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To keep a COVID-19-free hospital ward: mission possible?

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During the pandemic outbreaks of coronavirus disease 2019 (COVID-19), in Italy, some hospitals became fully-dedicated COVID-hospitals, whereas in most of the others, a large number of units with different degrees of intensity of care were converted or created to treat COVID-19 patients. However, some “no-COVID-19” wards were kept to assist patients in need of hospital care and without COVID-19 disease. At the Città della Salute e della Scienza, Molinette, a University-teaching hospital in Turin, north-western Italy, four medical units were converted as COVID-19 wards, and two were designated to remain no-COVID-19 wards. We report our experience within a no-COVID-19 acute Internal Medicine and Geriatric ward, where patients without clinical signs and symptoms of COVID-19 and/or with negative SARS-CoV2 viral genome detection using real-time reverse-transcription polymerase chain reaction (RT-PCR) on samples obtained with naso-pharyngeal swabs (NPSs), were admitted.

To increase the safety of patients and personnel, since the beginning of March 2020, we defined two separate sections within our 28-bed ward: one was dedicated to patients with confirmed or suspected infectious diseases and the other was reserved for patients admitted for non infectious diseases. Relatives' visits were not allowed in both parts of the ward. In keeping with the recommendations from the national Superior Institute of Health, SARS-CoV2 NPS testing in the Emergency Department (ED) was initially addressed to persons with symptoms and/or signs suspected for COVID-19 and/or suspected exposure to a SARS-CoV-2 positive person, and the same rules applied to hospital staff [1]. During

the study period, along with rapid community spreading of COVID-19, there was a wider adoption of SARS-CoV2 NPS testing in patients admitted to the ED. Due to shortage of personal protective equipment (PPE) use of protection dressing (coat, surgical face mask, gloves) for medical staff and nurses was initially authorized within the infectious area when caring for patients with recognized or suspected respiratory infections.

During the period between March 18th and April 24th, 2020, 81 patients (mean age 81.5 ± 9.3 years, 64.2% men) were admitted. Main causes of admission were decompensated heart failure (24.7%), infections (23.5%), anemia and other blood disorders (6.2%), acute renal failure (4.9%), malignancy (4.9%), and respiratory failure (3.7%). A negative SARS-CoV2 NPS test in the ED was available in 47 of the 81 admitted patients (58%). During hospital-stay (mean 8.2 days), 45 SARS-CoV2 NPS tests were performed, including 26 tests in the 47 patients with a previous negative test at entry (55.3%) and 19 in the 34 patients who did not have a previous SARS-CoV2 NPS test at entry (55.9%). Among the 81 patients admitted, a diagnosis of SARS-CoV-2 infection was made in 25 (30.8%) patients (mean age 77.8 ± 10.3 years, 52% men). Nine cases (36%) occurred among patients admitted for infectious diseases, and 16 (64%) cases were diagnosed among patients admitted for other medical disorders and without documented or suspected infection at entry. Of the 25 SARS-CoV-2 infection diagnosed, 15 were detected in patients with a negative NPS test at entry (5 of them with at least another negative test during hospital-stay) and 10 cases were documented in patients who did not undergo NPS test in ED (4 of them with at least one previous negative test during hospitalization). The median time between the first negative SARS-CoV-2 NPS test and the first positive test was 10 days. In 52% of cases, the SARS-CoV-2 NPS test was performed in patients with new onset of symptoms or signs suggestive

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for COVID-19, but in the remaining 48% of cases it was performed in asymptomatic patients at risk of environmental contagion or for other reasons. Meanwhile, SARS-CoV-2 infection was diagnosed in two senior physicians (both with symptoms/signs), two residents (with symptoms/signs) and seven nurses (2 with symptoms/signs), but we were not able to ascertain among patients and hospital staff who was first infected. Staff members were not periodically screened for SARS-CoV-2 infection, which was performed only in subjects with documented exposure to positive cases, either among patients or other staff members. Indeed, several members of the ward staff who developed symptoms COVID-19 like, but without a documented exposure to a SARS-CoV-2 positive person, were put in a 2-week period of home isolation but did not undergo SARS-CoV-2 NPS test.

In consideration of the persistent circulation of SARS-CoV-2 infection within the ward, on April 25th a more stringent protocol was adopted, with implementation of full PPE in both wings of the ward. At May 11th only one new case of SARS-CoV-2 infection was diagnosed in a member of nurse staff.

Our findings demonstrate that there is a not negligible risk of “hospital-acquired” SARS-CoV-2 infection, both for patients and for hospital staff, particularly within overcrowded supposed no-COVID-19 wards. A substantial proportion of SARS-CoV-2 infected persons may be asymptomatic and, on the other side, a negative SARS-CoV-2 NPS does not exclude a potential risk of contagion. Indeed, several variables in real-life conditions—including sampling and laboratory techniques, timing within the clinical course of infection and inadequate patient’s collaboration—may account for an increased risk of false negative results, which are more common than initially thought [2–5].

In view of the feared second wave of COVID-19, the recent experiences should inform our future.

Along with dealing with the needs of older COVID-19 patients after hospital discharge [6, 7], both strategies to control the spread of SARS-CoV-2 infection and surveillance models need to be expanded, with systematic adoption of PPE also within supposed no-COVID-19 or “gray” wards, increasing SARS-CoV-2 testing (and contact-tracing) at very low level of clinical suspicion both for patients and staff members [8], and respecting, whenever possible, patients’ isolation and safety distancing. Breaking this hospital-based vicious circle of infection, occurring mainly within no-COVID-19 areas, is paramount to increase hospital safety during the COVID-19 era.

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