)
hypertension	27(20.1%)
Diabetes	17(12.7%)
Obesity	13(9.7%)
Neutrophil count (IQR; ×10⁹/L)	2.5(1.1-4.1)
Lymphocyte count (IQR; ×10⁹/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%)
Others(Immunoglobulin ± JAK inhibitor、plasma)	31(23.1%)

IQR=Inter-Quartile Range; BMI=Body Mass Index; MDS=Myelodysplastic syndromes; MPN=Myeloproliferative-neoplasms; JAK=Janus Kinase.

Table 2. Patient characteristics between 57 patients with unfavorable outcomes and others

	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 (IQR; ×10⁹/L)	1.9 (0.7-3.6)	3.0 (1.6-5.4)	0.011*
Lymphocytes count (IQR; ×10⁹/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/dl)	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 patietns with controlled infection; unfavorable group is defined as patients with persistent COVID-19 infection or succumbed to death within 30 days.



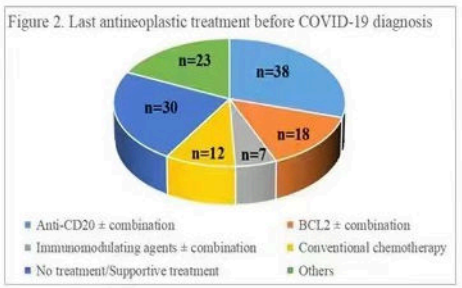


Figure 1