

Steroid-Sparing Diet and Lifestyle for Severe Asthma and Interstitial Lung Disease

Prashanth Thalanayar Muthukrishnan*

Department of Pulmonary and Critical Care Medicine, Albert Einstein College of Medicine, Jacobi Medical Center and North Central Bronx Hospital, Bronx, NY, USA

***Corresponding Author:** Prashanth Thalanayar Muthukrishnan, Department of Pulmonary and Critical Care Medicine, Albert Einstein College of Medicine, Jacobi Medical Center and North Central Bronx Hospital, Bronx, NY, USA.

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Abstract

With the worldwide progression of asthma and interstitial lung disease in severity and prevalence, there is increasing need for newer concepts and therapies. The author reports existing evidence behind anti-inflammatory, anti-oxidant and steroid-sparing effects of a set of natural dietary and lifestyle modifications, especially, adding triphala in warm water (fruit powder) to the daily routine. A case is presented to exemplify the concept behind the integrative pulmonary technique adapted herein.

Keywords: Asthma; Interstitial Lung Disease; Triphala; Integrative Pulmonary; Warm Drinking Water Practice

Abbreviations

IgE: Immunoglobulin E; ILD: Interstitial Lung Disease; FEV1: Forced Expiratory Volume in 1 Second; FVC: Forced Vital Capacity; TLC: Total Lung Capacity; DLCO: Diffusion Lung Capacity for Carbon Monoxide

Introduction

Asthma is predominantly a T helper cell- type 2 mediated inflammation that is potentiated by eosinophil and IgE-mediated pathways. Various phenotypes are described in severe asthma that arise from an array of genetic and epi-genetic influences [1]. There is a tremendous growth in the field of biologic therapies for severe asthma that has expanded the armamentarium beyond inhaled steroids and bronchodilators [2]. Simultaneously, complementary and alternative medicine specialists have documented lifestyle changes and natural dietary supplements that constitute practice-based evidence for useful asthma therapy [3]. Specifically, for instance, according to a Washington University-STL study, a combination of 3 balancing fruits, also known as triphala (tri-meaning 3 and phala meaning fruits), has been shown to alleviate bronchial hyperreactivity in asthma mouse models through liver and spleen immunomodulation and increased anti-oxidative effects [4]. The origins of triphala fruit trees trace from the Indian subcontinent and China, where the species are widespread [5]. Similar to asthma, there is developing literature on anti-inflammatory effects of triphala in the realm of autoimmune disease [6,7]. The increasing awareness of ayurvedic diagnostic approach (such as prakriti analysis) in the western hemisphere arises from the validation received through genome-wide sequencing research. Briefly, ayurvedic principles describe the human body on the basis of proportions of the five elements of nature - air, space, water, fire and earth. The diversity of humans arises from the variation of proportion of combinations of air-space (vatta), fire-water (pitta) and water-earth (kapha) [8].

We report a case of severe asthma that did not respond to standard of care bronchodilators, anti-histamines, continuous prednisone in doses greater than 20 mg daily for more than 3 years with intermittent steroid bursts. The patient was in our hospital system under

various pulmonary specialists since 2006; the author had first contact with patient in 2018 since July and was able to access records from as early as 2006. The author has unique access to resources from multiple cultural backgrounds of medicine and healthcare including integrative medicine, reiki, yoga, ayurveda (Indian), chinese and south-american traditional medicine, mindfulness, naturopathy. We report striking resolution of asthma symptoms since introducing 2 key aspects amongst many natural gut- and lung-healthy food and lifestyle practices.

Case Presentation

38-year-old morbidly obese female (BMI 56) with h/o severe persistent asthma (onset since childhood) with best peak flow of 300L/min (pre-bronchodilator), interstitial lung disease (ILD) related to mixed connective tissue disease, fibromyalgia, hypertension, diabetes mellitus presents for follow up in asthma clinic. Triggers include carpet/dusting, cold weather, hot humid weather, cigarette smoke, cleaning agents. She was a remote smoker of 10 pack years duration and quit in 2005. Physical exam revealed Vitals: Temp: 98.0F, PR: 116, RR: 18, BP: 144/92 mm of Hg, weight: 304 lbs. Head and neck: no lymph nodes, no pallor/icterus, nasal turbinates erythematous. Cardiovascular: tachycardia, normal S1 S2, no murmur. Chest: End expiratory wheeze. Abdomen: soft, obese abdomen, Non tender. Extremities: no edema. SKIN: has facial scabs. CN: AO x 3, no focal deficit. Ayurvedic pulse exam as mentioned below in methods.

She was seen in our clinic since 2006 and progressed from intermittent asthma to severe persistent asthma with use of albuterol nebs > 4 - 6 times a day as needed, nightly symptoms, continuous daily symptoms. Her symptoms were so severe that 2015 was the last time she could perform a PFT. FEV1 42% FVC 45% Ratio 79, with non-significant bronchodilator response FEF 25 - 75% was very low - 37% predicted TLC 70% DLCO mildly reduced, ERV was severely reduced. Flow volume loops showed expiratory scooping and narrow loop. Obesity, severe long-standing asthma and interstitial lung disease were thought to explain the physiological defects seen on PFT. Peak flow values ranged from 150 to 280 L/min over 12 years of clinic and ER visits. She had very limited exercise tolerance (< 100 - 200 yards) MMRC grade 4.

Medication list included Albuterol and Ipratropium Nebulization solution and MDI as needed, Cetirizine 5 mg, Montelukast 10 mg, Losartan 25 mg, Metformin 1000 mg, Plaquenil 200 mg, Gabapentin 600 mg. She felt better after the nebulizer treatments for the subsequent 3 - 4 hours and required more treatments. Inhaler technique was corrected and the team also attempted Fluticasone-furoate and vilanterol (breo ellipta 200/25 mcg) instead of budesonide/formoterol (160/4.5 mcg) and beclomethasone (80 mcg) to see if mode of delivery had an impact. Besides these, tiotropium bromide (18 mcg) and umeclidinium (62.5 mcg) options were attempted at different intervals during the course. She was seen by rheumatology clinic and allergy clinic simultaneously. She had been on hydroxychloroquine for her ILD from MCTD. Patient had refused to take other immunosuppressants after having experienced side effects from azathioprine and methotrexate. Allergist performed skin testing- positive for dust mite, dog, cockroach. Total IgE was 52 IU/ml. Eosinophil count on peripheral blood: 0.31/nl. Patient's nasal disease regimen was optimized with nasal flonase. Plan was to attempt a prescription for biologic such as benralizumab. However, when the author's pulmonary team met the patient in 2018, we undertook a detailed assessment of her whole body symptomatology and her diet and lifestyle. While awaiting authorization for biologics, we began introducing aspects of lifestyle and integrative medicine as below.

Methods and therapy

Based on Indian/South-east Asian traditional ayurvedic medicine diagnostics, patient met criteria for kapha-predominant prakriti or baseline constitutional type. Also, imbalances were found to predominate in the kapha and pitta dosha based on history eliciting and pulse exam (superficial and deep palpation). Patient reported liking towards ice cold drinking water, soda, cheese, bread etc. Her consumption of herbs and spices was minimal. She had almost doubled her weight in 2018 compared to 2006 despite not having a big appetite. She complained of having sluggish digestion where she could easily skip meals without problems. Mucus production, cough, facial acne/rash and severe dyspnea on exertion persisted. She had multiple exacerbations with prednisone therapies that worsened her weight gain. Patient's joint pains relating to mixed connective tissue disease were only fairly controlled with hydroxychloroquine and gabapentin.

The changes that were introduced into her daily routine since Feb 2019 included:

- Add a natural dried fruit powder named Triphala to the diet (consumed with warm water).
- Restrict drinking water to lukewarm water or hot water rather than ice cold water.
- Start the day with lemon or lime squeezed in warm water.
- Sip water few ml at a time and not to swallow without mixing with saliva.
- Chew, chew and chew the food you eat.
- Be mindful while cooking and eating so as to pay complete attention to the process of chewing, swallowing and digesting food.
- Optimize the amount of green, yellow, red, and similar colourful vegetables and fruits in the diet preferably from the local farmers market.
- Consume warm vegetable puréed/blended soup with added herbs and spices to simplify digestive workload.
- Optimize the use of herbs and spices in the diet including cumin seeds, cilantro seeds, black pepper, long pepper, moringa (drum-stick), turmeric, fennel seeds, garlic, ginger in moderation.
- Boil cumin, cilantro and fennel seeds in hot water and consume in the morning.
- Consume self-cooked food rather than commercial food.
- Balancing the diet with all 6 tastes - sweet, sour, bitter, salty, astringent, pungent.
- Initiate relaxation and mindfulness meditation for 5 minutes in the morning and evening (taught as an act of simple observation of thoughts and breathing patterns by the author).
- Gentle rebounding with trampoline or similar rebounding surface 5 min twice a day.
- Referral to educational resources including Ann Wigmore natural health, The Prime by Kulreet, Dean Ornish, Everyday Ayurveda, Benefits of Rebounding exercise.

Results

Patient started practicing aspects of the above lifestyle changes subsequently and over 2 months duration demonstrated significant increase in peak flow values reaching as high as 340 and later 380 L/min which is her new best over 13 years, independent of body weight changes. The patient's need for albuterol and ipratropium has come down to once a day as empiric dose before going to bed and exercise tolerance has improved to MMRC grade 2 and her obesity still is contributing to much of her work of breathing; denies cough, wheezing and asthma attacks. The patient wanted to completely come off of prednisone, however, the author recommended she slowly taper off. Her current dose is 2.5 mg daily and she will come off of it in the next week. Patient used to visit ER every few days for steroid bursts and now she has had no ER visits since April 2019.

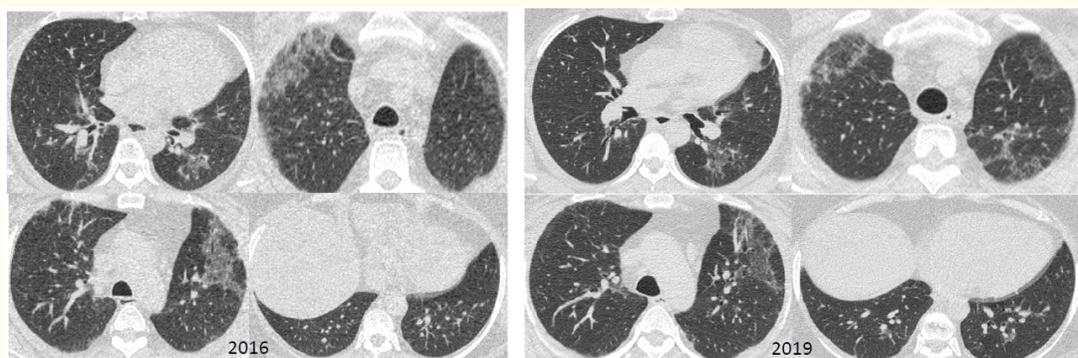


Figure: CT scan images from 2016 (left) and 2019 (right) showing ground-glass opacities, septal thickening, no basal honeycombing. Minimal change noted over 3 years.

Trend of asthma control test scores, body weight and peak flow measurement

Year	Asthma control test score	Peak flow - best (l/min)	Body weight
2006	20/25	300	77 kg
2011	18/25	250	107 kg (pregnancy)
2015	14/25	280	118 kg
2017	10/25	290	139 kg
2018	14/25	275	130 kg
2019 july	20/25	340 and 380	138 kg

Table**Discussion**

Severe asthma, obesity and interstitial lung disease are 3 diseases that contribute to a significant proportion of healthcare expenditure and quality of life worldwide. It is essential that we understand the right distinction between incorporating lifestyle/dietary changes versus supplementing with alternative medicine therapies. The need for evidence behind complementary therapies arises because of unfamiliarity to certain practices and the lack of awareness of the risks or side effects. Evidence based medicine has its own implications, and there is ongoing off-label use of drugs without FDA approval or randomized controlled trials (RCT) despite black-box warnings [9]. Hence, we need a thorough assessment of benefits and risks for any health intervention before implementation. There is an increasing interest in publishing clinical research on herbs and spices in medicine and this could motivate herbal/spice industries to fund randomized controlled trials. For instance, the cost of 1 oz. Triphala powder or capsule form ranges between 10-15 dollars since it is imported from the subcontinent. Pharmaceutical companies may be a potential driving factor in future research only if interest in such herbal products (as capsules) is made financially rewarding.

Our patient has not lost any weight so far. She is likely to lose weight soon given the significant drop in steroid use. There is evidence behind accumulation of "Ama" or toxins as a prime factor leading to obesity [10]. The patient has not yet optimized the use of cumin, cilantro and fennel seeds (also called CCF or prime tea) in hot water and this has shown to be a potent regimen that causes spontaneous weight loss from strengthening the digestive enzyme system. Gut integrity plays a major role in autoimmune disease and allergic disorders including atopy and asthma [11]. The role of triphala, warm drinking water practice, optimizing digestion with herbs and spices according to individual prakriti - aka. personalized medicine in modern medicine, has already been established [12]. Other resources including Dr. Ann Wigmore's food combining methods and natural gut-healthy practices have been documented as practice -based evidence and not as evidence-based medicine [13]. Most of traditional and complementary medicine has been documented as practice based evidence. There is recent interest in finding a bridge between evidence based medicine and practice based knowledge [14]. The author reports a similar case record of a patient with Asthma-COPD overlap syndrome with significant obstructive ventilatory defects on PFT that responded well to the integrative pulmonary protocol mentioned above. Such case series and registries documenting evidence behind natural pharmaceutical therapies will be the future of medicine.

Conclusion

This publication summarizes existing evidence for therapeutic effects of established dietary and lifestyle supplements that may have a role in asthma and interstitial lung disease. The author exemplifies the same in the form of a real-life patient case record with objective data to show steroid-sparing effects of the overall protocol and especially triphala. Such case series will motivate integrative medicine institutes nationwide to undertake prospective and randomized controlled trials to establish the efficacy based on 21st century research standards.

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