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In-Person Education During the Early COVID-19 Pandemic at Wichita Collegiate School

Emma Mantovani[1], Christopher Meyer, Jr.[1], Adam Sandid[1], Kerri Weeks, M.D.[2], Julian Dedeaux, Ph.D.[2], Maha Assi, M.D., MPH[3,4]
[1]Wichita Collegiate School, Wichita, KS
University of Kansas School of Medicine-Wichita, Wichita, KS
[2]Department of Pediatrics
[3]Department of Internal Medicine
[4]Infectious Disease Consultants, Wichita, KS

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ABSTRACT

Introduction. The COVID-19 pandemic forced most Kansas schools to adopt remote or hybrid learning in 2020-2021. Wichita Collegiate School proceeded with an in-person teaching model. The purpose of this study was to determine if in-person learning can be done safely during the COVID-19 pandemic prior to vaccine use.

Methods. Wichita Collegiate is a private school located in Sedgwick County, Kansas. The study population included 671 students (grades 1 - 12) and 130 staff. The procedures implemented during the school year (August 19, 2020 - May 21, 2021) included: mandatory face coverings, six feet physical distancing, and daily temperature checks. A registered nurse performed contact tracing and executed quarantine requirements per the U.S. Centers for Disease Control and Prevention guidelines.

Results. Over the study period, 487 students and staff were tested for COVID-19 and 18.5% (n = 90) were positive. Overall, students and staff rate of COVID-19 infection was lower than the expected rate when compared to the surrounding community of Sedgwick County. Thorough contract tracing of positive cases revealed that 2.2% (n = 2) individuals were likely exposed to COVID-19 at school.

Conclusions. This study suggested that transmission of COVID-19 was infrequent in a school setting with in-person attendance, even before widespread vaccine availability. By following public health guidelines and utilizing contact tracing, it was possible to limit the spread of COVID-19 during in-person learning. This has immediate implications for how schools safely returned to in-person learning in the post-vaccine era. ***Kans J Med 2022;15:202-204***

INTRODUCTION

Throughout the 2020-2021 school year, the COVID-19 pandemic challenged schools across Kansas to ensure the safety of students and staff, while providing the best possible education. With limited data to guide early decisions, most schools adopted remote or hybrid learning. Wichita Collegiate School (WCS) was one of the only schools in Kansas to proceed with a continuous in-person education model for all students throughout the entire school year. Collegiate, following U.S. Centers for Disease Control and Prevention (CDC) guidelines, implemented safety protocols such as: mandatory face coverings, daily temperature checks, and six feet physical distancing.[1]

It was hypothesized that implementing safety protocols based on CDC guidelines could protect the students and staff adequately during in-person education. In addition, cases of COVID-19 at WCS during the school year were predicted to not exceed the expected number of cases based on Sedgwick County rates during the same time frame. To determine the effectiveness of safety protocols and describe how in-person learning contributed to COVID-19 cases in the WCS community, data were collected to describe the frequency and transmission patterns of COVID-19 cases among the students and staff. Contact tracing provided useful data, more importantly, it curtailed the spread of the virus in the community.

The purpose of this study was to determine if in-person learning can be done safely during the COVID-19 pandemic in the pre-vaccine era.

METHODS

For this retrospective, single center study, COVID-19 data were collected from Wichita Collegiate School (WCS) students and staff during the in-person school year: August 19, 2020 - May 21, 2021. The holiday break when school was not in session (December 20, 2020 - January 6, 2021) was excluded.

WCS is a private Pre-K through 12th grade school located in Sedgwick County, Kansas. The school is organized by grade level and division. The study population included 671 students and 130 staff in grades 1 - 12, for a total of 801 people. Preschool and kindergarten students were excluded from our study because younger children were not required to wear face coverings, thus following a different set of safety protocols.

Sedgwick County is comprised of 523,824 residents according to the 2020 national census, making it the second-largest county in Kansas.[2] Sedgwick County contains 20 unified school districts. Moreover, WCS is located inside the Wichita metropolitan area, which is the most extensive metropolitan area in Kansas as it encompasses Sedgwick, Butler, Harvey, Kingman, and Sumner counties and has a population of over 600,000 people.

WCS implemented safety procedures in accordance with CDC recommendations. All students and staff were required to wear face coverings and maintain six feet physical distancing. Daily temperature checks were implemented upon arrival at school. Students and staff were instructed to contact the school registered nurse (RN) with any symptoms of COVID-19, possible exposures to COVID-19, or COVID-19 test results.[3]

The RN collected COVID-19 data, including classification of student or staff, date of illness presentation to the nurse, presence of symptoms or known exposure, source of exposure, and test results. Information was collected for the purposes of contract tracing. Data were kept in a Microsoft® Excel spreadsheet on a password protected computer. Data were collected prospectively, but analyzed at the conclusion of the school year. At that time, the database was de-identified by the nurse and provided to the research team for analysis. No protected health information was disclosed during the study.

Initially, all COVID-19 testing was conducted off campus. However, beginning November 2020, the RN provided on-site PCR testing at the request of the individual. Tests were sent to the Molecular Diagnostics Laboratory (MDL) at Wichita State University (WSU) for same day results. The RN also accepted test results from an outside lab or doctor's office.

The RN conducted thorough contract tracing of each reported positive case and executed quarantine protocol per CDC guidelines. Information on possible previous exposures for each positive case were collected and categorized as home, in school, school-related activities, community, or unknown.

This study described the number and distribution of positive cases within the WCS community, how cases presented, and the likely source of COVID-19 exposure discovered through contact tracing. Additionally, the rate of positive cases at WCS was compared to that of the surrounding community using data provided by the Sedgwick County Health Department.

Statistical analysis was done using SPSS (IBM® Statistical Analysis). Categorical variables were expressed as descriptive statistics, including frequencies, ranges, and percentages. A Chi-square was utilized to determine whether a statistical significance is present in observed relationships.

RESULTS

During the data collection period, a total 487 COVID-19 tests were undertaken by the study population. Ninety positive cases were identified for an overall positivity rate of 18.5%. Of note, 71 positive cases from 292 tests were identified during the first semester for a positivity rate of 24.3%. The second semester only accounted for 19 cases of 196 tests for a lower positivity rate of 9.7%. Of the 90 positive cases, 50 persons were tested because of possible exposure, while 40 were tested due to possible COVID-19 symptoms. Of the 90 positive cases, 17 (18.9%) were staff members and 73 (81.1%) were students. Staff were overrepresented compared to students, as they only comprised 16.2% of the study population.

Contact tracing found that only two (2.2%) positive COVID-19 cases traced back to in-person education. However, 17 (18.8%) positive cases were exposed during school-related activities, 29 (32.2%) inside their own home, and 11 (12.2%) were traced back to the community. The origins of 31 (34.4%) of the cases were unknown. Fortunately, no students or staff members were hospitalized or had serious health complications due to COVID-19 during the school year.

A Chi-square test of independence (χ^2) was calculated comparing rate of COVID-19 in WCS and Sedgwick County. A significant relationship was observed (χ^2 (1) =78.95; p = 0.016). Students and staff were less likely to test positive for COVID-19 when compared to the general population of Sedgwick County.[4] This might be explained by a different age group population, mostly children and teens at WCS. The rate of COVID-19 infections in children and teens was overall less than the rate in adults in the U.S. during the time frame of the study.

DISCUSSION

This study was a summary of real-life experience of in-school attendance during the early days of the COVID-19 pandemic. The most important finding was that our primary objective held true throughout the school year. The rate of COVID-19 transmission at WCS did not exceed the community rate of COVID-19 transmission in Sedgwick County over the same period. This was demonstrated further in Chicago during the same fall semester period corroborating that in-person education does not exceed community rates.[5]

Factors that made this possible were likely strict adherence to CDC guidance in regard to distancing, masking, testing, contact tracing, and quarantining.[6] A major investment was the allocation of a dedicated RN to apply and enforce those protocols. Without proper tracing the rate of transmission likely would have been higher and entire classrooms possibly would have had to quarantine rather than just close exposures. In addition, the free and readily available PCR test administered at school with a 24-hour turn around period made tracing more efficient. The creation of MDL at WSU with partial government funding was a turning point for the community regarding COVID-19 identification.

A challenge was the ever-changing nature of the national guidelines, but constant communication between the school board, the RN, and families helped with timely updates. Another salient factor was the willingness of the parents, school governance, and students to follow the guidelines, especially when inconvenient to them.

An area of concern was the number of cases traced back to school-related activities. The rate of COVID-19 was higher among students participating in sports compared to the general student body. Those groups were not able to mask and/or distance during sporting events. Therefore, their risks and exposures were different than the rest of the students. Again, showing that protocols in place had allowed in-person attendance and protected students to a certain degree while at school.[7]

It was important to remember that during the time of this study, a COVID-19 vaccine still was not widely available to the public. The Pfizer vaccine was made available to children ages 16 to 18 years of age in April 2021. The Pfizer and Moderna vaccines only had become available to adults (at least 18 years of age) in January and February of 2021. The decline in cases seen in the spring of 2020 was not yet the result of vaccination, but rather the overall enforcement of CDC guidance in the fall of 2020 in the community and at WCS. It was possible that the vaccines influenced rates in the latter part of the school year. It would be of value to analyze data again at the end of the 2022 school year, when that COVID-19 vaccines were widely available and approved for children 5 years and up. Of course, the rate of vaccination at school and in the community would need to be compared to understand any differences seen in rates of COVID-19 infection.

In the academic 2020-2021 school year, few schools adopted full-time, in-person learning. That decision had academic and psychological ramifications on students that possibly could have been avoided by adopting a model similar to the WCS experience.[8] In the academic 2021-2022 school year, most schools adopted a full-time in-school attendance due to the availability of vaccines and testing. However, sports teams and large classroom sizes still struggled with COVID-19 outbreaks. This highlighted the importance of keeping up with precautions to decrease exposures and encouraging vaccine acceptance.

CONCLUSIONS

In summary, it remains important to adhere to public health guidelines as more is learned about COVID-19 during this ongoing pandemic. Effective preventative measures when implemented properly and widely adopted can curb the trajectory of transmissible disease in any community. Early and open communication was key to success when multiple groups were involved, in this instance parents, students, teachers, and support staff. Trust and flexibility were needed to ensure a positive outcome. This study highlighted the safety of in-person learning in the pre-vaccine era and showcases WCS success in maintaining low COVID-19 cases at a time when very few establishments believed this was achievable.

In the WCS experience, the risk of COVID-19 infection early in the pandemic course was not increased by attending in-person school versus living in the Sedgwick County community, if CDC guidelines were followed.

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