# COVID-19 in children treated with immunosuppressive medication for kidney diseases

## Supplementary Data: Severity of Infection Grade

| | |
|---|---|
| Infection severity grade within this study | 45 children not admitted to hospital (Grade 1)<br><br>43 children admitted to hospital with no respiratory support (Grade 2)<br><br>14 children admitted to hospital and required supplemental oxygen (Grade 3)<br><br>5 children admitted to hospital and required high-flow nasal cannula oxygen or BiPAP (Grade 4)<br><br>6 children admitted to intensive care or death (Grade 5) |

Figure: Distribution of COVID-19 severity by kidney disease and immunosuppressive treatment (number of oral medications, or biologics).

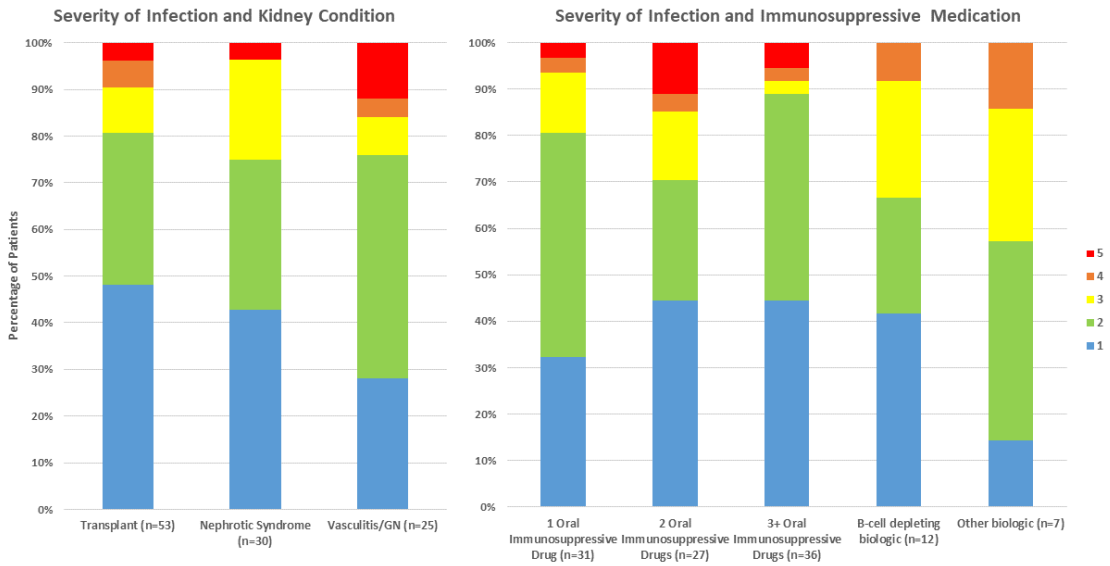


Figure Footnotes: Severity of Infection Grade: 1 - Not admitted to hospital, 2 – admitted to hospital with no respiratory support, 3 – admitted to hospital and required supplemental oxygen, 4 – admitted to hospital and required high-flow nasal cannula oxygen or BiPAP, 5 – admitted to intensive care or death. Abbreviations: GN – glomerulonephritis.

The Figure above shows the distribution of disease severity across the 113 children based on immunosuppressive medication "load" with the population split into those on 1, 2 and 3 or more oral immunosuppressive agents, with those on biologics separately analysed. There were no significant differences in infection severity grade across these five groups ($p$=0.54). The mean (±SD) infection severity grade was 2.1±1.2 in those taking steroids (n=86), 1.9±1.2 in those taking Tacrolimus/CsA (n=66), 1.9±1.2 in those taking MMF or Azathioprine (n=70) and 2±1.6 in those taking mammalian target of rapamycin (mTOR) inhibitors (n=8). There was no significant difference across the groups ($p$=0.72).

In 44 children (39%) immunosuppression was reduced due to the COVID-19. The mean (±SD) severity of infection grade was 2.4±1.2 in those where immunosuppression was modified and 1.7±0.9 in those where it was not ($p$=0.001).

Nineteen children received specific therapies for COVID-19: 10 had hydroxychloroquine, 4 had azithromycin, 2 oseltamivir, 1 remdesivir, 1 favipiravir and 1 ritonavir/lopinavir. The mean severity of infection grade was 2.6±1.4 in those who received specific therapies for COVID-19 and 1.9±1 in those who did not ($p$=0.033).

There was no significant difference in the severity of COVID-19 in children who had PCR or antibody confirmation of COVID-19 (severity of infection grade 2.0±1.1) compared to those where COVID-19 was clinically highly suspected without laboratory confirmation at the time of reporting (severity of infection grade 2.1±1.3, $p$=0.76).

**Supplementary Data: Children with a Severe Disease Course**

There were six children with a severe disease course in this study. Two adolescents from Europe, one with a kidney transplant and one with CKD stage IV, requiring ventilation and both have recovered. One death was in an adolescent from South America with a kidney transplant and insulin dependent diabetes mellitus who had bacterial sepsis and positive blood cultures requiring mechanical ventilation and died from multi-organ failure. Three deaths were from India; one died before they were able to reach intensive care and two had cardiac arrests soon after arriving to the tertiary centre, where they arrived in shock after long journeys from their local health units and both children had co-morbidities including one being on maintenance haemodialysis.