

How we deal with the COVID-19 epidemic in an Italian paediatric onco-haematology clinic located in a region with a high density of cases

The first cases of the novel COVID-19 coronavirus in Italian patients, following the epidemic in China which began in December 2019, were reported on 20 February 2020. Since then, 15 362 deaths and over 124 632 positive cases have been registered at the time of writing. The Veneto region and the city of Padua were among the first Italian areas to be affected by the pandemic and have thus far registered a high number of positive cases and deaths.

The clinical and epidemiological data from the Chinese population indicate that paediatric patients are less affected than adults,^{1,2} as they usually present with either a paucisymptomatic form of the disease or, in some cases, with mild and rarely fatal symptoms. However, the concern for paediatric patients with onco-haematological diseases, particularly those actively undergoing chemotherapy or other immunosuppressing treatments, has led us to establish a series of measures aimed at minimizing contagion as much as possible, also bearing in mind the high risk of transmission of the virus within hospitals. Of note, recent literature in a very small cohort of oncologic patients suggests a high mortality rate upon COVID-19 exposure.^{3,4}

The Padua Paediatric Oncology, Hematology and Stem Cell Transplant Center is a third level regional referral centre for paediatric onco-haematological diseases with a total population of over 1500 patients under direct care, and over 16% of these patients come from outside the region. It has 19 dedicated hospital beds for oncology patients and six HEPA-filtered and positive-pressure beds in the haematopoietic cell transplant (HCT) unit that is separated from the general ward. Approximately 60 patients access the outpatient clinic daily.

A few days after the first deadly cases, Italy started deploying tight security measures, including massive lockdowns and social distancing to try to flatten the epidemic curve and allow the healthcare system to cope with the emergency. Starting 24 February 2020, stringent measures were undertaken in our centre to guarantee continuity of care to all patients and, at the same time, protect patients, care givers and staff from the pandemic. The measures focus on avoiding crowding, establishing procedures for preventing exposure and infection of patients who have undergone chemotherapy, and sensitizing health professionals and families to the general recommendations provided by the Italian Government for reducing spreading of COVID-19.

In particular, to reduce crowding:

In the inpatient unit non-urgent admissions were postponed, but oncology patient treatment, inclusive of HCT, was guaranteed at all times; care giving was reduced to a single adult during the entire inpatient stay and visits from other relatives were suspended; during the hospitalization, patients and care givers are requested to remain in their rooms in isolation; all non-medical activities including schooling, laboratory, and any form of voluntary work were temporarily suspended; rotations of clinical staff were reduced to the minimum needed to guarantee quality of care.

In the outpatient clinics non-urgent outpatient visits were postponed, following phone-based triage; visits for essential treatments and evaluations were distributed over the day in order to minimize the number of patients (and care givers) present in the unit; care giving was reduced to a single adult during the entire stay and all non-medical activities were temporarily suspended; home-based treatment has been substantially increased to offer blood tests, antibiotic and some chemotherapy treatments at home, provided by doctors and nurses from the unit.

To prevent viral exposure and spread among our patients' population and staff:

Before entering the inpatient unit, each patient and the accompanying care giver undergo COVID-19 testing by a nasopharyngeal swab; availability of negative test results is mandatory for inpatient unit access. To apply this strategy and at the same time reduce the risk of exposure to the virus in our population at high risk, a 24-hour emergency area with two rooms for short-stay observation has been organized for our patients in a building separate from the general paediatric emergency room. Before being admitted to the inpatient unit, all patients with urgent problems are evaluated and treated in this facility, if necessary, until the results of the COVID-19 screening are available. Swab turnaround time ranges between 6 and 72 h. Patients with a negative test results would then be admitted to the inpatient clinics to continue urgent treatment, as per their needs. For scheduled admissions, each patient and care giver is screened for COVID-19 before hospitalization.

Before entering the outpatient facility, patients undergo a phone or in-person triage process in order to identify those

at risk. The triage consists of a detailed anamnesis to identify possible exposure, addressing any contacts with positive patients, sick cohabitants, or the presence of symptoms (focusing on cough, cold/rhinorrhoeas, sore throat, conjunctivitis, diarrhoea and vomiting, anosmia) in the patient or in the care giver, and measurement of body temperature. Triage is considered positive when exposure, symptoms or body temperature $>37.2^{\circ}\text{C}$ are identified (one finding is considered sufficient). In case of positive triage, patients are accompanied into a dedicated area where they are evaluated and cared for in isolated rooms by dedicated and properly-vested and trained personnel, while awaiting for the results of COVID-19 testing on a naso-pharyngeal swab. In case of positive triage of the care giver, replacement is required. Patients in febrile aplasia carrying central lines are considered suspicious for COVID-19 at triage, they follow the path of triage-positive patients, but they are simultaneously treated according to local and international guidelines for the presenting clinical event in the isolation room until the swab test result is available. If negative they are admitted in the ordinary Onco-Haematology Unit, if positive in dedicated areas of the Paediatric Department.

In agreement with national guidelines, frozen grafts are preferred for allogeneic haematopoietic cell transplantation.

In the outpatient clinics, patients, care givers and staff wear protective masks during their entire stay in the ward.

Patients at discharge receive protective masks with recommendations to use them whenever out of their domicile; in particular, at discharge and when exiting their rooms/the facility (i.e. for diagnostic instrumental tests executed outside the ward) hospitalized patients received N95 masks or, in the case of very young children, double surgical masks. The same were used by patients during their stay in the outpatient facility. Care givers use surgical masks at all the time.

No changes in the standard management of neutropenic patients at home were introduced, and in particular no additional prophylaxis was started due to the pandemic.

All staff members have been actively screened to detect COVID-19-positive cases as early as possible; in particular, staff members are screened once every 10 days in the absence of symptoms; in case of close contact with a positive subject staff is being monitored as per local guidelines.

All staff wear protective N95 masks during all the time spent on the ward. Staff members with symptoms or suspected exposure at domicile are asked to stay at home and are screened for COVID-19.

Cleaning schedules have been intensified to twice a day.

To increase awareness in health professionals and families to the general recommendations provided by the Italian Government for reducing spreading of COVID-19, fact sheets containing the ministerial recommendations for hand washing, the use of masks, and other relevant information have been displayed on the premises and actively distributed to patients.

Overall, in a six-week-period since establishing these measures, we screened at triage for COVID-19 over 855 patients and tested 31 patients for COVID-19 using naso-pharyngeal swabs. An additional 28 inpatients were tested because of symptoms. Furthermore, 6559 patients (65 tests) and 66 care givers were tested for COVID-19 per screening procedures, as described above. Members of the staff (108 individuals) were tested on average twice in the six-week period. None of the tested individuals resulted positive at testing. Thus in our cohort of patients, care givers and hospital or clinic staff sharing the above-described precautions, no positive cases have thus far been registered (0 positive swabs out of more than 500 swabs performed). This is different from the frequency of positive naso-pharyngeal swabs detected in the general population of our region that is currently estimated to be 8.2%. Thus, in our region with high COVID-19 incidence, the adoption of preventive measures was thus far effective in protecting a population at risk from infection.

In case a positive patient is identified, according to our procedure his/her overall clinical situation would be considered, including type and state of the disease, treatment phase and chemotherapy intensity, to reach a consensus on management. In general terms, we would consider temporarily delaying any further chemotherapy until the COVID-19 infection is resolved. Positive oncologic patients in case of need would be hospitalized in a dedicated area of the Paediatric Department in negative-pressure, single rooms with restricted access.

Positive staff members should be isolated at home if with no or mild symptoms or hospitalized as per their clinical needs, and would be readmitted upon resolution of symptoms and availability of at least two consecutive negative swabs. Staff members who care for positive patients/have had contact with positive cases without protection devices would be isolated at home for 14 days or voluntarily attend the hospital wearing protective devices and receiving regular monitoring, as per local standards.

We have not yet organized a specific survey of the perception of these interventions by patients and care givers, but the perceived feeling is generally positive; they appreciate the effort to protect them from possible contagion and accept the restrictions. No economic evaluations have been performed, nor have they guided our actions. Sufficient Personal Protective equipment has been available for the patients' and care givers' needs.

As this outbreak is a sanitary emergency and a challenge for the healthcare system, active sharing of the procedures established by the centres hit early by the pandemic is key to addressing the compelling needs of fragile patients and to contributing in the successful management of the COVID-19 pandemic.

Laura Sainati

Alessandra Biffi 

Department of Women and Child Health, Pediatric Oncology, Hematology and Stem Cell Transplant Center, Padova University Hospital, Padua, Italy.

*E-mail: alessandra.biffi@unipd.it

References

1. Guan W-J, Ni Z-y, Hu Yu, Liang W-H, Ou C-Q, He J-X, et al.; China Medical Treatment Expert Group for Covid-19. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med*. 2020. <https://doi.org/10.1056/NEJMoa2002032> [Epub ahead of print].
2. Ludvigsson JF. Systematic review of COVID-19 in children show milder cases and a better prognosis than adults. *Acta Paediatr*. 2020.
3. Lu X, Zhang L, Du H, Zhang J, Li YY, Qu, J, et al.; Chinese Pediatric Novel Coronavirus Study Team. SARS-CoV-2 Infection in Children. *N Engl J Med*. 2020.
4. Liang W, Guan W, Chen R, Wang W, Li J, Xu K, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *Lancet Oncol*. 2020;21:335–7.