Two Doses of SARS-CoV-2 Vaccines Reduce Risk of Death Due to COVID-19 in Solid Organ Transplant Recipients: Preliminary Outcomes From a UK Registry Linkage Analysis

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Solid organ and islet transplant (SOT) recipients have higher risk of death following severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection.[1,2] Trials investigating SARS-CoV-2 vaccine efficacy excluded SOT recipients.[3] As seen with other vaccines, immunosuppression may reduce SARS-CoV-2 vaccine efficacy. Emerging data indicate lower spike protein antibody levels following vaccination in SOT recipients.[4]

Registry linkage studies enable prospective tracking of new SARS-CoV-2 infections in vaccinated and unvaccinated SOT recipients. The UK transplant registry (held by NHS Blood and Transplant) records all SOT recipients, Public Health England records positive results for SARS-CoV-2 RNA in England, NHS Digital holds records of date of death, and the National Immunisation Management Service records details of all doses of SARS-CoV-2 vaccines administered in England. Linkage of these 4 registries enables analyses of outcomes of interest: demographics of vaccine uptake, testing positive for SARS-CoV-2 RNA 14 d after first or second vaccine dose, and death within 28 d of testing positive.

In the United Kingdom, SARS-CoV-2 vaccination roll out commenced on December 8, 2020, with a predefined prioritization.[5] Pfizer (BNT162b2) and Oxford/AstraZeneca (ChAdOx1-S) were the predominant vaccine types deployed, and most SOT recipients received their first dose in February 2021 and the second dose approximately 10 wk later. Following linkage of the 4 registries, SOT recipients from England (n = 48 213) who were alive with a functioning graft on September 1, 2020, were followed up for outcomes of interest.

As of July 9, 2021, 82% (n = 39 727) had received both vaccine doses, 4% (1738) had received 1 dose, and 14% (6748) remained unvaccinated or contracted infection before vaccination. Vaccination uptake was lower in London (75%) and in people from Black, Asian, and mixed race and minority ethnic backgrounds (65%–75%). Table 1 shows the unadjusted case fatality ratios in vaccinated cases compared with unvaccinated cases. The mortality rate after testing positive for SARS-CoV-2 was 7.7% among recipients of 2 doses compared with approximately 12% among unvaccinated patients and recipients of only 1 dose.

This study is the first published national registry–based analysis reporting on real-world vaccine efficacy in the SOT patient population and has the strengths of scale and minimal ascertainment bias. Case fatality ratio comparison methodology was used to reduce risk of bias when only mortality is reported as outcome of interest; detailed risk-adjusted analyses are currently being undertaken to evaluate risk of SARS-CoV-2 infection and related mortality in vaccinated versus unvaccinated patients and will be published in due course. The findings need to be interpreted in the context of changes in virus circulation in the community; Alpha and Delta variant surges in the United Kingdom; and the implementation, adherence to, and subsequent relaxation of government-mandated nonpharmaceutical interventions. Despite these limitations, there appears to be an early indication that vaccinated SOT recipients have a reduced risk of death from COVID-19 compared with unvaccinated SOT recipients.

We believe this information will provide some assurance to vaccinated patients and help clinical teams target interventions to encourage currently unvaccinated patients

TABLE 1.

Case fatality ratios for deaths within 28 d of onset in vaccinated compared with unvaccinated transplant recipients

Vaccination status (n)	SARS-CoV-2 RNA positive, n	Deaths in SARS-CoV-2 RNA-positive patients	
		N	(%)
Unvaccinated (6748)	3473	438	12.6
One dose (1738)	326	39	12.0
Two doses (39 727)	143	11	7.7

SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

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to take up the offer of both vaccine doses at the earliest opportunity.

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