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Pediatric Patient with Primary Ciliary Dyskinesia: Treatment of infection episode with The Frequencer® V2x

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Results from case reports are not predictive of results in other cases. Results in other cases may vary.

Introduction

Primary Ciliary Dyskinesia, also known as PCD, is a rare genetic condition resulting in the dysfunction of the cilia in the respiratory system. Cilia are responsible for clearing the airways of mucous that binds bacteria, dust and small particles that are inhaled.¹ When the cilia in the respiratory system lining the airways do not function correctly or are not present, mucous clearance from the lungs is impaired. When bacteria and irritants in the mucous are not cleared, this leads to infections, respiratory distress and recurrent pneumonia.² The main goal of any treatment used is to ensure that the lungs remain as clear of mucous build-up as possible. Chest physiotherapy treatments consist of external mechanical maneuvers that aid in clearance of mucous from the lungs. “Clapping” is the most commonly used method, however, can be contraindicated for babies and individuals who have gone through surgery. This method can also be very demanding on the clinician or parents administering the treatments daily. The Frequencer® V2x promotes airway clearance by inducing vibration in the chest walls through acoustic waves. This device provides a gentler, less painful form of therapy from the traditional “clapping” method of postural drainage therapy, allowing it to be used autonomously by the patient and on individuals who cannot be treated by clapping.

Patient Data

- Age: Gender: 7-year-old boy
- Disorder: Ciliary Dyskinesia
- Diagnosis 4 years after first infections by ENT.
- Previous Therapies: Clapping (administered by the mother), nebulizer, Ventolin and Cortisone inhalers. When Patient is infected, antibiotics are administered 3 times per day.

Patient Medical History

When the patient was younger and first entered day care, the patient was constantly sick and often hospitalised. The patient would become ill for 5–6 days at a time with a fever of 106 °F (41 °C). Four years after the first event, the patient was seen by an ENT specialist who finally diagnosed the patient with ciliary dyskinesia. The patient was then put on a regiment of “clapping”, nebulization therapy, bronchodilator and steroid inhalers, and regular antibiotic treatment for infection. The patient’s mother performed clapping once per day, in the evenings since it is harder to invest the time in the morning. Clapping was physically demanding and time consuming for the patient’s mother. The patient needed assistance with treatments since clapping cannot be done autonomously. Nebulizers were used morning and night for 20 minutes per treatment. When the patient was going through an infection it lasted 1–2 weeks at a time.

Case Presentation

We report the case of a 7-year-old boy diagnosed with Primary Ciliary Dyskinesia. The chest physiotherapy treatment used in the past was clapping. This child was loaned a Frequencer® V2x from CLSC (local community service centre) in Quebec after it was recommended by the treating physician after the patient was presented with a severe upper respiratory and sinus infection. It was prescribed that child uses the Frequencer® twice per day when infected and once per day when not infected as a means of prevention.



Results

Within 2 days of initiating the Frequencer® at the onset of infection, at a frequency of 50Hz and an intensity of 60%, for a total of 20 minutes twice per day, resulted in the infection completely subsiding. Previously, his infections would last 1-2 weeks. The Frequencer® was used in 4 regions (Upper and lower lobes on the left and right front side of the thorax) for 5 minutes each. Coughing efficiency was reported to increase dramatically after treatments with the Frequencer®. The expectorations were large, and a yellow color, a result that the patient had never experienced before. The Frequencer® is used once daily when Patient is not infected and twice daily when infected. The patient uses the Frequencer® autonomously, after the device is set-up with the appropriate parameters. The family reports that the treatment using the Frequencer® is much shorter than the treatment previously being used. The patient and the patients' family report to have an increase in quality of life and are confident it will continue to improve moving forward. The family is confident that the use of the Frequencer® will also aid in the prevention of future infections. The family states that the Frequencer® has made life easier and are happy to have found a device that is easy to use, easy to clean and helps them effectively treat their son.

Key Message

Using the Frequencer® on a patient with Ciliary Dyskinesia, dramatically decreased the time spent in an infected state. The device helped make coughing more efficient resulting in larger expectorations of infected yellow mucous and decreased the frequency of coughing. The family using the device has experienced an increase in quality of life.

References

1. National Heart, Lung, and Blood Institute; National Institutes of Health; U.S. Department of Health and Human Services.
2. "Learn About Primary Ciliary Dyskinesia (PCD)." American Lung Association, 5 Apr. 2018, www.lung.org/lung-health-and-diseases/lung-disease-lookup/primary-ciliary-dyskinesia/learn-about-primary-ciliary.html.