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A diagnostic model to predict sars-cov-2 positivity in emergency department using routine admission hematological parameters

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Abstract

Early detection of SARS-CoV-2 in the emergency department (ED) is a crucial necessity, especially in settings of overcrowding: establishing a pre-diagnostic test probability of infection would help to triage patients and reduce diagnostic errors, and it could be useful in resource limited countries. Here, we established and validated a clinical predictor of infection based on routine admission hematological parameters. The diagnostic model was developed by comparing 85 consecutive patients with symptomatic COVID-19 confirmed by RT-PCR with 85 symptomatic, SARS-CoV-2-negative controls. Abnormal hematological parameters significantly ($p < 0.05$) associated with SARS-CoV-2 infection were used to derive a "cumulative score" between 0 and 16. The model was validated in an independent cohort of 170 SARS-CoV-2-positive patients. Several routine hematology parameters were significantly ($p < 0.05$) associated with SARS-CoV-2 infection. A "cumulative score" score ≥ 7 discriminated COVID-19-postive patients from controls with a sensitivity of 94% and specificity of 100% ($p < 0.001$). The high sensitivity of the predictive model was confirmed in the prospective validation set, and the cumulative score (i) predicted SARS-CoV-2 positivity even when the first oro-nasopharyngeal swab RT-PCR result was reported as a false negative in both cohorts and (ii) resulted to be independent from disease severity. The cumulative score based on routine blood parameters can be used to predict an early and accurate diagnosis of SARS-CoV-2 infection in symptomatic patients, thereby facilitating triage and optimizing early management and isolation from the COVID-19 free population, particularly useful in overcrowding situations and in resource-poor settings.

Biography

Rossana Soloperto has completed her study in Medicine from Perugia's University (Italy), currently she is a full Emergency Physician working in ED and Subintensive COVID-19 Unit in San Pio Hospital in Benevento, she's completing her Residency Program in Emergency Medicine at Federico II University Hospital in Neaples. She is Guest Editor of a Special Issue published in the international journal Diagnostics, and she's attending a I level Master in Padua's University in Biostatistics and Scientific Research Publication. She has several papers published in reputed international journals and is a member of the main Emergency Medicine and Intensive Medicine's Societies.

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