


## Comment on “Prognostic value of T-wave positivity in lead aVR in COVID-19 pneumonia”

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Dear Editor,

The study<sup>1</sup> entitled “Prognostic value of T-wave positivity in lead aVR in COVID-19 pneumonia” investigated the relationship between T-wave positivity in lead aVR and the prognosis of patients with COVID-19 pneumonia. The findings suggest that T-wave positivity in lead aVR is a useful predictor of poor prognosis in COVID-19 patients. While the findings of this study are interesting, I would like to point out some potential limitations.

First, the sample size of this study<sup>1</sup> is relatively small, which limits the generalizability of the findings. The study<sup>1</sup> included only 130 patients (75 in the deceased group and 55 in the living group), which may not be representative of the larger population of COVID-19 patients. Moreover, the lack of a control group of patients without COVID-19 makes it difficult to determine if the observed changes in T-wave positivity are specific to COVID-19 or if they are a result of other factors. For instance, a study<sup>2</sup> involving 6,354 participants found that the prevalence of a positive T wave in lead aVR (aVRT+) was 2.2%, suggesting that aVRT+ can be found in the general population and that aVRT+ is not a unique factor in COVID-19 patients. In addition, another nationwide population study<sup>3</sup> showed that aVRT+ is also related to the prognosis of hypertensive patients. As described in Table 1, 70% of the participants in this study had hypertension. In this case, the occurrence of aVRT+ may be caused by other confounding factors, not by COVID-19 itself. Therefore, it is necessary to set up a control group without COVID-19 to balance other confounding factors.

Second, this study did not account for the potential effects of medications on T-wave positivity in lead aVR. It is well-known that many medications can cause changes in the electrocardiogram (ECG) and lead to T-wave abnormalities. For example, medications such as hydroxychloroquine and chloroquine<sup>4</sup> have been reported to cause T-wave changes in the ECG. Additionally, the medications that the patients were taking may have influenced the results. It is possible that the observed changes in T-wave positivity were due to medication use rather than COVID-19 pneumonia. Therefore, it is important to consider medication use as a potential confounding variable in the analysis of T-wave positivity in lead aVR.

Third, COVID-19 is a complex disease that can manifest in a wide range of clinical presentations, from mild symptoms to severe respiratory failure<sup>5</sup>. It is important to consider the severity of the disease when interpreting prognostic markers, as the risk of adverse outcomes, such as death, may be related to the severity of the disease. This study suggests that T-wave positivity in lead aVR may be a useful prognostic marker for COVID-19 pneumonia, but it does not provide a clear definition of disease severity. It is possible that the observed changes in T-wave positivity are related to the severity of COVID-19 and not necessarily to COVID-19 pneumonia itself. Furthermore, the deaths were more likely to occur in patients with severe COVID-19, while the surviving patients were more likely to have mild COVID-19. Therefore, the severity of COVID-19 should be considered a prognostic factor for death, but not aVRT+. It is necessary to describe the severity of COVID-19, thereby reducing the influence of confounding factors.

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