

## SPECIAL ARTICLE

Running title: Lessons learned from COVID-19

### Lessons Learned from COVID-19 Pandemic in Italy. A Commentary.

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## **Abstract**

Since the COVID-19 outbreak, Italy has been one of the most affected countries in Europe and the second for number of deaths. In this commentary, we discuss some lessons that we learned as healthcare providers working in a large public hospital during the pandemic, with a special focus on the importance of infection containment and early diagnosis, the role of swab, serological tests, home isolation and individual protection devices, and the available therapies and management indications to better face a possible new outbreak in the near future. These comments should stimulate a more diffused, efficient and efficacious management of COVID-19 patients, also reducing the number of accesses to hospital emergency departments and the related spread of the infection.

**Keywords:** COVID-19, SARS-CoV-2, Early Diagnosis, Prevention.

## **Introduction**

The Severe Acute Respiratory Syndrome CoronaVirus-2 (SARS-CoV-2) pandemic had dramatic effects on most countries worldwide (1-3); Italy is one of the most affected countries in Europe and the second for number of deaths (4-6).

The pandemic also severely affected the population and, especially, healthcare providers in many disciplines including general practitioners, anesthesiologists, otolaryngologists and infectious medicine specialists (7, 8). In this commentary, we discuss some lessons that we learned as healthcare providers working in a large public hospital during the pandemic, with a special focus on the importance of infection containment and early diagnosis, the role of swab, serological tests, home isolation and individual protection devices, and the available therapies and management indications to better face a possible new outbreak in the near future.

*First lesson: Infection containment and early diagnosis.*

Reports from the last century on the pandemic of 1918 stressed the importance of isolation and home therapy (9). This recommendation is also topical during this pandemic. In fact, conveying and directing affected people towards hospitals, that became the first places of the spread of the infection, can be a serious mistake (10).

Instead, it is necessary to empower territorial medicine allowing general practitioners to go to the patients' home with proper personal protective equipment (PPE) to perform SARS-CoV-2 swab at home and identify and isolate positive subjects at an early stage. Individual isolation and early medical therapy may allow the prevention of severe pulmonary complications that require hospitalization and intensive care and limit the spread of the infection (11).

However, the difficulties and inefficiency of territorial medicine and the scarcity of swabs and PPE, especially during the initial phase of the pandemic, have increased the number of COVID-19 positive patients admitted to hospitals, contributed to the spread of the infection and to a higher mortality rate in the general population and in healthcare personnel (12).

During the pandemic, many hospital structures appeared inadequate for both the scarcity of intensive care units (ICU) beds and the lack of an appropriate number of highly specialized personnel, such as anesthesiologists. In addition, the reallocation of personnel to other departments and the merge of many units during the pandemic sometimes facilitated spreading the infection among hospital units; it was only later understood the importance of identifying structures reserved to COVID-19 patients. At this regard, monobloc hospitals experienced more difficulties to predispose separate routes and isolate COVID-19 patients compared to structures with separated buildings. This architectural detail should be considered in the future, when dedicated hospitals geographically distributed in the urban consular peripheral areas should be identified and dedicated to the management of affected patients.

#### *Second lesson: Swab, serological test, home isolation and individual protection devices*

The execution of nasopharyngeal swab for SARS-CoV-2 has been a critical topic in Italy. As of May 2020, nearly 70 days after the beginning of the lockdown in our country (March 10, 2020), a large

portion of the healthcare personnel has not performed the swab (5). Specific kits for serological testing that identify and quantify Immunoglobulins G and M for SARS-CoV-2 infection are now available and should be performed in healthcare workers and – if possible – in the entire population (13). In case of serological positivity, a nasopharyngeal swab should be performed, allowing for early identification and isolation of potentially positive subjects.

Home isolation is another important element. Positive individuals should be isolated for a period of at least 4 weeks, and swabs should be performed at home at regular intervals to monitor disease progression and healing. It is important to understand that – to date – the timing of positivity for SARS-CoV-2 immunoglobulins is still unknown and this should be taken into account when declaring a patient as “negative” and discharge him from home or hospital isolation (13).

PPE play a central role in preventing SARS-CoV-2 spread, and their shortage especially in the first weeks has been reported (14). Wearing PPE such as masks and gloves outside home, in public places or public transports is of utmost importance to prevent contagion and infection spread, as well as the generic recommendation of frequently washing hands. Healthcare personnel must be provided with complete and adequate PPE, including FFP2 or FFP3 masks, hats, goggles, gloves and full-length gowns. Precise safety protocols for dressing and undressing procedures should be followed.

### *Third lesson: Therapy and management indications*

In the recent months, dozens of drugs and therapeutic protocols have been proposed to treat COVID-19; however, to date no vaccine and specific therapies have been validated (15). Therapies currently used in COVID-19 patients include antibiotics (third-generation macrolides/cephalosporins) and corticosteroids; validation of hydroxychloroquine is being sought in the early stages of lung involvement; further studies will be necessary for the use of monoclonal inhibitors of the inflammatory cascade reaction (16). The use of low molecular weight heparins to cope with some dramatic clinical manifestations of COVID-19 infection is now widespread, and studies involving the

use of fresh plasma from probably immune donors are being validated. In any case, therapies should be tailored on individual patient status and clinical conditions (17).

A territorial-based healthcare structure should provide home assistance to patients; this structure should be divided into a centralized operational unit that coordinates medical and paramedical staff, and an external operative unit for diagnostic and therapeutic management of patients according to the guidelines and the protocol developed (18). The operational center should have an expert doctor in contact with the external operative unit, that would be ready to indicate additional therapeutic interventions.

## **Conclusions**

The experience accumulated in the first months of the pandemic suggests that COVID-19 patients should be diagnosed and managed at home, especially in the early phases and when clinical conditions do not require hospitalization or intensive care. PPE should always be used for individual protection and to prevent the spread of the infection. Serological tests should be extensively performed in the healthcare and general population; in case of serological positivity, a nasopharyngeal swab should be performed for early identification and isolation of infectious subjects. Specific architectural hints in hospital construction should be considered to face future pandemics.

These recommendations would allow a more diffused, efficient and efficacious management of COVID-19 patients, also reducing the number of accesses to hospital emergency departments and the spread of the infection.

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