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## Educational Article

# COVID-19 and research in pediatric urology



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Covid-19; Research; Pediatric urology

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## Summary

COVID-19 began in December 2019 then spread worldwide. Providers, including pediatric urologists, had to adapt their clinical processes, and many non-covid research activities were suspended. COVID-19

impacts how research is financed, performed, and published, and is itself the subject of intense research. We present current research and publications specifically related to the urinary tract and the pediatric population.

Coronavirus disease 2019 (COVID-19) began in December 2019 then spread worldwide. Providers, including pediatric urologists, had to adapt their clinical processes, and many non-covid research activities were suspended [1,2]. COVID-19 impacts how research is financed, performed, and published, and is itself the subject of intense research.

However, little is known on how SARS-CoV-2 affects the urinary tract. We know that its spike protein's three-dimensional structure has a strong binding affinity to both the urinary bladder and the kidneys through ACE positive cells [3]. This may in part explain the acute kidney injuries (AKI) occurring in 0.1–29% of adult patients with COVID-19, though it may also be explained by an immune-mediated response [4]. A recent publication in European Urology reported seven adult males presenting with increased urinary frequency associated with COVID-19 [5], and a recent case series reported that 18% of men reported scrotal discomfort during their course of COVID-19 infection [6].

Children are also affected. Though initially thought to be spared from serious effects of COVID-19, this may not be accurate. There have been an increasing number of reports of multisystem inflammatory syndrome in children (MIS-C) and in May 2020, the Centers for Disease Control and Prevention released a public health advisory along with a case definition for MIS-C [7]. The clinical and laboratory features of MIS-C are similar to Kawasaki disease, though the disorder has distinct features [8]. Although there is early data that AKI develops in pediatric patients with acute COVID-

19 and MIS-C (up to 11.8% of children in a recent review) the associated clinical characteristics, and short- and long-term outcomes are not well characterized [9]. There might also be direct effects on the urinary tract: there have been anecdotal reports of orchitis-like testicular inflammation seen in MIS-C patients in the emergency room and a recent study on imaging findings in MIS-C found bladder wall thickening in 6% of cases [10]. A recent publication also described graft artery stenosis in seven pediatric patients following kidney transplant, five of whom tested positive to COVID-19, and in the remaining two the diseased donor blood presented positive serology to COVID-19 [11].

COVID-19 has also created an enormous mental health burden on children and adolescents, either by its direct effect or because of the unique combination of social isolation, economic recession, and school closures with remote learning further eroding an essential exposure to formative childhood social interactions [12]. It is important to speculate that these factors may affect clinical situations such as bladder bowel dysfunction remains to be seen.

In conclusion, it seems obvious that the urological community, including pediatric urologist, should be proactive in developing research questions to understand how COVID-19 impacts our patients, and be prepared for a potential downstream increased volume of both organic and functional kidney and urinary tract complications which might present in the coming years.

## References

- [1] Harper L, Kalfa N, Beckers GMA, Kaefer M, Nieuwhof-Leppink AJ, Fossum M, et al. The impact of COVID-19 on research. *J Pediatr Urol* 2020 Oct;16(5):715–6.
- [2] Lombardo AM, Andolfi C, Deshpande AP, Aizen JM, Dangle PP, Gundeti MS. Pediatric urology amidst SARS-CoV-2 pandemic: building the future with current knowledge. *J Pediatr Surg* 2021 Jan 16;S0022–3468(21). 00037-3.
- [3] Zou X, Chen K, Zou J, Han P, Hao J, Han Z. Single-cell RNA-seq data analysis on the receptor ACE2 expression reveals the potential risk of different human organs vulnerable to 2019-nCoV infection. *Front Med* 2020 Apr;14(2):185–92.
- [4] Naicker S, Yang CW, Hwang SJ, Liu BC, Chen JH, Jha V. The novel coronavirus 2019 epidemic and kidneys. *Kidney Int* 2020 May;97(5):824–8.
- [5] Mumm JN, Osterman A, Ruzicka M, Stihl C, Vilsmaier T, Munker D, et al. Urinary frequency as a possibly overlooked symptom in COVID-19 patients: does SARS-CoV-2 cause viral cystitis? *Eur Urol* 2020 Oct;78(4):624–8.
- [6] Pan F, Xiao X, Guo J, Song Y, Li H, Patel DP, et al. No evidence of SARS-CoV-2 in semen of males recovering from COVID-19. *Fertil Steril* 2020;113(6):1135–9.
- [7] Centers for Disease Control and Prevention Multisystem inflammatory syndrome in children (MIS-C) associated with coronavirus disease 2019 (COVID-19).
- [8] Jiang L, Tang K, Levin M, Irfan O, Morris SK, Wilson K, et al. COVID-19 and multisystem inflammatory syndrome in children and adolescents. *Lancet Infect Dis* 2020 Nov;20(11):e276–88.
- [9] Basalely A, Gurusinghe S, Schneider J, Shah SS, Siegel LB, Pollack G, et al. Acute kidney injury in pediatric patients hospitalized with acute COVID-19 and Multisystem Inflammatory Syndrome in Children associated with COVID-19. *Kidney Int* 2021 Mar 3;S0085–2538(21). 00268-4.
- [10] Blumfield E, Levin TL, Kurian J, Lee EY, Liszewski MC. Imaging findings in multisystem inflammatory syndrome in children (MIS-C) associated with coronavirus disease (COVID-19). *AJR Am J Roentgenol* 2021 Feb;216(2):507–17.
- [11] Berteloot L, Berthaud R, Temmam S, Lozach C, Zanelli E, Blanc T, et al. Arterial abnormalities identified in kidneys transplanted into children during the COVID-19 pandemic. *Am J Transplant* 2020 Dec 21. <https://doi.org/10.1111/ajt.16464>. Epub ahead of print. PMID: 33346946.
- [12] Golberstein E, Wen H, Miller BF. Coronavirus disease 2019 (COVID-19) and mental health for children and adolescents. *JAMA Pediatr* 2020;174(9):819–20.