

# A Physiotherapeutic Approach Along with Bronchodilators to Control Bronchial Asthma in a 35 Year old Adult: A Case Report

## ABSTRACT:

**Background:** Bronchial asthma is a common disease characterized by the generalized narrowing of intrapulmonary airways accompanied by breathlessness and wheezing, which differs in severity spontaneously or as a result of treatment. Asthma is caused by bronchial wall inflammation and constriction due to the hyper-reactivity of their smooth muscle, resulting in a series of spasmodic wheezing attacks and shortness of breath (SOB).

**Case description:** The patient was a 35 year old female presented with a complaint of dry cough with mucoid expectoration and chest pain since 3 weeks. The cough was progressive and aggravating while walking or while doing any sort of activity and it used to relieve at rest. She also complained of MMRC grade 2 breathlessness along with palpitation while doing household work. She had chest pain while coughing on left side over the 2<sup>nd</sup> intercostal space which was gradually progressive and 7/10 on VAS. She also had low grade fever, cold with chills and night sweats. The patient had a history of seasonal variation, dust allergies and biomass exposure. She was given medications but was not relieved so she was referred for physiotherapy. Physiotherapy treatment was started. Patient's sleep was disturbed. The patient had no past history. Family history is not present.

**Diagnosis:** The patient was diagnosed with bronchial asthma.

**Outcomes- & conclusion:** This case study showed that breathing exercise, postural drainage and proper relaxation of the patient may reduce the symptoms associated with bronchial asthma also the peak flow values may increase with breathing retraining. Pain reduces with reduction in cough and episodes of dyspnoea. Also educating the patient about prevention of asthmatic episodes help the patient in many ways. Along with bronchodilators physiotherapy plays an integral part in treating the patient with bronchial asthma.

**Keywords:** Bronchial asthma, chest physiotherapy, breathing exercises, asthma, COPD

## Introduction:

Bronchial asthma is a common condition characterized by a generalized narrowing of the intrapulmonary airways followed by wheezing and breathlessness, which spontaneously or as a consequence of treatment varies in severity. Symptoms may be episodic, but the pattern may vary greatly from time to time in individual cases. Hypertrophy and hyperplasia of the bronchial smooth muscle, thickening of the epithelial basement membrane of the airways, oedema and eosinophil bronchial wall infiltration, and hypertrophy of the bronchial mucous glands, with an increase in the number of goblet cells, are the modifications that cause airway obstruction in asthma. (1) A recent long-term prospective analysis found that the real mortality rate of asthmatics is higher than expected mortality, common in young subjects. (2) The average rate of death from asthma in the 5-34 year age group has remained remarkably stable over the last century, apart from a brief outbreak of death in the 1960s. (3)

Asthma is caused by bronchial wall inflammation and constriction due to the hyper-reactivity of their smooth muscle, resulting in a series of spasmodic wheezing attacks and shortness of breath (SOB). For dyspnoea and hyperventilation, most patients suffering from asthma will seek physiotherapy. The aim of physiotherapist is to improve breathing technique. (4)

**Patient's Information:** The patient was a 35 year old female having a history of seasonal variation and dust allergies. She presented with a complaint of cough with mucoid expectoration and chest pain since 3 weeks. The cough was progressive and aggravating during walking or while doing any sort of activity. ~~While coughing She had chest pain while coughing on left side over the 2<sup>nd</sup> intercostal space.~~ At rest she would feel relief. She also complained of MMRC grade 2 breathlessness along with palpitation while doing household work. She had chest pain while coughing on left side over the 2<sup>nd</sup> intercostal space which was gradually progressive and 7/10 on VAS. She also had low grade fever, cold with chills and night sweats and complained of disturbed sleep. The patient had a history of seasonal variation, dust allergies and biomass exposure. She was given medications but was not relieved so she was referred for physiotherapy.

**Comment [111]:** If describe detailed medications, such as detailed medicine, that would be better.

### **Clinical Findings:**

The patient's physical examination was carried out after obtaining informed consent. The patient was alert, cooperative and well-oriented with time, location and individual on a general examination and was relaxed in a supine and sitting position. The patient was afebrile at the time of examination. Pulse rate was 104 beats/min and respiratory rate was 22 breaths/min blood pressure of the patient was 130/70mmhg. Pallor was present.

Respiratory examination was done on inspection the chest appeared bilaterally symmetrical. Shape of chest was normal and bilateral movement of the chest was equal. The patient use to sit in slouch position. The breathing pattern was Thoraco-abdominal breathing pattern. Use of accessory muscle for breathing was present.

On palpation, tenderness was present over 2<sup>nd</sup> and 3<sup>rd</sup> intercostal space on the left side which was grade 1. On auscultation bilateral wheezes, bilateral spasm and bilateral crepitation were present. Intensity of the breath sound was normal. Tactile fremitus was equal on both sides. There was hyper-resonance over both lungs. Cardiac dullness and liver dullness was present. Cardiovascular examination was done which showed normal heart rate, regular rhythm the patient had no heart murmur. S1, S2 present. Apex beat was not visible. No focal neurological deficits.

Abdominal examination – soft, non-tender, bowel sounds present.

### **Medication included:**

INJ Augmentin 1.2gm I/V BD \* 9 days  
INJ Hydrocortisone 100mg TDS \* 8 days  
TAB Pan 40 mg OD  
SYP cheston plus 10ml BD  
Nebulization with salbair 1 TDS  
Nebulization with budate BD

### **Chest expansion:**

At axillary level: 2 cm  
At nipple level: 2 cm  
At xiphisternum: 3 cm

**Investigations:**

1. **CBC**- Haemoglobin reduced, eosinophil increased
2. **ESR**- 56
3. **KFT**- normal
4. **LFT**- normal
5. **PFT**- Peak expiratory flow rate decreased

FEV1/FVC- 20%

PaO<sub>2</sub> decreased and PaCO<sub>2</sub> increased

6. **Chest (CT scan)** - Normal lung parenchyma without bronchiectasis or scarring

**Evaluation:**

The lower extremity and upper limb range of motion and strength of the patient were sufficient. The patient can perform her activities of daily living such as dressing, bathing, toileting, eating, combing etc. but she was not able to talk for a long time as she use to feel breathless.

**Diagnosis:** The patient was diagnosed with bronchial asthma.

**Therapeutic intervention:**

Short-term goal was to relieve shortness of breath, decrease pain, increase peak expiratory flow, improve breathing, reduce use of accessory muscle and promote relaxation. Long- term goal was to improve strength and endurance, improve quality of life of the patient and prevent symptoms to reoccur. When the patient was referred to physiotherapy she was first taught diaphragmatic breathing exercise with relaxation of the upper chest while bronchodilator therapy was being administered. To relieve bronchospasm bronchodilator was the first need it was administered by inhalation of Salbair 1 TDS and Budate BD which is a nebulised fluid using nebuliser and a face mask.

After one day the patient was able to breathe easily, at this stage effective huffing using forced expiratory technique (FET) was taught. Periods of relaxed diaphragmatic breathing was being done. Gentle vibration of the chest on expiration was carried out in high side lying position. Along with gentle vibration, gentle rhythmic percussion was given to gain relaxation and aid expectoration after this the patient was allowed to rest in a relaxed high side lying position. In order to avoid use of accessory muscles of respiration and to avoid slouching position proper positioning, using the support of pillows in side lying position was given. The patient was also advised to sit in forward lean position so that she could gain relaxation of the upper chest and shoulder girdle muscles. Also teaching appropriate relaxation position is helpful in overcoming mild attack of wheezes.

Formatted: Font color: Red

To improve chest expansion thoracic expansion exercise was taught to the patient. Breathing control was also taught to the patient so that the patient can breathe effectively. As bronchial secretion was present chest clearance programme i.e postural drainage was included in the treatment programme. Vibration and shaking of the chest wall was being carried out in a position which was comfortable to the patient. Along with diaphragmatic breathing exercise pursed lip breathing technique was also taught to the patient each breathing exercise consisted of 6-7 repetitions.

After 6 weeks of physiotherapy programme along with medications there was decrease in symptoms, improvement in the clinical control of asthma and quality of life of the patient.

After complete treatment pulmonary function test was done again which showed increased peak expiratory flow.

After the treatment the patient was given a home programme which included breathing exercises, walking for at least 30 min daily. Patient was educated about symptoms, breathing technique and appropriate living environment and to reduce exposure to biomass.

#### **Follow up and outcome:**

Patients were again asked to provide follow-up after 12 weeks and physical examination was carried out but mild problems were seen and recorded. After 6 weeks treatment, she was able to do household work. After 8 weeks treatment, she was able to work in the farmer without dyspnoea or chest pain or a feeling of fatigue. At that point, the functional rehabilitation was completed. The result was MMRC grade 0 at the end of the recovery period. Increased peak expiratory flow. Her breathing pattern was normal. Chest pain was not present at all. There was no tenderness. Cough and secretions was not present.

With no episodes of dyspnoea or chest pain, the patient was able to perform all her daily life activities.

#### **Discussion:**

Severe asthma could be difficult to manage. Patient suffering from asthma require an extensive work, but several medications are currently available to aid in the management and new treatments continue to arise. (5,6) Thus, handling extreme asthma requires knowledge of the options available, as well as consideration of the personal situation of the patient, both in terms of the phenotype of the disorder and individual preference(7). In this case study, the 6 weeks chest physiotherapy programme enhanced clinical regulation of asthma and quality of life and reduced symptoms of the patient. The parameters of spirometry remained unchanged, the daily peak flow values increased and the intake of salbutamol decreased. Subjectively, we observed in our clinical experience that breathlessness triggered a shift in the quality of life of asthmatics, including a high degree of attention loss and a sense of hopelessness with respect to their disease prediction(8,9). In addition, patients could learn about conscious control of breathing in order to address psychological aspects. And some recent publications on chest physiotherapy, and asthma have shown that there is a theoretical basis for a more structured treatment strategy.(10-12)

This case study analysis showed an improvement in peak flow values and a decline in the intake of salbutamol in patients undergoing physiotherapy. These findings are consistent with those of other studies which show a successful reduction in symptoms, frequency of attacks with physical therapy. The benefits observed in 6 weeks of this study allowed monitoring over a longer period of time and were consistent(13-16).

#### **Conclusion:**

This case study showed that breathing exercise, postural drainage and proper relaxation of the patient may reduce the symptoms associated with bronchial asthma also the peak flow values may increase with breathing retraining. Pain reduces with reduction in cough and episodes of dyspnoea. Also educating the patient about prevention of asthmatic episodes help the patient in many ways. Along with bronchodilators physiotherapy plays an integral part in treating the patient with bronchial asthma.

#### References:

1. PATRICIA A. DOWNIE. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists. 4th ed. 458–535 p.
2. Alderson M, Loy RM. Mortality from respiratory disease at follow-up of patients with asthma. *Br J Dis Chest*. 1977 Jul;71(3):198–202.
3. Jr, B. F. P. ., & Federico R. Tewes. (2021). What attorneys should understand about Medicare set-aside allocations: How Medicare Set-Aside Allocation Is Going to Be Used to Accelerate Settlement Claims in Catastrophic Personal Injury Cases. *Clinical Medicine and Medical Research*, 2(1), 61-64. <https://doi.org/10.52845/CMMR/2021v1i1a1>
4. Speizer FE, Doll R. A century of asthma deaths in young people. *Br Med J*. 1968 Jul 27;3(5612):245–6.
5. Asthma [Internet]. Physiopedia. [cited 2020 Dec 5]. Available from: <https://www.physio-pedia.com/Asthma>
6. Jennifer A Pryor, Barbara A Webber. Physiotherapy for Respiratory and Cardiac Problems.
7. Daniel, V. ., & Daniel, K. (2020). Diabetic neuropathy: new perspectives on early diagnosis and treatments. *Journal of Current Diabetes Reports*, 1(1), 12–14. <https://doi.org/10.52845/JCDR/2020v1i1a3>
8. Goyal C, Naqvi W, Sahu A. Xia-Gibbs Syndrome: A Rare Case Report of a Male Child and Insight into Physiotherapy Management. *Cureus* [Internet]. [cited 2021 Mar 14];12(8). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7478925/>
9. Goyal C, Naqvi WM, Sahu A. An atypical case of febrile infection-related epilepsy syndrome following acute encephalitis: impact of physiotherapy in regaining locomotor abilities in a patient with neuroregression. *Pan Afr Med J* [Internet]. 2020 Jun 17 [cited 2021 Mar 14];36. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7392866/>
10. Daniel, V., & Daniel, K. (2020). Perception of Nurses' Work in Psychiatric Clinic. *Clinical Medicine Insights*, 1(1), 27-33. <https://doi.org/10.52845/CMI/2020v1i1a5>
11. Wane M, Naqvi WM, Vaidya L, Kumar K. Kinesiophobia in a Patient With Postoperative Midshaft Fracture: A Case Report of Its Impact on Rehabilitation in a

16-Year-Old Girl. Cureus [Internet]. 2020 Nov 5 [cited 2020 Dec 11];12(11). Available from: <https://www.cureus.com/articles/42869-kinesiophobia-in-a-patient-with-postoperative-midshaft-fracture-a-case-report-of-its-impact-on-rehabilitation-in-a-16-year-old-girl>

12. Vaidya L, Kumar K, Naqvi W, Narang S, Pisulkar G, Dadlani M. Revision of total hip replacement surgery in elderly patient and its recovery based on periprosthetic fracture rehabilitation. 2020;11.
13. Laurino R, Barnabé V, Saraiva-Romanholo B, Stelmach R, Cukier A, Nunes M. Respiratory rehabilitation: A physiotherapy approach to the control of asthma symptoms and anxiety. *Clin São Paulo Braz*. 2012 Nov 1;67:1291–7.
14. Abbafati, C., D.B. Machado, B. Cislighi, O.M. Salman, M. Karanikolos, M. McKee, K.M. Abbas, et al. “Five Insights from the Global Burden of Disease Study 2019.” *The Lancet* 396, no. 10258 (2020): 1135–59. [https://doi.org/10.1016/S0140-6736\(20\)31404-5](https://doi.org/10.1016/S0140-6736(20)31404-5).
15. Daniel, V., & Daniel, K. (2020). Exercises training program: It’s Effect on Muscle strength and Activity of daily living among elderly people. *Nursing and Midwifery*, 1(01), 19-23. <https://doi.org/10.52845/NM/2020v1i1a5>
16. Abbafati, C., D.B. Machado, B. Cislighi, O.M. Salman, M. Karanikolos, M. McKee, K.M. Abbas, et al. “Global Age-Sex-Specific Fertility, Mortality, Healthy Life Expectancy (HALE), and Population Estimates in 204 Countries and Territories, 1950–2019: A Comprehensive Demographic Analysis for the Global Burden of Disease Study 2019.” *The Lancet* 396, no. 10258 (2020): 1160–1203. [https://doi.org/10.1016/S0140-6736\(20\)30977-6](https://doi.org/10.1016/S0140-6736(20)30977-6).