

Comparison between hospitalized patients affected or not by COVID-19 (RESILIENCY study)

Alessandro Russo¹, Valeria Bellelli¹, Giancarlo Ceccarelli², Federica Marincola Cattaneo¹, Luigi Bianchi¹, Roberto Pierro¹, Roberta Russo¹, Alessia Steffanina¹, Francesco Pugliese³, Claudio Maria Mastroianni², Gabriella d'Ettore², Francesco Sabetta¹

¹ Internal Medicine Unit, Policlinico Casilino, Rome, Italy

² Department of Public Health and Infectious Diseases, "Sapienza" University of Rome, Rome, Italy

³ Department of Anesthesia and Intensive Care Medicine, Sapienza University of Rome, Rome, Italy.

Corresponding author:

Alessandro Russo, M.D.

Internal Medicine Unit, Policlinico Casilino

Via Casilina, 1049, 00169 Rome, Italy

Email: alessandro.russo1982@gmail.com

Dear Editor,

in the recent report of Munblit and coworkers [1], authors observed that the combination of clinical features was sufficient to diagnose COVID-19 indicating that laboratory testing is not critical in real-life clinical practice. To date, all patients admitted to Emergency Department with acute respiratory failure and/or fever should be considered as a suspected SARS-CoV-2 infection [2-3], and an early recognition of etiology and the prompt therapeutic management are crucial to improve survival [4-5].

From March to July 2020, we performed a prospective, multicenter study (RESILIENCY study). During the study period, all patients hospitalized for suspected or confirmed COVID-19 were prospectively recruited in 3 large hospitals in Rome, Italy. All patients with suspected SARS-CoV-2 infection, admitted to the hospital in case of fever and/or hypoxemic respiratory failure ($\text{PaO}_2 < 60$ mmHg at rest in ambient air) or of exacerbation of underlying diseases or severe symptoms not manageable outside the hospital, were evaluated according to a predefined protocol (see **Figure 1**).

Overall, 653 patients were included in the study: 309 (47.3%) patients with confirmed COVID-19 and 344 (52.7%) without COVID-19, hospitalized for other causes. Baseline characteristics and outcomes of the study population showed that the main causes of hospitalization among patients without COVID-19 were: acute heart failure (47%), bacterial pneumonia (38.5%), and pulmonary embolism (9.2%). Overall, 67 (21.7%) patients of COVID-19 group and 45 (13.1%) hospitalized for other causes were admitted to intensive care unit; 30-day mortality was observed in 59 (19%) patients of COVID-19 group and 62 (18%) of non-COVID-19 group.

The multivariate analysis about risk factors for COVID-19 etiology at time of hospitalization showed that dry cough (OR 3.76, CI 95% 1.98-7.92, $P < 0.001$), duration of fever > 3 days (OR 5.21, CI 95% 2.34-9.21, $P < 0.001$), lymphocytopenia (OR 1.98, CI 95%

1.27-4.22, $P=0.002$) and $\text{PaO}_2/\text{FiO}_2$ ratio <250 (OR 4.98, CI 95% 2.22-9.71, $P<0.001$) were independently associated with COVID-19 etiology, while procalcitonin value >1 ng/ mL (OR 0.21, CI 95% 0.08-0.82, $p<0.001$), and lactate >2 mmol/L (OR 0.41, CI 95% 0.15-0.77, $p<0.001$) were associated with non-COVID-19 etiology.

Finally, analysis about predictors of 30-day mortality showed that age (per-year increase OR 1.33; CI 95% 1.11-2.10; $p<0.001$), cardiovascular disease (OR 4.58; CI 95% 2.07-8.25; $p<0.001$), and ICU admission (OR 2.1; CI 95% 1.48-4.4; $p<0.001$) were independently associated with all-cause 30-day mortality, while the use of low-molecular-weight heparin (OR 0.22, CI 95% 0.03-0.45, $p=0.002$) was associated with survival.

The findings of the present study can be summarized as follows: 1) the prompt identification of specific clinical characteristics (like dry cough or duration of fever >3 days), and laboratory findings (like lymphocytopenia, $\text{PaO}_2/\text{FiO}_2$ ratio <250 , procalcitonin value >1 ng/ mL, and lactate >2 mmol/L) can help physicians to distinguish rapidly between COVID-19 or other etiologies [6]; 2) the application of a standard approach to management of patients with acute respiratory failure and/or fever associated with the knowledge of clinical and laboratory characteristics of COVID-19 can early drive physicians to therapeutic choices; and 3) age, cardiovascular disease, and ICU admission show an independent association with all-cause 30-day mortality [7], while the use of low-molecular-weight heparin was associated with survival [8].

In conclusion, COVID-19 syndrome is characterized by a heterogeneous clinical, laboratoristic, and radiological presentation, especially at its onset [9]. However, the application of a standard approach to management of patients with acute respiratory failure and/or fever and the knowledge of clinical and laboratory characteristics of COVID-19 can early drive therapeutic choices [10].

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Figure 1. Management of suspected COVID-19 at time of admission in Emergency Department

Legend. CT: computed tomography; PCT: procalcitonin; CRP: C-reactive protein; LDH: lactate dehydrogenase; CPK: creatine phosphokinase.

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Figure 1

