

When COVID-19 Attend Classes with Children: A Case Report

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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Case Report

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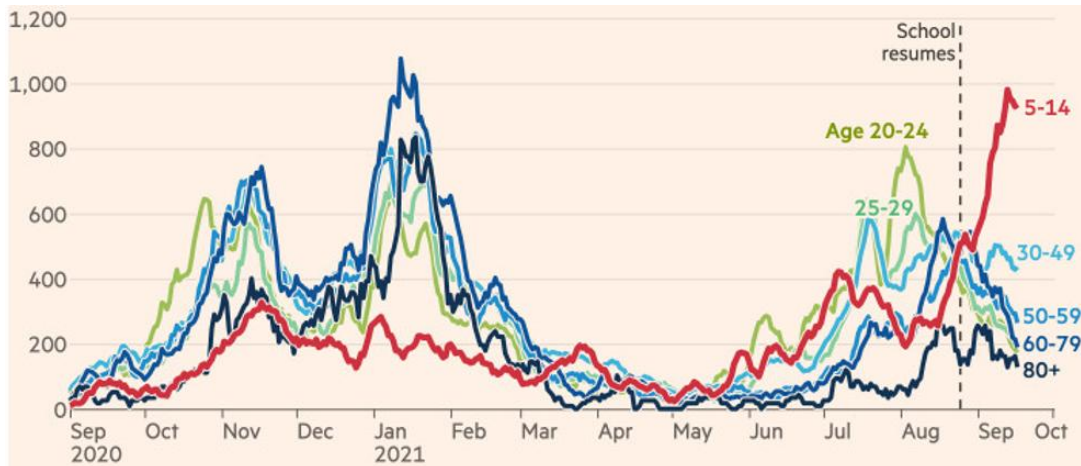
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ABSTRACT

Transmission of SAR-CoV-2 among school children had previously been viewed as insignificant. As economies attempt to open with school children returning to study; reported cases of multiple diagnoses of COVID-19 challenge the previously held notion that school children might not be significantly impacted due to limited exposure routes in school. This study focused on a case of COVID-19 diagnosed in an 8-year-old school child. A previously well child turned symptomatic and positive to PCR test 3 days after testing negative. Transmission of SAR-CoV-2 among school children is a reality. In addition to other public health measures, vaccination of school children, teachers and visitors is necessary to mitigate the exposure.

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Graphical Abstract

Source – UK government & Financial times

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1. INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is a Respiratory Tract Infection (RTI) caused by Severe Acute Syndrome Coronavirus-2 (SARS-CoV-2), the causative organism for the 2019 pandemic¹. The initial outbreak in Wuhan, China was reported in 2019 but achieved global spread in 2020 [1]. As of 17th of January 2022; 326,279,424 cases have been confirmed; including 5,536,609 reported deaths and 9,395,059,118 vaccine doses [2]. Initial public health response was directed at mitigation of COVID-19 virus on adults. Raft of mobilized measures includes social distancing, hand sanitization, use of suitable respirators, isolation, incessant and prolonged lockdowns, international border shutdowns and vaccination [1]. While several measures had been directed at the adult cohort; little or no measure was specifically devoted to the protection of school children on the premise that limited exposure routes exist in schools, and their immunity suffices and guarantees protection [3-10]. Vaccination in the adult cohort has proved seemingly effective in mitigating the severity of COVID-19 on adults; however, the emerging trend shows that school children will require vaccination to ameliorate the severity of COVID-19 as in the adult cohort [11,12]. The objective of this study is to present and analyze a case report of an unvaccinated child who became an education contact.

2. METHODS

A descriptive study of a child with COVID-19 classified as an education contact. Patient case was selected because clinical presentation was suggestive of a Coronavirus Disease and was confirmed positive by Polymerase Chain Reaction (PCR) test.

3. CASE REPORT

An 8-year-old boy with a previously normal medical history tested negative to COVID-19 following four days of class attendance and daily contacts with peers and class teacher. The class teacher was confirmed COVID-19 positive following complaints of unwellness. Afterwards, all traceable primary contacts including the class children and case in view had mandatory Polymerase Chain Reaction (PCR) test. The child of interest in this study had a negative PCR test. Two days after the negative result, the patient (child) felt unwell with a mild dry hacking cough and nasal congestion. Physical assessment by the General Practitioner (GP) revealed a clinically clear chest with no evidence of chest infection. An initial diagnosis of Upper Respiratory Tract Infection (URTI) was made with advisory on vitamin, adequate fluid intake and rest. The patient became acutely ill on the 3rd after a negative PCR test with non-productive, rapidly paced and hacking cough with feeling of acute unwellness. He was taken to the

Table 1. Observations and events during home isolation

Day	Observations
1	Acutely ill-looking with rapidly paced nonproductive dry hacking cough and feeling of grave unwellness, nasal congestion, throat pain (8/10), shortness of breath (SOB), occasional tearing. Nil vomiting and fever. Child was treated symptomatically and placed on amoxicillin for the sore throat, diclofenac throat spray for the painful throat, nasal decongestant spray for the nasal congestion and cough suppressant for the dry hacking cough.
2	The condition was the same as day 1. The Result of the rest 5 members of the family returned negative with none? feeling unwell.
3	The condition was the same as day 1 with no obvious improvement.
4	Additional holding of throat, crying, restless and twice vomiting.
5	Condition was same as above.
6	Condition was same as above. Vitamin C and Zinc supplement (pediatric formulae) was added to the therapeutic support regimen.
7	Repeat PCR test for rest 5 members of the family returned negative.
8	Reduced frequency of cough, nasal congestion relieved, verbalized feeling of wellness. Family members were discharged from Isolation.
9	Improvement continued with reduced frequency of cough, verbalized feeling of wellness, resolved nasal congestion, improved sleeping, appetite, not ill looking.
10	Sustained improvement evidenced by significantly reduced frequency of dry cough, nil nasal congestion, improved appetite, and verbalized feeling of wellness.
11	Discharged from home isolation.

emergency where a repeat PCR revealed positive COVID-19 result. The response protocol for positive PCR test was immediately activated. This includes home isolation for 10 days for the patient, notification of family members and school, PCR testing and isolation of family members for 7 days, adequate fluid and food intake, and daily observation. Patient is the youngest (4th child), an 8-year-old boy. Home isolation was eventful as presented in Table 1.

4. DISCUSSION

In pre-symptomatic COVID-19 cases, the PCR test undertaken at the onset of the incubation period will be negative. Although several data [13-16] abound on the duration of the COVID-19 incubation period, the United States (US) Centers for Disease Control (CDC) posit it ranges from 2 to 14 days [17,18]. In this study, it was however, impractical to decipher the date of infection. However, for patient to become positive three days after an initial negative test shows that he had been infected but asymptomatic during initial PCR test. A negative test does not preclude the presence of COVID-19 infection.

This justifies serial PCR testing especially in symptomatic individuals. Transmission amongst school children has been reported to be low compared with transmission in Adults [18]. Conversely, resumption of school activities would expose children to increase transmission routes including parents, peers to school, visitors,

teachers, and school staff. The risk is further amplified by prolonged indoor activities, innumerable contact points within school infrastructure, impractical social distancing proximal play contacts and more. Given the unvaccinated status of children in several climes, multiple interfaces, and risk factors in school attendance; the risk of transmission among children is significantly high. In this report, the school was temporarily shut down due to multiple cases involving children and teachers in all the classes in the school despite teachers' mandatory vaccinated status.

This corroborates the reported surge in COVID-19 cases among school children in England and US CDC position on the possibility of SAR-CoV-2 transmission among children, hospitalization, and transmissibility [18-20]. The efficacy of vaccine in mitigating ameliorating the impact or exposure to SAR-CoV-2 was put to the test as four members of the family had been doubly vaccinated. They were serially tested (PCR) on day 1 and 7 of diagnosing (PCR) the case of interest with negative results. The 3rd child who is 10yr old did not test positive in the serial PCR tests on day 1 and 7. Given the study scenario is a family setting home, cohabitation of 5 family members with a sixth but youngest with COVID-19 was a challenge [21,22].

The clinical presentations were suggestive of moderate illness. Hence home admission with symptomatic treatment sufficed. Supportive

treatment given include a nasal decongestant, antibiotics (amoxicillin), analgesics, cough suppressant, vaporizer, vitamin, and fluid intake. The patient verbalized significant relief on daily use of vaporizing hot water mixed with *eucalyptus*, *peppermints*, *oil of wintergreen* and *Lavender oil*. Daily telehealth review involved a self-administered electronic questionnaire completed by parents followed by a tele-call by a medical officer. Questions in electronic questionnaire explored and sought to know patient condition, confirm presence or absence of abdominal pain, vomiting, fever, appetite, rule-out difficulty in breathing and presence of any life-threatening situation. The medical officer calls after completion of electronic questionnaire to verbally review patient condition. The electronic questionnaire might be repeated in the evening should morning responses suggest acute condition. Welfare of the family was supported via contactless delivery by the government, non-governmental and faith-based organization. Deliveries were kept at the doctor followed by a phone call from suppliers notifying parents of delivery. This enabled parent compliance on isolation for 10 days. While the rest members of the family isolated for 7 days, the infected child was isolated for 10 days. Cohabitation during mandatory isolation of Covid patients with the rest members of the family is a grey area that presently requires more study [21,22]. In this context a room was dedicated to the patient with reduced traffic and frequent anti-virus wiping of surfaces and contact points in the house.

5. CONCLUSIONS

This case report has revealed that there is significant risk of transmission among children in school setting with significant potentials for moderate to severe illness. In addition to other public health measures, vaccination of school children, teachers and visitors is necessary to mitigate the exposure.

CONSENT

As per international standard and given that patient is a minor, a written informed consent was obtained from parents.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Osakwe Adakporia K., Menkiti O. & Ukaegbu. Three-Month Epidemiological Trend of COVID-19 in Nigeria – A Rapid Review. *Current Journal of Applied Science and Technology*. 2020; 39(26):9-18.
2. World Health Organization WHO. Coronavirus (COVID-19) Dashboard; 2021. Available:<https://covid19.who.int/>
3. Lee B, Raszka WV, Jr. COVID-19 Transmission and Children: The Child Is Not to Blame. *Pediatrics*. 2021;146(2).
4. de Souza TH, Lanziotti VS, Lee JH. COVID-19 and children: Many Questions Yet to Be Answered. *Annals of the Academy of Medicine, Singapore*. 2020;49(8):527–529.
5. Danis K, Epaulard O, Bénet T, Gaymard A, Campoy S, Botelho-Nevers E, et al. Cluster of Coronavirus Disease 2019 (COVID-19) in the French Alps, February 2020. *Clinical infecti*. UK Government & Financial Time 2021. Covid cases among England's school children hit record peak; 2020. Available:<https://www.ft.com/content/1b884913-30cb-4b3e-9a2c-643287188387>
6. Rudan I, Adeloye D, Katikireddi SV, Murray J, Simpson C, Shah SA, Robertson C, Sheikh A, EAVE II collaboration. The COVID-19 pandemic in children and young people during 2020-2021: A complex discussion on vaccination. *J Glob Health*. 2021;11:01011.
7. Munro A, Faust SN. COVID-19 in children: current evidence and key questions. *Current opinion in infectious diseases*. 2020;33(6), 540–547.
8. Wong L, Loo E, Kang A, Lau HX, Tambyah PA, Tham EH. Age-related differences in immunological responses to SARS-CoV-2. *The journal of allergy and clinical immunology. In practice*. 2020;8(10):3251–3258.
9. Ludvigsson JF. Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults. *Acta paediatrica (Oslo, Norway: 1992)*. 2020;109(6):1088–1095.

10. García-Salido A. (2020). SARS-CoV-2 children transmission: The evidence is that today we do not have enough evidence. *Acta paediatrica* (Oslo, Norway: 1992). 2020;109(9):1912.
11. Lu X, Zhang L, Du H, Zhang J, Li YY, Qu J. SARS-CoV-2 infection in children. *N Engl J Med*. 2020;382:1663–1665.
12. Kammoun, R., & Masmoudi, K. 2020. Paediatric aspects of COVID-19: An update. *Respiratory medicine and research*. 2020;78:100765.
13. Li J, Thoon KC, Chong CY, Maiwald M, Kam KQ, Nadua K, Tan NW, Yung CF. Comparative Analysis of Symptomatic and Asymptomatic SARS-CoV-2 Infection in Children. *Annals of the Academy of Medicine, Singapore*. 2020;49(8):530–537.
14. Lauer SA, Grantz KH, Bi Q, et al. The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application. *Ann Intern Med*. 2020;172(9):577-582. DOI: 10.7326/M20-0504.
15. Nie X, Fan L, Mu G, Tan Q, Wang M, Xie Y, Cao L, Zhou M, Zhang Z, Chen W. Epidemiological Characteristics and Incubation Period of 7015 Confirmed Cases with Coronavirus Disease 2019 Outside Hubei Province in China. *The Journal of infectious diseases*. 2020;222(1):26–33.
16. Cheng C, Zhang D, Dang D, Geng J, Zhu P, Yuan M, Liang R, Yang H, Jin Y, Xie J, Chen S, Duan G. The incubation period of COVID-19: a global meta-analysis of 53 studies and a Chinese observation study of 11 545 patients. *Infectious Diseases of Poverty*. 2021;10(1):119.
17. Centre for Disease Control. Symptoms of COVID-19; 2021. Available: <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>
18. Centre for Disease Control. Science Brief: Transmission of SARS-CoV-2 in K-12 Schools and Early Care and Education Programs – Updated; 2021 Available: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/transmission_k_12_schools.html
19. UK Government & Financial Time. Covid cases among England's school children hit record peak; 2021. Available: <https://www.ft.com/content/1b884913-30cb-4b3e-9a2c-643287188387>
20. Klass P, Ratner AJ. Vaccinating children against Covid-19 - The Lessons of Measles. *The New England journal of medicine*. 2021;384(7):589–591.
21. D'Onofrio LE Jr, Buono FD, Cooper M. Cohabitation COVID-19 transmission rates in a United States suburban community: A retrospective study of familial infections. *Public Health*. 2021;192:30–32.
22. Posfay-Barbe KM, Wagner N, Gauthey M, Moussaoui D, Loevy N, Diana A, L'Huillier AG. COVID-19 in Children and the Dynamics of Infection in Families. *Pediatrics*. 2020;146(2).

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