

Use of Continuous Positive Airway Pressure (CPAP) in an Infant with COVID-19 patients in a tertiary care center of Gandaki Pradesh, Nepal

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ABSTRACT



COVID-19 in infancy is a rare disease among all COVID-19 patients. Here we report a case of 2 months old male child who was brought by parents with the complain of fever and running nose for 2 days. He was being treated with antibiotics and antipyretics from local pharmacy without improvement and was admitted in hospital for intravenous antibiotics. On 5th day of admission baby developed grunting and respiratory distress so referred to tertiary center for possible covid-19 infection. Further investigations led to the positivity of COVID-19 in PCR test. He was treated with antibiotics, steroids and kept in CPAP during respiratory distress for 40 hours and then to high flow oxygen therapy via hood box. CPAP during respiratory distress responded to the treatment dramatically. COVID-19 infection among infant though rare, it is important to consider CPAP and oxygen therapy via hood box as an important treatment modality in COVID-19 patients.

Keywords: COVID-19; CPAP; Fever; Infant

INTRODUCTION

Since December 2019, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, also known as COVID-19 has become a breathtaking challenge among healthcare providers and governments worldwide. In March 2020, the World Health Organization (WHO) announced a Pandemic situation, and until now, unfortunately, this pathogen has had thousands of victims infected and died.¹ The clinical presentations of COVID-19 are different for various patients, which made its diagnosis a challenging task for healthcare

providers. Fever, dry cough, dyspnea, myalgia, diarrhea, etc. are the most frequent presentations of the COVID-19.² In children, it seems that the novel coronavirus mostly appears as a mild condition; however, in some cases, it may have fatal consequences.³⁻⁵ The current study aimed to report an infant, firstly presented with fever and running nose, subsequently developed respiratory distress despite giving wide spectrum antibiotics later diagnosed as COVID-19. It is probably the first case reported of this presentation in infant at the age of 2 months with the novel coronavirus in Nepal.

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CASE REPORTS

A 2 months old male infant from Pokhara, Nepal, presented with complaints of fever up to 102.4⁰F for 2 days along with runny nose. Mother also had such symptoms one week back but subsided itself. He was first treated with oral cefixime drops and paracetamol for two days from local pharmacy. The fever didn't subside and came to local hospital where he was admitted and treated with cefotaxime and amikacin for 3 days. Simultaneously the blood investigations were sent for workup. Chest X-ray was done. Complete blood count was within normal range and chest x ray was normal (as shown in Picture-1). On 4th day of admission also fever did not subside instead started to develop grunting and shortness of breath so referred to Pokhara Academy of Health Sciences (PAHS), Pokhara for possible COVID -19 infection. Child was immunized with BCG vaccine and was from low socioeconomic background with normal birth and perinatal history.

On examination, the child was in respiratory distress with respiratory rate of 94/minute and temperature of 100.6⁰F and SPO₂ of 80 at room air. On respiratory examination there was occasional crackles over B/L mammary regions. Prominent subcostal recession was there and audible grunting was present. Blood parameters were within normal limits. Chest X-ray was repeated and showed B/L infiltrations over upper zones (Picture-2). PCR test for Covid-19 was done and came to be positive along with his father and mother.

Baby was kept in Pediatric Intensive Care Unit (PICU) with bubble continuous positive air way pressure (CPAP) as Downe's scoring was more than six for 40 hours, with FiO₂: 0.95 initially decreasing it up to 0.4 with Positive End Expiratory Pressure(PEEP) 5-7cm of H₂O. Downe's scoring was reassessed and after improvement baby was started with high flow oxygen therapy via hood box for next 48

hours(Picture-3) along with steroid therapy and broad spectrum antibiotics (inj. Piperacilin Tazobactam+ Vancomycin) for 5 days. There is no subjective complaint and patient is now fully cured and is under our regular follow up.



Figure1: Normal Chest



Figure 2: B/L infiltrations over upper lobes



Figure 3: High flow O₂ therapy via hood box

DISCUSSION

Most of the COVID-19 cases experienced fever, myalgia, dry cough, and respiratory illness at the onset of the disease but in children, the novel coronavirus mostly appears in a mild form however, in some cases may cause fatal consequences.⁵ Fever and rash were the first presenting symptoms in some case⁶ but in this case no rashes were there. During the hospitalization, the child was not complicated with generalized edema and hypoalbuminemia, the rare manifestations of coronavirus infection and their incidence is rarely reported in children.⁷ Pleural effusions is a rare manifestation of COVID-19, particularly in children.^{8,9} In this case also there was no any pleural effusion.

In china among children where this disease was thought to be originated, clinical manifestations were generally less severe than those of adult patients but young children, particularly infants, were vulnerable to infection.¹⁰ The most common symptoms were running nose and fever as in this case.

In a single center's observational study among clinical features of severe pediatric patients with COVID-19 in Wuhan, China, tachypnea was the most common symptom, followed by fever and cough.¹¹ Multiple patch-like shadows and

ground-glass opacity was present in chest X-ray and a cytokine storm was found in those patients, which appeared more serious in critically ill patients. Child also had tachypnea, fever and multiple patch like shadows in chest X-Ray on 4th day of illness when he was admitted in PAHS, Pokhara.

In another observational study in France, the five infants with COVID-19 were healthy, but were admitted with poorly tolerated and isolated fever.¹² Neither the infants received steroidal anti-inflammatory drugs before admission nor they had any respiratory symptoms before or during hospitalization and they did not need intensive care also. But according to the latest WHO guidelines, the children with moderate and severe symptoms, along with the children with mild symptoms but with underlying risk factors, are recommended to seek hospital admission, and emergency treatment should be started according to the disease severity.¹³ As per latest Nepal pediatric society guidelines in resource limited settings, bubble CPAP should be considered for respiratory support in children with hypoxemia, severe pneumonia and/or ARDS.¹⁴ Ground glass opacities, peribronchial thickening, Linear opacities, consolidation, and pulmonary nodules are the common CT chest findings in infants of COVID-19 than in adults.¹⁵ Unfortunately, we didn't have CT scan in our center so couldn't do it, which was the main limitation of the case.

CONCLUSIONS

COVID-19 in infancy is a rare disease among all COVID-19 patients. Respiratory distress and fever are the most important clinical features and radiological findings support it. Understanding the exact reason for such presentations need further investigations. Bubble CPAP and high flow oxygen therapy via hood box in infancy is very helpful for the successful management of COVID-19 patients.

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