COVID-19 incidence was initially associated with posttransplant graft failure rates

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Introduction

The emergence of COVID-19 severely disrupted the transplant system. Using donor kidney transplant was essentially halted, and waitlist mortality rates for kidney candidates increased. To better understand the effect of COVID-19 on kidney posttransplant outcomes, we estimated the association of county-level COVID-19 incidence with kidney posttransplant all-cause graft failure.

Methods

Study population
The study used a period-prevalent cohort of kidney recipients from March 13, 2019 to July 31, 2020, who received a transplant on or after January 1, 2020. Specifically, recipients were included if (1) transplanted on or after January 1, 2020, (2) transplanted on or before July 31, 2020, and (3) had graft function on March 13, 2019.

COVID-19 incidence
The county-level incidence of COVID-19 for each kidney transplant program was determined from the New York Times database and aggregated into cases per 1,000,000 for each week before and after the national emergency declaration for COVID-19.

For each week, recipients were given the county-level incidence of the transplant program during the previous week. For example, the association of COVID-19 incidence was particularly strong in mid-April but significantly attenuated by the end of May. Thus, the emergence of COVID-19 coincided with a significantly higher rate of kidney graft failure, potentially from COVID-19 infection or patients not seeking for-cause medical care. However, after the initial disruption, COVID-19 incidence had a weaker association with kidney graft failure rates.

The association may have attenuated because (1) kidney recipients and transplant programs adapted to the new conditions imposed by COVID-19 and/or (2) the availability of COVID-19 testing was different and the implied severity of, for example, an incidence of 64 cases per 1,000,000 was worse in March than May 2020.

The observed effect of COVID-19 incidence aligns with previous research into kidney waitlist mortality immediately following COVID-19. Specifically, the hazard of waitlist mortality was significantly elevated during the two months immediately after the emergence of COVID-19 before a notable attenuation. Because kidney candidates and recipients have different interactions with the medical system, the alignment early in the pandemic may represent an effect of community transmission on outcomes.

Discussion

The association of COVID-19 incidence was particularly strong in mid-April but significantly attenuated by the end of May. Thus, the emergence of COVID-19 coincided with a significantly higher rate of kidney graft failure, potentially from COVID-19 infection or patients not seeking for-cause medical care. However, after the initial disruption, COVID-19 incidence had a weaker association with kidney graft failure rates.

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References

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