Medical Research Archives

ESMED
European Society of Medicine

OPEN ACCESS

Published: May 31, 2022

Citation Oloyede IP, Nnoli C, et al., 2022. COVID Long-Hauler Syndrome in A Nigerian Child - A Case Report, Medical Research Archives, [online] 10(5). https://doi.org/10.18103/mra.v10i5.2832

DOI https://doi.org/10.18103/mra.v10i5.2832

ISSN: 2375-1924

CASE REPORT

COVID Long-Hauler Syndrome in a Nigerian Child - A Case Report.

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Declaration of interest: None

Funding: None

ABSTRACT

Introduction: Post-covid long-hauler syndrome has been observed in up to half of the children who had symptomatic Covid with symptoms lasting beyond 120 days.

Case report: PEC, is an 11year old female who presented with a history of unproductive Cough 5/7, Fever 5/7 and breathing difficulty. Physical examination revealed an acutely ill, dyspneic and tachypneic child, with a respiratory rate of 42 cycles/min. She had vesicular breath sounds and few basal crepitations. Her SPO2 was 75% in room air. The Chest Xray showed widespread nodular opacities. Her manteoux test was 3mm. A chest CT-scan showed diffuse in-homogenous densities with fibrocystic changes seen involving both lungs with associated areas of ground glass opacification in the upper lung bilaterally. Her COVID-19 PCR test was positive. A diagnosis of COVID-19 disease was made. She was admitted into the paediatrics ward and treated with antibiotics and intranasal oxygen. Her SPO2 remained between 85-88% on oxygen and 75-79% in room air. She became stable on the 6th day of admission and parents left against medical advice.

Four months post diagnosis the child presented with cough and breathlessness. A repeat chest x-ray showed massive lung infiltrates, multiple patchy opacities and hyperinflated lung fields. Her ESR was 30mm in the first hour. A lung function test was suggestive of severe restrictive/obstructive abnormality. The 2- dimensional echocardiography was normal. A diagnosis of Post-covid 19 interstitial lung disease was made and she was placed low dose prednisolone 2mg/kg for six weeks. Her response to treatment will be assessed in subsequent follow-up.

Conclusion: Post COVID long-hauler syndrome is present in children who survive COVID-19. A high index of suspicion is required to diagnose and offer the correct treatment.

Keywords: Post-COVID. Long-hauler, Interstitial lung disease, Nigeria

Introduction

Post-COVID long-hauler syndrome, long COVID or post-acute COVID-19 has been observed in up to half of the children who had symptomatic COVID-19 with symptoms lasting beyond 120 days.[1] Until recently, a consensus definition of the condition in children had not been reached because of its novel nature. It had been widely accepted to be the presence of symptoms, weeks or months after acquiring SARS-CoV-2 infection irrespective of the viral status of the patient.[2] However, a group of researchers in the UK have arrived at a research definition for long COVID in children following a rigorous consensus definition process.[3] They have defined long COVID as a "post-COVID-19 condition which occurs in a child or young people with a history of confirmed SARS CoV-2 infection, with at least one persisting physical symptom for a minimum duration of 12 weeks after initial testing that cannot be explained by an alternative diagnosis; the symptoms have an impact on everyday functioning, may continue or develop after COVID-19 infection, and may fluctuate or relapse over time" [3] There still remains the diagnostic challenge posed by children with acute COVID-like symptoms with a negative reverse transcriptase-polymerase chain reaction result (RT-PCR) and who also have long COVID symptoms.[4] The research definition is similar to the World Health Organisation clinical case definition for adults which also went ahead to specify the symptoms as fatigue, shortness of breath and cognitive dysfunction.[5] Post-COVID long-hauler syndrome has also been seen to present with a residual pulmonary disease similar to interstitial lung disease.[6]

Studies on long COVID are fewer in children compared with the adult population.[1] This may be due to the milder course of the disease in children or it may also be as a result of the greater ethical challenges involved in paediatric research. Up to half of the children who tested positive to SARS-CoV-2 at some point in time in the height of the pandemic have gone on to have at least one symptom of post-COVID long hauler syndrome 120 days after initial diagnosis.[7] Lower proportions of 8% to 10% have been reported.[8,9] These symptoms involve a wide range of body systems and include unexplained fatigue, memory loss, seizures, hallucinations, testicular pain, dyspnoea, muscle and joint pains as well as heart palpitations.[1,10] What is significant is that majority of these symptoms have been serious enough to affect daily living in these children. There is a paucity of research from Nigeria on this condition. We therefore present the case of a child who had acute respiratory symptoms, tested positive to SARS CoV-2 with RT-PCR and then developed progressively worsening breathlessness several months after initial diagnosis. Informed consent was obtained from the caregiver and assent was obtained from the patient.

Case Report

PEC, is an 11year old female who presented with a history of unproductive cough, fever and breathing difficulty all of five days' duration. Physical examination revealed an acutely ill, dyspnoeic and tachypnoeic child, with a respiratory rate of 42 cycles/min. She had vesicular breath sounds and few basal crepitations. Her SpO2 was 75% in room air. The Chest X-ray showed widespread nodular opacities. (Figure 1)

Figure 1: Chest x-ray at presentation showing nodular opacities at first presentation

A chest CT-scan showed diffuse in-homogenous densities with fibrocystic changes seen involving both lungs with associated areas of ground glass opacification in the upper lung bilaterally. (Figure 2)

Her COVID-19 PCR test was positive. A diagnosis of COVID-19 disease was made. She was admitted into the paediatric ward and treated with antibiotics and intranasal oxygen. Her SO2 remained between 85-88% on oxygen and 75-79% in room air. She became stable on the 6th day of admission and parents left against medical advice.

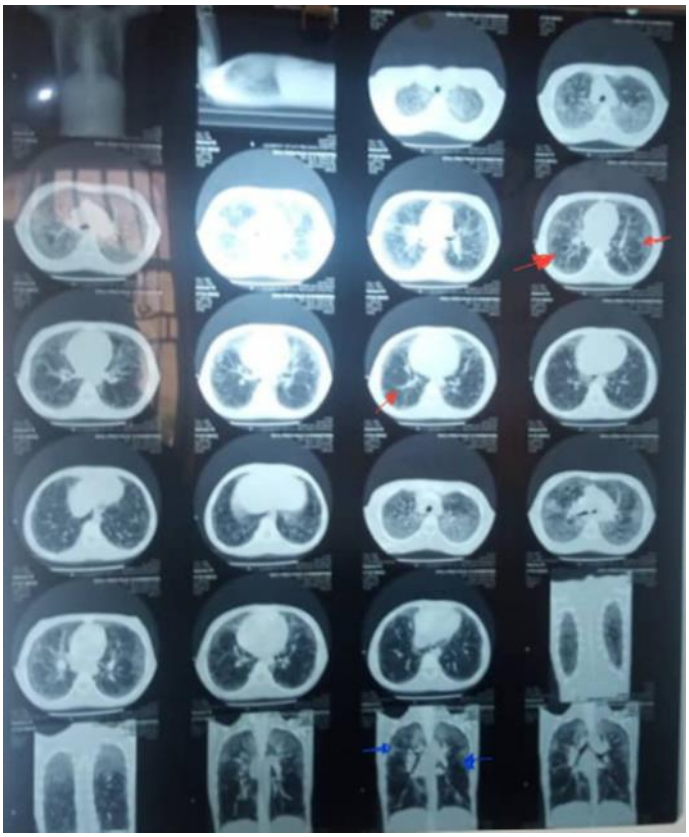

Figure 2: CT scan showing in-homogeneous densities & fibrocystic changes

Four months post diagnosis the child presented with cough and breathlessness that worsened with exertion. There was no history of haemoptysis. A repeat chest x-ray showed massive lung infiltrates, multiple patchy opacities and hyperinflated lung fields. (Figure 3) Her ESR was 30mm in the first hour. Her Mantoux test was 3mm. A lung function test was suggestive of severe restrictive/obstructive abnormality. The 2- dimensional echocardiography was normal. A diagnosis of post-COVID 19 interstitial lung disease was made and she was placed on amoxicillin – clavulanic acid, vitamin c, zinc gluconate and low dose prednisolone 2mg/kg for six weeks. Her response to treatment will be assessed in subsequent follow-up.

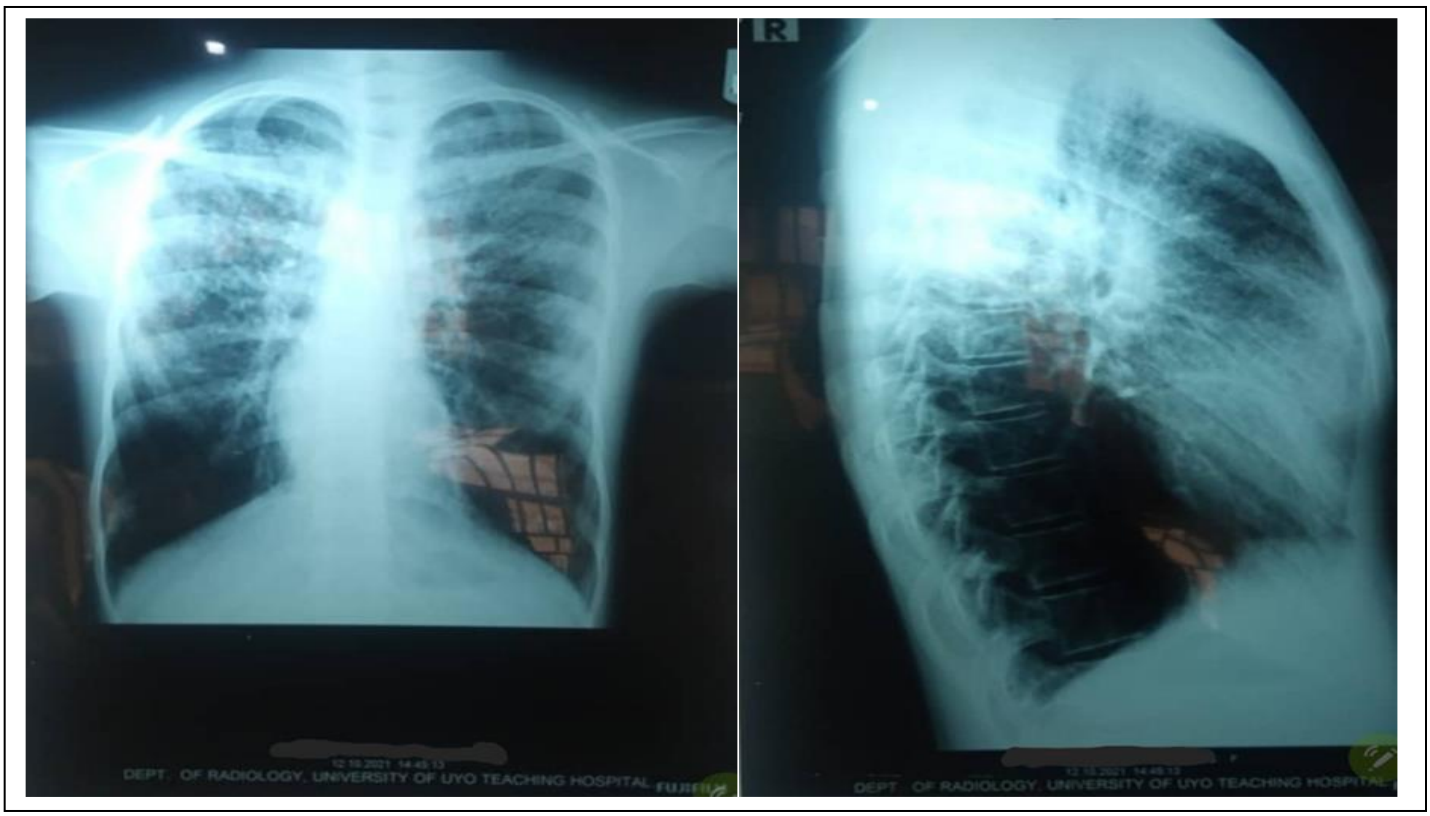

Fig. 3. Repeat Chest X-ray revealing lung infiltrates & patchy opacities (AP and Lateral view)

Discussion

Our index patient was 11 years and this corresponds to a study in the United Kingdom, which reported that up to 12.9% of children who had long COVID were in the 2 to 11 years age group.[1] Also, the median ages of children in a Swedish long COVID cohort study and a similar Italian study were 12 and 11.4 years.[7,9] Our patient was female and this is in keeping with the report by Ludvigsson [11] of a male to female ratio of 1:4. Lopez *et al*[12] also obtained the finding of predominantly adolescent children with long COVID symptoms and half of them were females.

The pathophysiology of post-acute COVID-19 syndrome has been linked to a Virus-specific injury; immunologic aberrations and inflammatory damage resulting from the acute infection; and postcritical illness sequelae. Most cases are linked to symptomatic COVID and those with asymptomatic SARS-CoV-2 infection rarely develop post-acute COVID-19 syndrome. [13]

The symptoms exhibited by our index patient were exertional dyspnoea and chronic cough. These symptoms are in keeping with a longitudinal cohort study by Dolezalova *et al* in the Czech Republic who reported exertional dyspnoea and chronic cough as the predominant respiratory symptoms of long COVID among children.[14] Other symptoms reported but not experienced by the patient include haemoptysis and chest pain.[14] Reports have identified Fatigue as the most common symptom, followed by myalgia, dyspnea, chest pain and joint pains. Neurologic manifestations, particularly brain fog, numbness and tingling throughout the body can also occur. Adverse mental health outcomes including anxiety, depression, post-traumatic stress disorder, and sleep abnormalities have also been reported to occur in patients with prolonged hospital stay.[13] Our patient, however did not present with any mental health issues as her hospital stay was very brief.

Our patients repeat chest x-ray, showed massive lung infiltrates, multiple patchy opacities and hyperinflated lung fields, probably as a result of residual pulmonary disease following COVID. This residual pulmonary disease is sometimes referred to as "post-COVID interstitial lung disease" or "long COVID interstitial lung disease" (LC-ILD) and survivors have been thought to have residual abnormalities such as fibrotic changes in their chest

CT scan although studies have not extended beyond 6 month post infections.[6] Chronic inflammation following SARS-CoV-2 infection leading to epithelial damage and fibroblast activation has been implicated in the etiopathogenesis of LC-ILD.[15] Further production of mediators such as transforming growth factor β1 (TGF-β), vascular endothelial growth factor (VEGF), interleukin-6 (IL-6), tumor necrosis factor-α (TNF-α), metalloproteinases and even more vascular dysfunction further worsen disease progression.[15]
Our patient demonstrated some of the common radiological findings seen in post-COVID lung disease. These include bilateral ground glass opacities, centrilobular nodular opacities, coarse reticular opacities, air-trapping, interlobular septal thickening and cystic lucencies.[16] A correlation has also been observed in the degree of ground glass opacity seen in adult CT scans during the acute phase of infection and fibrotic changes noted up to 6 months after infection.[17] It is likely that the same picture will present itself in children experiencing this sequela. The finding of a restrictive/obstructive pattern of lung function test in our index patient are in keeping with childhood interstitial lung disease.[18] While the restrictive pattern is the usual presentation, a mixed obstructive-restrictive result may be obtained.[18] Two-dimensional echocardiography to rule out possible cardiac aetiology, lung function test, auto-antibody tests, environmental organic dust exposure testing & bronchoalveolar lavage are usually indicated in the management of post-COVID lung disease.[18] However. Only a two-dimensional echocardiography was available in our facility and the findings were normal for our patient. The management of post-COVID interstitial lung disease includes the use of steroids, hydroxychloroquine, azithromycin, antifibrotics such as pirfenidone and nintedanib. [14] However, the index patient received steroids only as a specific treatment for her condition during follow-up.

Conclusion

Post COVID long-hauler syndrome is present in children who survive COVID-19. A high index of suspicion is required to diagnose this condition especially as the disease is more often overlooked in the paediatric population and there is growing evidence that it will contribute to significant morbidity among children. It also necessary to develop possible clinical care guidelines in the face of the wide variability of presentation of the syndrome.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

1. Thomson H. Children with long covid. *New Sci*. 2021 Feb 27;249(3323):10–11.
2. Raveendran AV, Jayadevan R, Sashidharan S. Long COVID: An overview. *Diabetes Metab Syndr*. 2021;15(3):869–75.
3. Hicks R. Research Definition for "Long COVID" in Children and Young People Agreed- *Medscape*- Feb 08, 2022 [Internet]. [cited 2022 Feb 13]. Available from: https://www.medscape.com/viewarticle/968062
4. Raveendran AV. Long COVID-19: Challenges in the diagnosis and proposed diagnostic criteria. *Diabetes Metab Syndr*. 2021;15(1):145–6.
5. Soriano JB, Murthy S, Marshall JC, Relan P, Diaz JV; WHO Clinical Case Definition Working Group on Post-COVID-19 condition. A clinical case definition of post COVID-19 condition by a Delphi consensus. *Lancet Infect Dis*. 2022 APr; 22(4): e102-e107. doi:10.1016/S1473-3099 (21)00703-9.
6. Wild JM, Porter JC, Molyneaux PL, George PM, Stewart I, Allen RJ, *et al*. Understanding the burden of interstitial lung disease post-COVID-19: the UK Interstitial Lung Disease-Long COVID Study (UKILD-Long COVID). *BMJ Open Respir Res*. 2021;8(1):e001049.
7. Buonsenso D, Munblit D, De Rose C, Sinatti D, Ricchiuto A, Carfi A, *et al*. Preliminary Evidence on Long COVID in children. *Acta Paediatr*. 2021 Jul; 110(7):2208-11. doi:10.1111/apa.15870. Epub 2021 Apr 18. PMID:33835507; PMCID: PMC8251440. [Accessed 2022 Apr 14].
8. Say D, Crawford N, McNab S, Wurzel D, Steer A, Tosif S. Post-acute COVID-19 outcomes in children with mild and asymptomatic disease. *Lancet Child Adolesc Health*. 2021;6:e22–3.
9. Sterky E, Olsson-Åkefeldt S, Hertting O, Herlenius E, Alfven T, Ryd Rinder M, *et al*. Persistent symptoms in Swedish children after hospitalisation due to COVID-19. *Acta Paediatr*. 2021;110(9):2578–80.
10. Kabi A, Mohanty A, Mohanty A, Kumar S. Post COVID-19 Syndrome: A Literature Review. *J Adv Med Med Res*. 2021 Feb 4;32:289–95.
11. Ludvigsson JF. Case report and systematic review suggest that children may experience similar long-term effects to adults after clinical COVID-19. *Acta Paediatr*. 2021;110(3):914–21.
12. Nogueira López J, Grasa C, Calvo C, García López-Hortelano M. Long-term symptoms of COVID-19 in children. *Acta Paediatr*. 2021;110(7):2282–3.
13. Ramakrishnan RK, Kashour T, Hamid Q, Alwani R, Tieyjeh IM. Unravelling the mystery surrounding Post-Acute Sequelae of COVID-19. *Front. Immunol*., 2021; 12;686029. doi:10.3389/fimmu.2021.686029
14. Doležalová K, Tuková J, Pohunek P. The respiratory consequences of COVID-19 lasted for a median of 4 months in a cohort of children aged 2–18 years of age. *Acta Paediatr* 2022; 00: 1-6. doi:10.1111/apa.16297. [accessed 2022 Apr 15]
15. Singh A, Kumar O, Bansal P, Margekar S, Aggarwal R, Ghotekar L, *et al*. Post-COVID Interstitial Lung Disease - The Looming Epidemic. *J Assoc Physicians* India. 2021 Jul 1;69 (7): 11-12. PMID:34431265.
16. Wu M, Sharma PG, Rajderkar DA. Childhood interstitial lung disease: A case-based review of the imaging findings. *Ann Thorac Med*. 2021;16(1):64–72.
17. Wells AU, Devaraj A, Desai SR. Interstitial Lung Disease after COVID-19 Infection: A Catalog of Uncertainties. *Radiology*. 2021 Apr 1;299(1):E216–8.
18. Bush A, Cunningham S, Blic J de, Barbato A, Clement A, Epaud R, *et al*. European protocols for the diagnosis and initial treatment of interstitial lung disease in children. *Thorax*. 2015 Nov 1;70(11):1078–84.