

Original Research Paper

# Nursing Management of Frail Patients with Hematologic Malignancies During COVID-19 Pandemia in the Viterbo Domiciliary Care Unit: Data Analysis from March 2020 to March 2021

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**Abstract:** Background In the Viterbo province, a Domiciliary Hematologic Care Unit (DHCU) for assistance to frail patients (pts) with hemopathies Methods To evaluate the role of nursing management for frail pts followed by DHCU during the first year of the COVID-19 pandemic, all nursing activities from 3/2020 to 3/2021 were analyzed. Results Overall, 107 pts in 43 municipalities of Viterbo province were followed by DHCU nurses. The median distance from the DHCU central site to the house was 25 Km Interquartile Range (IQR) 16-34. A total number of 2609 nursing accesses was done in the whole period. According to different procedures, 1152 blood samples were performed, with a median number of 7 (IQR 3-15) for each pts: Moreover, there were 1040 accesses for Chemotherapy (CHT) administration and 417 accesses for other procedures (260 catheter medications, 125 therapy other than CHT, 32 nursing assistances of transfusions or marrow aspirates). Only 2 pts (1.8%) developed COVID-19 infection while in home care. Conclusions Domiciliary nurse assistance during the COVID-19 pandemic allowed to follow in a safer way >100 frail pts with hemopathies in a wide geographic area. This approach should represent the best type of assistance for frail pts even beyond the COVID-19 pandemic.

**Keywords:** Home-Care Assistance, Frailty, Hemopathies, Chemotherapy, COVID-19

## Introduction

Clinical and therapeutical management of patients with hematologic malignancies is largely based on the Day Hospital/Ambulatory (DH/A) setting, to avoid hospital admission of patients and minimize infective risk linked to in-patient recovery. However, this approach is often hampered by several patient features that make difficult and unsafe to reach the DH/A location: In particular, very old age, poor Performance Status (PS), comorbidities affecting patient mobility, distance from DH/A nearest site, unavailability of caregivers are the main problems affecting DH/A management of these patients (Yanada *et al.*, 2015; Hubscher *et al.*, 2021).

To face with this issue, home-care management could offer a suitable and safer alternative (Murthy *et al.*, 2019; Mittaine-Marzac *et al.*, 2022). At present, however, this approach is still underused in many countries: Moreover, even when a home-care unit is available, its role is very often limited to palliative and transfusional management only (Niscola *et al.*, 2006; Kaiser *et al.*, 2017; Cartoni *et al.*, 2021).

In addition, the recent SARS-CoVID-19 pandemic occurrence in early 2020 has profoundly changed our perspectives on the management of health systems all over the world. In particular, frail patients with severe pre-existing or concomitant diseases were considered at very high risk of morbidity and mortality from COVID-19 infection and several studies reported high incidences of

COVID-19 infections among patients with hematologic malignancies (Passamonti *et al.*, 2020; Vijenthira *et al.*, 2020; Hus *et al.*, 2021; Wood *et al.*, 2020).

In the Viterbo province is operative a Domiciliary Hematologic Care Unit (DHCU) for home-care medical and nursing assistance to frail patients with hemopathies: The Aim of the present analysis was to evaluate DHCU impact and efficacy in the nurse management of these patients during the first COVID-19 pandemic phase from March 2020 to March 2021.

## Materials and Methods

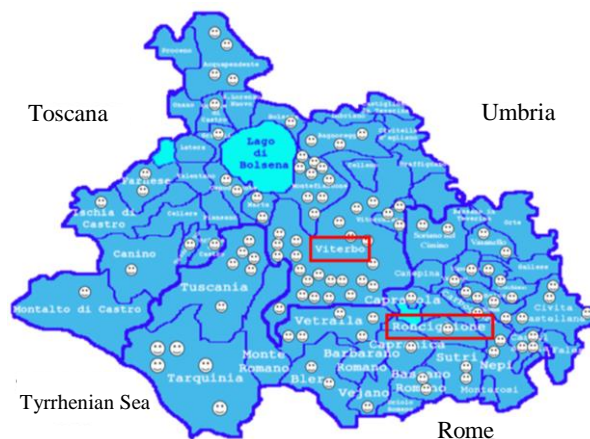
Viterbo province is a large area of 3612 Km<sup>2</sup> located in the north part of Latium with a median distance from Rome of about 80 Km and divided into 60 municipalities, many of them located in a mountain territory (Fig. 1).

In the context of the Hematology Unit of Viterbo, a DHCU was introduced from January 2010 for the active clinical assistance at the home of frail patients with hematologic malignancies. The two sites from which DHCU is done are Belcolle Hospital in Viterbo and Sant'Anna Hospital in Ronciglione, in the south part of the province: All the 60 municipalities are served by DHCU, independently by the distance from DHCU sites. Enrolment in the DHCU setting is proposed by physicians of the hematologic ward or DH/A setting and approved by physicians responsible for DHCU activity.

DHCU nursing activities are done by 4 dedicated nurses, who cooperate with two dedicated physicians in the management of patients. During the COVID-19 pandemic, DHCU nurses were employed to avoid as much as possible risks of viral contagion due to hospital admissions in DH/A or ordinary admission settings of our patients. The main nurse activities were categorized into the following two groups:

- Activities of specific nurse relevance: Blood samples, Central Venous Catheter (CVC) medications, samples of infected sites, some subcutaneous/intravenous chemotherapies (azacytidine, bortezomib), antibiotic treatments and other infusional treatments not requiring medical assistance, COVID-19 diagnostic tests
- Nurse assistance to activities requiring medical management: Red blood cells and platelet transfusions, marrow aspirates and bone marrow biopsies, some chemotherapies requiring medical presence (decitabine, polychemotherapy cycles, monoclonal antibodies), COVID-19 vaccination

For the present report, all nursing activities performed by DHCU from March 2020 to March 2021 in the lockdown framework were collected and analyzed.



**Fig. 1:** Map of Viterbo province with patients disposition: Each pin in the map represents a single patient followed by DHCU during the study period. The 2 boxes indicate DHCU starting sites

## Statistical Methods

For all cases included in the study, patient characteristics, including demographics, type of disease, phase of the disease, concomitant diseases, cause of enrolment by DHCU, and treatments, were collected in a database specifically created on Excel program.

Data were summarized as mean and standard deviation, median and Interquartile Range (IQR), or absolute frequency and percentage, as appropriate.

## Results

On the whole, 107 patients living in 43 different municipalities of Viterbo province were followed by DHCU nurses in the study period: Of them, 41 (38.3%) were newly diagnosed and in the first line of treatment, mainly affected by Multiple Myeloma (MM) and Acute Myeloid Leukemia (AML)/High-Risk Myelodysplastic Syndromes (HR-MDS) unfit for intensive treatment but eligible for Hypomethylating Agents (HMA). The main features of the patients at baseline of home-care assistance are reported in Table 1.

At the beginning of the study period (08/03/2020), 37 patients (34.5%) were already followed by DHCU, while 70 (65.5%) entered home-care assistance during the year considered in the study: The main reasons for enrolment in the DHCU setting were motility impairment and older age (Table 1).

Patients distribution in the Viterbo province is shown in Fig. 1. Median distance from DHCU central sites to the patient house was 25 Km [IQR 16-34]: Distance from DHCU was <20 Km in 32 cases (29.9%), ≥20 <40 Km in 57 (53.2%) and ≥40 Km in 18 (16.9%).

**Table 1:** Patient clinical features at baseline of home-care nursing management

N° of patients	107
M/F, n° (%)	61/46 (57.0/43.0)
Median age, years (IQR)	74.5 (67.4-80.6)
Diagnosis, n° (%):	
Acute myeloid leukemia	17 (15.8)
Acute lymphoid leukemia	3 (2.8)
Myelodysplastic syndromes	11 (10.3)
Multiple myeloma	44 (41.1)
Non-Hodgkin lymphoma	17 (15.8)
Chronic lymphocytic leukemia	3 (2.8)
Other hemopoietic diseases	12 (11.4)
Phase of disease, n° (%):	
1 <sup>st</sup> line treatment	41 (38.3)
Resistant to 1 <sup>st</sup> line treatment	6 (5.6)
1 <sup>st</sup> relapse	16 (14.9)
2 <sup>nd</sup> or following relapse	11 (10.3)
Chronic phase/maintenance/untreated	33 (30.9)
Reason for domiciliary management, n° (%):	
Age only	22 (20.6)
Symptoms burden	21 (19.6)
Performance status $\geq 2$ (ECOG)	6 (5.6)
Motility impairment	33 (30.9)
Social/familiar disability	10 (9.3)
Prevention of COVID-19 infection	15 (14.0)

A total number of 2609 nursing accesses was done in the whole period. According to different procedures, 1152 blood samples were performed, with a median number of 7 samples (IQR 3-15) for each patient: In addition, there were 1040 accesses for chemotherapy administration (108 cycles of azacytidine in 15 patients with AML/HR-MDS, 87 bortezomib-based cycles in 30 patients with MM, 16 administrations of other chemotherapies in 2 patients) and 417 accesses for other procedures (260 venous catheter medications, 125 therapies other than chemotherapy, 32 nursing assistances of red blood cells or platelets transfusions or marrow aspirates).

In addition, 20 patients were vaccinated at home with their respective caregivers. During the entire study period, 2 patients (1.8%) developed COVID-19 infection while in home care.

At the last follow-up (31/03/2021), 59 patients (55.1%) were alive and still followed by DHCU, 20 patients (18.6%) were alive and returned to DH/A setting due to improvement of clinical conditions and 28 patients (26.3%) died while in domiciliary assistance.

## Discussion

The best management of patients with hematologic malignancies still remains a matter of debate and the current standard approaches (DH/A and hospital admission in hematologic wards) are often insufficient to offer the same chances of cure to all patients: In particular, elderly patients, patients with poor PS and/or motility

impairment and patients with logistic/social difficulties (distance from hematologic structure, lack of adequate caregivers) are in many cases excluded by potentially curative approaches.

The availability of home-care assistance could reduce this gap, allowing wider accessibility to standard treatments also to older and frailer patients with hematologic malignancies. Unfortunately, home-care assistance is still present in few hematology Centres and is very often devoted only to palliative treatments: This last point should be emphasized, as the palliative approach is certainly useful for patients in the terminal phase of disease but at present a new concept of home-care assistance is needed to guarantee active therapies to all patients.

In this context, the occurrence of the COVID-19 pandemic has further complicated the standard approach in DH/A of these patients, adding severe infective risks and making even more difficult access to hematologic Centres. To our knowledge, only one previous experience of home care assistance during the COVID-19 pandemic is already present in the literature (Gomez-Centurion *et al.*, 2021), reporting data from a tertiary hospital in Madrid on a cohort of hematologic patients living within a 30 min drive from the hospital and in different clinical phases of disease (early discharge after consolidation for AML or autologous stem-cell transplantation, courses of antibiotics/electrolyte replacement, treatment of AML/MDS or MM with subcutaneous therapies): This approach resulted safe and feasible, with reduced time of hospitalization.

In the present study, we aimed to test in a wider geographic area with many natural barriers the role of nursing home-care assistance in the framework of lockdown during COVID-19 first phase of the pandemic. Present data highlight the feasibility and efficacy of such a domiciliary approach: The availability of 4 nurses in the DHCU setting allowed to follow in a safer way compared to standard DH/A and ordinary admission settings more than 100 frail patients with hematologic malignancies, most of them in 1<sup>st</sup> or subsequent active lines of therapy, in a wide geographic area. Looking at the main reasons for enrolment in the DHCU setting (Table 1), it is evident that many of these patients would be left untreated and assigned only to palliation in the absence of adequate assistance at home.

Moreover, our data outline that the vast majority of procedures might be performed in a safer way at home by nurses, either alone or in cooperation with dedicated physicians, with the obvious exceptions of very intensive or prolonged infusional approaches such as induction/consolidation phase of acute leukemias or transplant procedures.

It is worth noting that the rate of COVID-19 infections in patients followed by DHCU (1.8%) was lower than in

the general population of Viterbo province (>10%) in the same period of time: This points to the utility of DHCU nurse management in reducing all infective complications in such patients.

In conclusion, this approach should represent the best type of nurse assistance for a significant portion of hematologic patients, even beyond the COVID-19 period of pandemics.

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## Author's Contributions

**Silvia Ciambella, Assunta Silvestri, Marco Montanaro and Roberto Latagliata:** Coordinated the data analysis and contributed to the writing of the manuscript.

**Vincenza Innocenti, Elisa Emanuelli Cippitelli, Roberta Perazzino, Roberta Talucci, Alessia Fiorini, Ambra Di Veroli, Caterina Mercanti, Fiammetta Natalino, Gioia De Angelis, Michela Tarnani, Marco Morucci and Giulio Trapè:** Patient management and data collection.

**Valentina Panichi and Giuseppe Topini:** Laboratory data collection and analysis.

**Cristina Mastini:** Data collection and general support.

## Ethics

This article is original and contains unpublished material. The corresponding author confirms that all of the other authors have read and approved the manuscript and that no ethical issues are involved.

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