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European Journal of Emergency Medicine 2020, 27:309

Keep or release: experience on management of COVID-19 during maximum emergency in Bergamo and impact on patient outcomes

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Received 18 April 2020 Accepted 24 April 2020

The most efficient use of the emergency department and intensive care units is highly critical in optimizing the response to the dramatic increase in demand caused by the coronavirus disease 2019 (COVID-19) pandemic. This is especially true in the event of a severe crisis of the healthcare structures due to the rapid outbreak of COVID-19. We describe our retrospective experience on a systematic triage adopted for patients admitted to the emergency department of Humanitas Gavazzeni Hospital, in Bergamo, the area with the highest daily incidence of COVID-19 cases in Italy during the time of the maximum unexpected influx of patients.

Between 7 and 16 March 2020, 612 patients were admitted to the emergency department; 443 (72.3%) had acute flu or respiratory symptoms, and of these 397 (89.4%) had an initial diagnosis of COVID-19 infection based on the positive test or highly suggestive chest radiograph. In order to manage the overwhelming demand, considering the limitations of available resources in structures, devices and personnel, it became critical to develop a decision tree to identify less severe patients, discharge them as quickly as possible and establish home-based management. The decision to discharge was based on two main parameters, in addition to the clinical status of the patient: (1) SpO₂ >92% and (b) negative walking test, defined as changes in SpO₂ of <3% after a 6-min walk test. A total of 115 of the 397 patients (76.5% M) with a mean age of 61 years (range 25–91) were discharged based on the above parameters. Most (84.3%) were found to be COVID-19 positive; home-based treatment was tailored to clinical status and included paracetamol, antibiotics

and oxygen therapy as needed. Patients were followed with daily telephone calls and further risk stratification was based on: (1) need for oxygen therapy; (2) moderate effort dyspnoea; and (3) temperature >38.5°, not responsive to paracetamol. Overall, only 20 of the 115 patients (17.4%) were readmitted to the emergency department, and 15 (13%) were later moved to the ICU. Two of the 115 (1.7%) patients died. Thus, the vast majority (82.6%) of patients who were initially discharged did not require further treatment in hospital. These data, obtained in the largest series of patients outside China admitted to a single hospital available to date, strongly suggest the possibility to identify a subset of patients admitted to the emergency room who can be quickly discharged and efficiently followed up at home with a low risk of readmission and an overall positive outcome (98.3% survival and 1.7% mortality), while the overall mortality rate in Italy in these patients was 9% at that time.

	Number of patients
Admitted to emergency department	612
Admitted with acute flu or respiratory symptoms	443
Initial diagnosis of COVID-19	397
Discharged based on decision tree	115
Did not require additional treatment	95
Readmitted following home discharge	20
Transferred to intensive care	15
Died for COVID-19 infection	2

The devastating impact of the COVID-19 epidemic on hospital emergency services in the area of Bergamo obliged physicians to implement a decision tree in order to optimize the management of patients and guarantee that cases with less critical disease receive optimal treatment outside the hospital with limited mortality. The strategy described made it possible to provide adequate assistance in the emergency department to patients with the most severe respiratory disease.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

DOI: 10.1097/MEJ.0000000000000720