Orthopnea: This time it is not the Heart Failure; A Rare Case of bilateral diaphragmatic paralysis

Muhammad Irfan Malik, Khalid Waheed, Arslan Iqbal

Department of Pulmonology, PGMI Lahore General Hospital, Lahore - Pakistan

Address for correspondence
Muhammad Irfan Malik
Department of Pulmonology, PGMI Lahore General Hospital, Lahore - Pakistan
Email: drirfanmalik@gmail.com

Date Received: April 26, 2020
Date Accepted: June 27, 2020

Declaration of conflicting interests

The authors declare that there is no conflict of interest.

Abstract

Background: Diaphragmatic paralysis is a rare reason of pulmonary dysfunction that may lead to severe illness. It may cause shortness of breath, orthopnea, sleep apnea and respiratory failure. Bilateral diaphragmatic paralysis is a very uncommon cause of respiratory failure which always remain underdiagnosed.

Key Words: Orthopnea; Paralysis BDP

This case report may be cited as: Malik MI, Waheed K, Iqbal A. Orthopnea: This time it is not the Heart Failure; a Rare Case of bilateral diaphragmatic paralysis. Pak J Chest Med 2020; 26 (3):150-151

Introduction

Diaphragmatic paralysis is a rare reason of pulmonary dysfunction that may lead to severe illness. It may cause shortness of breath, orthopnea, sleep apnea and respiratory failure.[1] Bilateral diaphragmatic paralysis is a very uncommon cause of respiratory failure which always remain underdiagnosed.[2] It can be neuropathic or myopathic. Its symptoms depend on its unilateral or bilateral involvement, under lying pulmonary disease or its progression. Unilateral diaphragmatic paralysis is usually asymptomatic however bilateral paralysis always remain undiagnosed especially in patients who are on ventilator, cardiopulmonary failure or Cor-pulmonale. Hence prompt diagnosis of BDP is challenging clinically and depends upon a proper clinical history, laboratory investigations and clinical expertise.[3] Here we are reporting a case of middle-aged women who had history of recent myocardial infarction and presenting with history of dyspnea and orthopnea which is a rare case of bilateral diaphragmatic paralysis confused with heart failure due to myocardial infarction.

Discussion

Diaphragm is the main muscle of inspiration. Its bilateral paralysis causes severe restrictive ventilatory weakening along with reduced pulmonary functions with noteworthy drop in vital capacity even in supine position.[4]

BDP is difficult to diagnose, as normal hemidiaphragm cannot be compared with abnormal one. Chest radiography and fluoroscopy showed bilateral elevation that may yield false interpretations. Two-dimension ECG for the movement of dome of diaphragm may also share the same limitations. Due to technical limitation phrenic nerve conduction studies may also limit the diagnosis of BDP. The gold standard diagnostic test is transdiaphragmatic pressure (PDI) in which a thin tipped polyethylene catheter is placed in stomach and esophagus and transdiaphragmatic pressure is unable to generate which is measured.[5]

Severe BDP may be clinically diagnosed by physical examination, orthopnea, measuring vital capacity and reduction in respiratory pressures. On clinical examination bilateral dullness on percussion, absent breath sounds, absent breath sounds and partial excursion of diaphragm. Similarly, patient use accessory muscle for breathing, patient may become dyspneic and tachypneic. These symptoms may get worsen in supine position. All these sign and symptoms may misinterpret with signs of heart failure.[6,7] In our case all these sign and symptoms were present and as the patient had attack of myocardial infarction 2 months back, we supposed this case as sequalae of heart failure due to MI.

In polymyositis progressive muscle weakness is seen. The patient may present with dyspnea and on neurological examination may show bilateral muscles weakness of limbs. There lung function tests showed restrictive syndrome with total lung capacity 70% and VC 67%. Ultrasound of diaphragm may show thickening fraction of 18%, which confirm BDP. The muscle enzymes may raise and serological tests for autoimmune diseases may also raise. Muscle biopsy revealed inflammatory cells on histopathological investigations. All these tests are also seen positive, suggestive for polymyositis in our case report.[8]

Once the diagnosis is made of BDP, treatment will be depending on underlying correctable reasons. Patients can be treated with BiPAP nasal mask avoiding tracheostomy. Noninvasive positive pressure ventilation NPPV is considered to be a golden tool of treatment in BDP and in neuromuscular pathological disorder of diaphragm.[9] For treating myositis corticosteroids along with immuno-suppressive therapy is used in combination conventionally.[10]

In conclusion, the dysfunctions of diaphragm are associated with very important clinical sequalae. Their identification of origin, sign and symptoms should be identified thoroughly. Ultrasound is a simple modality to identify diaphragmatic paralysis and these dysfunctions should be treated in experienced centers. Simple non-invasive treatment can be used for the treatment of bilateral diaphragmatic paralysis.

References

1. Legarreta C, Folco JB, Burgos D, Arce S, Luna C. Bilateral diaphragmatic paralysis after an unusual physical effort. Respiratory medicine case reports. 2018 Jan 1;23:145-7.
2. Scott D, Michael J. A Case of Bilateral Diaphragmatic Paralysis. Proceedings of UCLA Healthcare. 2016;20.
3. Chen HY, Chen HC, Lin MC, Liaw MY. Bilateral diaphragmatic paralysis in a patient with critical illness polyneuropathy: a case report. Medicine. 2015 Aug;94(31).
4. Pasparaki E. Neuromuscular diseases and respir atory system. ΠΝΕΥΜΩΝ. 2017 Jul 1;30(3): 176-87.
5. Qureshi A. Diaphragm paralysis. Semin Respir Crit Care Med 2009; 30:315-20.
6. Fishman AP, Elias JA. Fishman's pulmonary diesease and disorders 4 th ed.
7. Takakura Y, Furuya H, Yamashita KI, Murai H, Araki T, Kikuchi H, Ohyagi Y, Yamada T, Kira JI. A case of Charcot-Marie-Tooth disease (CMT) type 1 complicated by diabetes mellitus (DM) showing bilateral phrenic nerve palsy. Rinsho shink-eigaku= Clinical neurology. 2002 Apr; 42(4):320-2.
8. Lelievre MH, Stiennon O, Botez S, Dube BP. Sporadic Inclusion Body Myositis Presenting with Prominent Bilateral Diaphragmatic Weakness: A Case Report. InA48. DYSPNEA: CASE REPORTS I 2018 May (pp. A1798-A1798). American Thoracic Society.
9. Ricoy J, Rodríguez-Núñez N, Álvarez-Dobaño JM, Toubes ME, Riveiro V, Valdés L. Diaphragmatic dysfunction. Pulmonology. 2018 Dec 1.
10. Oddis CV, Aggarwal R. Treatment in myositis. Nature Reviews Rheumatology. 2018 Mar 29.