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EDITORIAL

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Early data on SARS-CoV-2 infection in paediatric kidney transplantation

The ongoing COVID-19 global pandemic has provided challenges in the management of pKTR internationally and remains of concern in 2022. The effects of SARS-CoV-2 infection on immunocompromised patients can be severe, especially in adults with pre-existing medical conditions such as hypertension, diabetes mellitus and cardiovascular or respiratory disease.[1] This is pertinent for solid organ transplant recipients who are on maintenance immunosuppression to prevent organ rejection and often have associated comorbidities. Studies have shown that adult kidney transplant recipients are at higher risk for severe COVID-19 infection with higher mortality rates.[2]

However, there are limited data in pKTR and consequently, during the first wave of COVID-19 infections, many paediatric transplantation programmes reduced the number of deceased donor transplants and stopped their living donor transplantation programmes. Reassuringly, evidence shows that CYP generally have a milder clinical course of COVID-19 with favourable outcomes and low mortality rates.[3] Furthermore, solid organ transplantation in CYP does not incur an increased risk of severe COVID-19 infection.

The epicentre for the COVID-19 pandemic during the first wave in Europe in early 2020 was in Italy. In this publication of *Pediatric Transplantation*, Cazzaniga et al investigated the incidence and clinical course of SARS-CoV-2 infection in pKTR, aged 2–21 years, in a single centre in Northern Italy through a retrospective, observational study over 14 months.[4]

In all, 101 patients were eligible for the study, of which 57 (56%) underwent at least one nasopharyngeal swab RT-PCR test to detect SARS-CoV-2 infection, due to epidemiological or clinical criteria: presence of symptoms suggestive of COVID-19 infection, contact tracing, positive serological rapid test or screening at hospitalisation. In total, 12 of these 57 (21%) patients tested positive for COVID-19 infection. All patients were on immunosuppressive therapy, with the majority (91.2%) taking a regimen of tacrolimus, prednisolone and anti-proliferative agent (azathioprine or mycophenolate mofetil). There were similar clinical and demographic characteristics between those that tested positive and those that tested negative, with a median age of 15 years and a similar time from kidney transplantation.

The authors have shown the incidence of COVID-19 infection in this cohort (21%) is higher than in the general Italian paediatric population (3.6%).[5] However, this figure is difficult to interpret as only patients at risk of COVID-19 infection were tested and there may have been unreported positive cases that were untested because they were asymptomatic. Nonetheless, the finding of a relatively high seroprevalence of COVID-19 infection in paediatric transplant patients appears to be a reproducible one, with US study by Varnell et al showing an incidence of 8.5%.[6]

Reassuringly, the authors also describe a mild clinical course of COVID-19 infection in pKTR. Of the 12 patients who tested positive for COVID-19 infection, eight (67%) developed mild symptoms, and none with acute kidney injury. This benign course in pKTR was also seen in patients with comorbidities that are known independent risk factors for severe COVID-19 infection, such as hypertension, diabetes mellitus and obesity.

We are confident that these data are of great interest to our readers and all those involved in the care of paediatric solid organ transplant recipients. There is limited published research relating to the clinical outcome of COVID-19 infection in the paediatric transplant population. This study has importantly demonstrated that despite relatively high seroprevalence of SARS-CoV-2, the benign clinical outcome of SARS-CoV-2 infection in pKTR mirrors that in the general paediatric population. This study confirms the previous literature that shows that children receiving immunosuppressive therapy appear to have a mild clinical course of COVID-19 infection.[7] Determining the true incidence of COVID-19 infection was limited by the small number of participants in this single-centre, observational study.

By observing that the median duration of RT-PCR positivity was 17 days in this cohort, compared with 20 days in immunocompetent patients,[8] and the similar time from kidney transplantation in those that tested positive with those that tested negative, the authors comment that neither immunosuppression nor immunosuppressive 'load' influences viral clearance. This provides important data to guide immunosuppressive drug treatment regimen plans during COVID-19 infection.

Importantly, this study provides supporting evidence in favour of keeping paediatric transplant programmes active during further waves of COVID-19 infection, and that there does not appear to be a need for anticipatory hospitalisation in this group of patients. This study adds to the limited data available to determine who is at risk of severe disease to guide practice in relation to outpatient therapies.[9] By showing the contrasting effects of COVID-19 infection between the paediatric and adult solid organ transplant populations, the study highlights the need for further research looking at CYP

Abbreviations: COVID-19, Coronavirus disease 2019; CYP, children and young people; pKTR, paediatric kidney transplant recipients; SARS-CoV-2, severe acute respiratory syndrome coronavirus-2.

specifically rather than continuing to base pivotal decisions relating to the paediatric transplant population on data derived from their adult counterparts.

AUTHOR CONTRIBUTIONS

The first draft of the manuscript was written by Rishil Patel and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST

The authors declare they have no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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