



In reply to: IL-6 serum level and olfactory dysfunction severity in COVID-19: correspondence

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The choice of the statistical test for the study of correlations between variables that is burdened by the lowest rate of bias has always been at the centre of a heated debate among biostatisticians. The Spearman's correlation coefficient, as in our study, can be used in the case of nonnormally distributed continuous data, for data with relevant outliers or for ordinal data [2, 3] which is why this statistical test is routinely used in clinical studies with these types of variables. Considering the olfactory psychophysical scores as an ordinal variable, we do not therefore believe that it was incorrect to use the Spearman correlation coefficient. Moreover, the way in which ordinal variables are treated is debated and some authors suggest that they can almost always be considered as continuous variables [4]. A type II statistical error can be introduced by the size of our sample (74 cases) and that is why the study was indicated as “preliminary” and this was disclosed in the limitations, although the Spearman's test

is indicated in the case of small samples [2, 3]. The results of the correlation analysis are confirmed by the analysis of the interleukin-6 (IL-6) median concentration differences between clinical groups of olfactory function, determined on the basis of the olfactory scores (Kruskal–Wallis test $p=0.369$). Moreover, no significant differences were found at the intergroup post hoc analysis with the Mann–Whitney U test.

For all these reasons, we believe that the results of the statistical analysis are to be considered reliable and that, at least as regards the small sample reported in our study, a correlation between the levels of IL-6 and the severity of olfactory dysfunction (OD) cannot be demonstrated. Finally, we agree with our colleagues that systemic IL-6 can be associated with countless confounding factors, but without doubt this marker has an important prognostic value in coronavirus disease 2019. It will be interesting to study the correlations between OD and nasal inflammatory and immunological factors to reduce confounding factors and because OD is probably mostly due to local rather than systemic factors [5].

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Declarations

Conflict of interest None of the authors has a financial interest in any of the products, devices or drugs mentioned in this manuscript.

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