Incidence and Cumulative Prevalence of SARS-CoV-2 (COVID-19) Infection in Asymptomatic Pediatric Patients

UNMC
UNIVERSITY OF NEBRASKA MEDICAL CENTER℠

M. Pollmiller, DDS, Sarah Lowman, DDS, MPH, H. Roberts, PhD

Introduction

- Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2, COVID-19) is a global concern[3]
- SARS-CoV-2 + kids may be asymptomatic but contagious[7]
- Children comprise ~20% of the U.S. population
- Dental transmission of COVID-19 may occur when performing an aerosol generating procedure (AGP) on an asymptomatic positive patient[6]
- Asymptomatic children may be attending school and other activities, contributing to community spread of COVID-19
- Pilot Program for Test-Based Screening with Omaha Public Schools
  - *Question:* Do test-based programs reduce COVID-19 risk in K-12 schools?
  - *Methods:* Weekly saliva PCR tests were completed at OPS schools among students and staff
  - Tests conducted in Nov. and Dec. of 2020 (n=2,885)
  - *Results:* 46 positive cases detected (22 students / 24 staff)
  - *Conclusion:* Weekly testing "increased case findings and the removal of opportunities for viral transmission"

Objectives

- Identify trends in COVID-19 test results among pediatric dental patients awaiting AGPs at an academic institution in the Midwestern United States
  - Included patients were aged 0-18 years old
  - PCR and rapid antigen tests were completed
- Describe monthly incidence among the pediatric population of dental patients in the context of local public health measures

Methods and Data Analysis

- The study received UNMC IRB approval (pro 0820-21-EP)
- COVID-19 testing was conducted by pediatric dental residents as part of clinical practice at the UNMC COD
- Results were communicated to patients, their guardians, and Nebraska DHHS
  - Patients with a negative result were scheduled for dental appointments
  - Positive test=treatment was postponed for 21 days from the test date and/or resolution of symptoms
    - We recommended that positive patients follow up with their PCP
    - Patients were not retested for 3 months after a positive test
  - Urgent dental needs were addressed, even for COVID + patients (OR with negative pressure)
- A review of 1,097 tests resulted between January 2020 and October 31, 2021 was conducted for UNMC College of Dentistry (Lincoln and Omaha clinic locations) patients aged 18 and under

Participants:

1,097 pediatric patients were tested

Test Results by Age

	Test Result	
	Positive (n=41)	Negative (n=1056)
Age	10.83 (SD=4.51)	10.91 (SD=4.00)
	Full sample average age=10.91 (4.02)	

Test Results by Gender

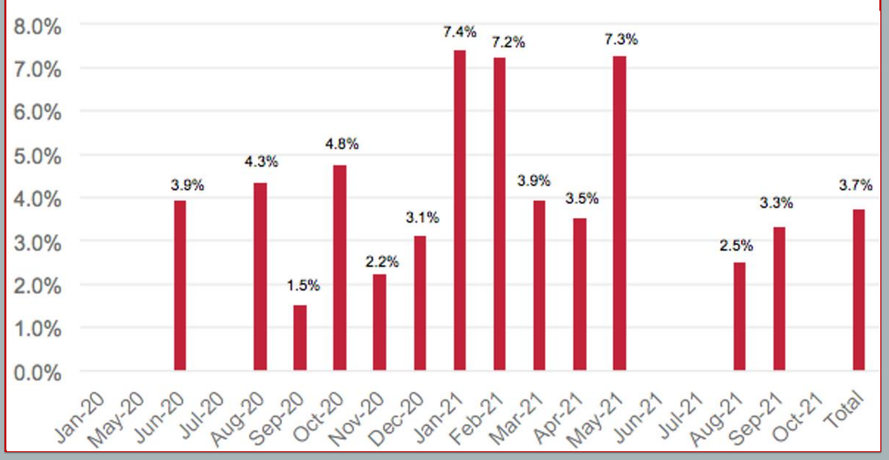
Gender (n)		Test Result (n)		Age on Date of Sample (mean)
Male	Female	Positive	Negative	
500	597	41	1056	10.91 (4.02)
				Age Range: 2-18

Independent samples t-test revealed no significant mean differences in test result by age, $t(1095) = .901$, $p>.05$

Gender	Test Result	
	Positive	Negative
Male	15 (3.0%)	485 (97.0%)
Female	26 (4.4%)	571 (95.6%)
Total	41 (3.7%)	1056 (96.3%)

Chi-square revealed no significant relationship between test result and gender, $\chi^2 (1)=.239$, $p>.05$

Monthly Incidence



Results and Discussion

- Overall prevalence rates of SARS-CoV-2, COVID-19 was 41 per 1,097 screened asymptomatic pediatric patients between January 1, 2020 to October 31, 2021.
- The average patient age (years) in the sample was 10.9; the average age of positive patients was 10.8. There was no significant relationship between test result and gender or age.
- Independent samples t-test revealed no significant mean differences in test result by age.
- Of the 1,097 COVID-19 tests completed on asymptomatic pediatric patients (54.4% female) during the study period, 41 (3.7%) of test results were positive and 1056 (96.3%) were negative.
- Among the patients who tested positive, 15 were male and 26 were female. Chi-Square revealed no significant relationship between test result and gender.
- Monthly incidence was calculated and January 2021, February 2021, and May 2021 had the highest monthly incidences of over 7%. Multiple months had 0% incidence, with no positive COVID-19 tests.

Conclusions

- The study quantifies incidence and cumulative prevalence of SARS-CoV-2, COVID-19 for asymptomatic pediatric patients prior to an aerosol generating procedure. The cumulative prevalence was 3.7% from January 2020 through October of 2021. All of the tests conducted were completed on screened asymptomatic pediatric patients and would likely have gone undetected without pre-treatment test.
- If safely able to postpone dental care, COVID-19 positive patients were rescheduled. This could possibly increase safety to staff and other patients.
- Asymptomatic COVID-19 testing in children removes infected children from school, who were not identified through conventional symptom detection or COVID-19 exposure. This information could help decrease possible transmission in schools by notifying parents of positive tests.
- The findings do suggest that prevention strategies are very important for pediatric patients as well. Prevention strategies include handwashing, COVID-19 vaccination, masking, and physical distancing.

Select References

3. Schwendicke F, Krois J, Gomez J. Impact of SARS-CoV2 (Covid-19) on dental practices: Economic analysis. J Dent. 2020 Aug;99:103387. doi: 10.1016/j.jdent.2020.103387. Epub 2020 May 27. PMID: 32473182; PMCID: PMC7255191.

6. Epstein JB, Chow K, Mathias R. Dental procedure aerosols and COVID-19. Lancet Infect Dis. 2021 Apr;21(4):e73. doi: 10.1016/S1473-3099(20)30636-8. Epub 2020 Aug 10. PMID: 32791041; PMCID: PMC7417139.

7. Lamberghini F, Trifan G, Testai FD. Severe acute respiratory syndrome coronavirus 2 infection in asymptomatic pediatric dental patients. J Am Dent Assoc. 2021 Apr;152(4):277-283. doi: 10.1016/j.adaj.2021.01.006. Epub 2021 Jan 19. PMID: 33641860; PMCID: PMC7816946.

9. "States' COVID-19 Public Health Emergency Declarations and Mask Requirements." *The National Academy for State Health Policy*, https://www.nashp.org/governors-prioritize-health-for-all/.

11. Crowe, J., Schnaubelt, A. T., Schmidt-Bonne, S., Angell, K., Bai, J., Eske, T., Nicklin, M., Pratt, C., White, B., Crotts-Hannibal, B., Staffend, N., Herrera, V., Cobb, J., Conner, J., Carstens, J., Tempero, J., Bouda, L., Ray, M., Lawler, J. V., … Broadhurst, M. J. (2021, January 1). Pilot program for test-based SARS-COV-2 screening and environmental monitoring in an Urban Public School District. medRxiv. Retrieved February 24, 2022, from https://www.medrxiv.org/content/10.1101/2021.04.14.21255036v1

University of Nebraska Medical Center