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SARS-CoV-2 and electrocardiography: is electrocardiography a predictor of mortality?— Authors' reply

We appreciate the interest of Babayiğit *et al.* in our study assessing the relation of the electrocardiogram (ECG) with clinical outcome in patients with SARS-CoV-2 infection.¹ They make some critical observations to our article, concluding that the reported association of ECG abnormalities with mortality in these patients is in fact doubtful.² It seems, however, that Babayiğit *et al.* failed to catch the substance of our study. As already detectable from the title, we aimed to assess whether the presence of abnormal findings at the ECG recorded at presentation in the emergency room (ER) identified patients with increased risk of a negative outcome, independently of their causes. According to the results, the key message of our study is that SARS-CoV-2 infected patients showing abnormal ECG findings at presentation should prompt particular attention due to their increased risk of adverse outcome.¹ Certainly, the causes of ECG abnormalities are heterogeneous in these patients and the attending physicians should obviously identify them and, if correctable, implement adequate interventions. However, this is a different problem and how it would impact on the outcome was beyond the scope of our article and would require a much larger population of patients.

As far as the specific points raised by Babayiğit *et al.*, their concern that ECG in our patients might

have been influenced by 'anti-SARS-Cov-2' drugs, such as hydroxychloroquine or azithromycin, is unjustified. As clearly described in the Methods, indeed, in our patients, the diagnosis of SARS-CoV-2 infection was done on admission in the ER¹; thus, there could not be any patient treated with any of 'anti-SARS-Cov-2' drugs in our study.

While none of our patients was found to have electrolyte abnormalities able to significantly influence the ECG, the presence of ECG abnormalities related to an underlying heart disease or cardiological drugs is, in fact, among the reasons why the ECG may portend an ominous prognosis and, therefore, it is wrong to consider this a limitation of our study.

We instead agree with Babayiğit *et al.* that the strong relation between left bundle branch block and mortality found in our study needs confirmation in larger populations due to the low number of patients ($n=6$) that showed this conduction disorder in our study, as we clearly stated in the Discussion.¹

We also agree that echocardiographic examination might have been helpful in assessing our patients. However, again, our aim was to investigate whether ECG at presentation added prognostic information to the clinical data available at that time. Echocardiography cannot always be rapidly performed in patients admitted to a crowded ER; moreover, international recommendations claimed against routine echocardiography in SARS-CoV-2 patients to avoid unnecessary risk for the operator.^{3,4}

Finally, Babayiğit *et al.* seem to claim that we should have assessed cardiac death as the major endpoint of the study. We believe, instead, that the negative influence on clinical outcome of pre-existing cardiac disease and infection-related cardiac involvement, as suggested by ECG abnormalities, goes beyond the mere occurrence of cardiac

events, as these conditions may also adversely affect clinical outcome of patients with other critical diseases, as the typical respiratory distress syndrome of SARS-CoV-2 infection.

In conclusion, while confirmation of our data in larger populations is desirable, none of the Babayiğit *et al.* criticisms may put into question our observation that the simple standard ECG, easily obtainable on admission, can be helpful to identify patients at increased risk of worse short-term clinical outcome among those admitted to ER for a SARS-CoV-2 infection.

Conflict of interest: none declared.

References

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