INCIDENCE AND SEVERITY OF COVID-19 AMONG INPATIENTS WITH HEMATOLOGIC MALIGNANCIES

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KEY WORDS: *: COVID-19, hematological malignancies, acute leukemia, lymphoma, multiple myeloma*

soho 2021 ANNUAL MEETING

Poster/abstract number AML-355

CONTEXT

COVID-19 has become the largest health crisis in recent history, with complex healthcare challenges in frontline and critical care settings, or in assisting patients with chronic diseases and cancer. Hematologic malignancies (HM) represent an additional factor for severe COVID-19, and mortality rates of 21%-62% for HM patients have been reported.

OBJECTIVE

To assess the incidence and severity of COVID-19 among HM inpatients.

DESIGN

We performed a retrospective analysis of electronic health charts of inpatients at Hospital Municipal São José (HMSJ) in Joinville, Brazil.

SETTING

One-year period selected considering the first COVID-19 case in Joinville on March 13.

PATIENTS OR OTHER PARTICIPANTS

Diagnosis of HM under the WHO classification and hospital stay for more than 48 hours were required. One hundred and seventeen consecutive HM inpatients, and 152 consecutive inpatients in the one-year period before COVID-19 in Joinville were included.

INTERVENTIONS

No intervention was carried out in addition to regular management of COVID-19.

MAIN OUTCOME MEASURES

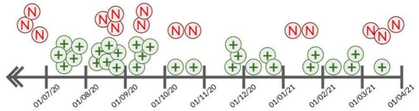
Mortality and incidence of COVID-19, severe disease and thrombotic events.

Table 1 - Main features of HM inpatients admitted between April 2020 and March 2021 with and without confirmed COVID-19 during hospital stay.

	HM inpatients without confirmed COVID-19	HM inpatients with confirmed COVID-19	*p*
Number of patients	88	29	-
Male gender (%)	45 (51%)	17 (59%)	*0.53*
Median Age (years; IQR)	59 (49-69)	58 (43-66)	*0.48*
Age ≥ 60 years (%)	41 (47%)	12 (41%)	*0.67*
Median ECOG-PS at hospital admission (IQR)	1 (1-2)	1 (1-2)	*0.73*
Hematological Malignancies			
Acute Leukemia	20 (23%)	10 (34%)	*0.23*
CLL (%)	4 (5%)	4 (14%)	*0.10*
CML and other CMN (%)	5 (6%)	2 (7%)	*1.00*
Lymphoma (%)	30 (34%)	8 (28%)	*0.65*
Multiple Myeloma (%)	16 (18%)	3 (10%)	*0.40*
Other (%)	13 (15%)	2 (7%)	*0.35*
Disease Status at Hospital Admission			
In Remission (%)	15 (17%)	5 (17%)	*1.00*
Relapsed or Refractory Disease (%)	23 (26%)	8 (28%)	*1.00*
Stable Disease (%)	4 (5%)	2 (7%)	*0.64*
Not Evaluable (Recent Diagnosis) (%)	31 (35%)	11 (38%)	*0.24*
Not Evaluable (Other) (%)	15 (17%)	3 (10%)	*0.55*
Median Hospital Stay (IQR)	18 (9-28)	22 (15-32)	*0.50*
Chemotherapy administration as inpatient (%)	59 (67%)	20 (69%)	*1.00*
Febrile Neutropenia (%)	33 (28%)	10 (35%)	*0.83*
Combined broad spectrum antibiotic treatment (%)	20 (23%)	22 (76%)	*<0.001**
Therapeutic use of antifungal agents (%)	6 (7%)	6 (21%)	*0.07*
In-hospital Mortality (%)	28 (32%)	19 (66%)	*0.002**

Figure 1 - Timelines of performed SARS-CoV-2 RT-PCR (A) and of HM inpatients with confirmed COVID-19 (B).

A



B

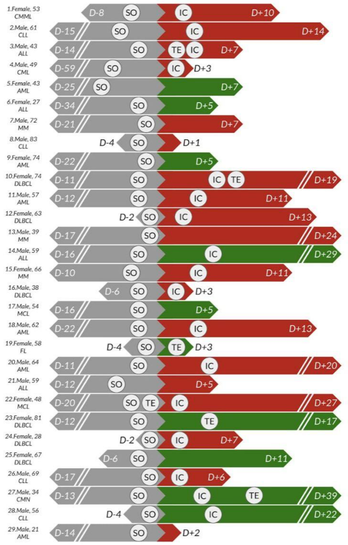


*Table 1: CLL: chronic lymphocytic leukemia; CML: chronic myeloid leukemia; CMN: chronic myeloproliferative neoplasm; ECOG-PS: Easten Cooperative Oncology Group Performance Scale; IQR: interquartile range; MM: multiple myeloma; * marks statistically significant differences, considering p value below 0.05.*

Figure 1A: Performed SARS-CoV-2 RT-PCR tests over time. N: negative test; +: positive test. No positive test was observed in the first three months of the reported one-year period.

Figure 1B: Timeline of all 29 HM inpatients with COVID-19. Grey lines indicate hospital stay before COVID-19 confirmation; parallel bars on the left indicate lines truncated at 10 days. D-8 indicates eight days of hospital stay before COVID-19 diagnosis. D+10 indicates ten days of hospital stay after COVID-19 diagnosis. Red lines indicate deceased HM inpatients with COVID-19; green lines indicate surviving HM inpatients with COVID-19; parallel bars on the right indicate lines truncated at 15 days. AML: acute myeloid leukemia; ALL: acute lymphoblastic leukemia; CLL: chronic lymphocytic leukemia; CML: chronic myeloid leukemia; CMN: chronic myeloproliferative neoplasm; DLBCL: diffuse large B-cell lymphoma; FL: follicular lymphoma; IC: admission to intensive care unit; MCL: mantle cell lymphoma; MM: multiple myeloma; SO: symptom onset; TE: thrombotic event.

RESULTS

COVID-19 cumulative incidence for HM inpatients was 25%, with one COVID-19 positive test every 73 patienthospital days. Very likely nosocomial transmission was seen in 19 cases (66%). Chemotherapy was administered within 30 days of symptom onset in 19 patients (66%). Severe neutropenia and severe thrombocytopenia were seen in 10 (34%) and 13 (45%) patients. For HM inpatients with and without COVID19, most common diagnoses were acute leukemia, (34% and 23%, respectively; p=0.23), lymphoma (28% and 34%; p=0.65) and multiple myeloma (10% and 18%; p=0.4) Severe COVID-19 was established in 22 patients (76%), with 16 (55%) intensive care unit (ICU) admissions and 19 deaths (66%). TE were reported in 6 patients. Thrombocytopenia prevented anticoagulation in 11 patients (50%). In-hospital mortality was 66% for HM inpatients, versus 32% for HM inpatients without COVID-19 (p=0.002), and 23% for pre-COVID-19 HM inpatients (p<0.001).

CONCLUSIONS

Cumulative incidence of COVID-19 in HM inpatients and the higher mortality over this one-year period are very alarming. As vaccination efforts are currently in expansion worldwide, it is uncertain whether hospital care for HM will carry on without inpatient transmission. Collaborative studies reporting on COVID-19 outcomes of HM inpatients are needed to guide decisions in this population.