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Letter to the Editor

## **The Outcome of Solid Organ Transplant Recipients with COVID-19 Depends not only on a few but on a Large Number of Influencing Factors**

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We were interested to read the article by Lim *et al.* on a retrospective study of the differences in the outcome of severe SARS-CoV-2 infection (SC2I) between solid organ transplant recipients (SOTRs) and non-SOTRs using propensity score matching analysis and multivariate logistic regression analysis [1]. Of the 7327 SC2I patients, the 83 SOTRs had a higher risk of high-flow nasal cannula use, renal failure, mechanical ventilation, and composite severity of SC2I than non-SOTRs [1]. The National Early Warning Score (NEWS) was higher in SOTRs than in non-SOTRs, and male gender was associated with a worse outcome, while a 2-3-fold dose of vaccine was associated with a better outcome [1]. The study is excellent, but some points should be discussed.

The first point is that the current medication was not included in the analysis. Since SOTRs usually have to take medication regularly, it would be interesting to know to what extent the type and number of medications influenced the SC2I result in both groups. In particular, the type, dosage and number of immunosuppressive drugs that SOTRs have to take regularly should be included in the analysis.

The second point is that the type of transplanted organ was not included in the analysis. Since the outcome of SC2I can differ greatly between those who received a skin transplant, for example, and those who received a lung or a lung plus heart, it would have been interesting to analyze the outcome with regard to the type of transplanted organ. In particular, it is conceivable that patients who received a lung may have a worse outcome than patients who received a finger.

The third point is that the time since transplantation was not included in the analysis. Since it is conceivable that those who have had the transplant for longer have a worse result than those who have only recently had it, it would have been imperative to include the latency period between transplantation and the time of analysis in the evaluation.

The fourth point is that the severity of COVID-19 was not included in the analysis. As patients requiring mechanical ventilation may have a worse outcome than patients receiving only continuous positive airway pressure (CPAP) or an oxygen mask, it would have been imperative to differentiate between these two groups when analyzing the data.

The fifth point is the retrospective design of the study [1]. Retrospective designs have the disadvantage that some data may be missing, the accuracy of the data cannot be easily verified, desired missing or new data can no longer be generated and the indication for certain examinations is often not comprehensible. A retrospective design also does not allow for follow-up studies. We should know how many patients had to be excluded due to missing data, how many were included despite missing data and to what extent this influenced the results.

In summary, it can be said that this interesting study has limitations that relativize the results and their interpretation. Addressing these limitations could strengthen the conclusions and support the message of the study. The outcome of SOTRs with COVID-19 may depend not only on a few, but on a plethora of influencing factors.

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**Consent for publication:** Not applicable.

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#### References

1. Lim JH, Nam E, Seo YJ, Jung HY, Choi JY, Cho JH, *et al.* Clinical Outcomes of Solid Organ Transplant Recipients Hospitalized with COVID-19: A Propensity Score-Matched Cohort Study. *Infect Chemother*, May 14, 2024. Doi: 10.3947/ic.2024.0027