Validating The Siddha Text Balavagadam On The Symptomatology Of Suzhi Kanam With That Of Childhood Asthma

G.Sivapalan [1], Rajantheran Muniyandy [2] S.Manimaran[3]*, Silllalee S. Kandasamy [4], Jeeva Gladys[5]

[1*] Senior Lecturer, Department of Indian Studies, University of Malaya, 50603 Kuala Lumpur, Malaysia.

[2] Professor, Dr., Department of Indian Studies, University of Malaya, 50603 Kuala Lumpur, Malaysia.

[3*] Senior Lecturer, Dr., Department of Indian Studies, University of Malaya, 50603 Kuala Lumpur, Malaysia.

[4] Senior Lecturer,Dr. Department of Indian Studies, University of Malaya, 50603 Kuala Lumpur, Malaysia.

[5]Reader, Department of Research methodology and medical statistics, Velumailu Siddha medical college, Sriperumbudur-602105.

Corresponding author

S.Manimaran
Senior Lecturer, Dr., Department of Indian Studies, University of Malaya, 50603 Kuala Lumpur, Malaysia.

Abstract

Siddha system of Medicine is unique and is perpetuating for centuries because of its merits. According to *Siddha* concept, disease is caused when the normal equilibrium of three humours (*Vatham, pitham and kabam*) is derranged. The factors which affect this equilibrium are environment, climatic conditions, diet and physical activities. "*Kuzhanthai Maruthuvam*" is one among the branches of *Siddha* system which deals with Paediatric health issues and lays the basement for a healthy society. This review of literature focuses on validating the Siddha text *Balavagadam* which is an exclusive text compiling paediatric diseases in termsof its management and prevention. A spotlight has been shed on *Suzhi kanam* one among the 24 types of *kanam* (Paediatric respiratory disorders).The signs and symptoms have been analysed and compared scientifically with contemperory paediatric literature. Upon keen understanding of its symptomatology and the various etiology it has been found to be well correlated with childhood asthma. This article also interestingly reveals the scientific exploration of Siddha literature on the progression of *Mantham* (gastrointestinal disorders) to*Kanam* (respiratory disorders) and *Karapaan* (Skin disorders) akin to allergic and atopic diseases.

Key words: Siddha, Childhood asthma, bronchial asthma, *Kanam, Mantham, Karapaan*

Article Received: 18 October 2020, Revised: 3 November 2020, Accepted: 24 December 2020

Introduction

There is always a science behind the philosophies of ancient Siddha system. This medical system lays emphasis for a perfect living, from birth to death. Today's children are the future citizens of a nation.[1-2] To have a better nation, healthy citizens can contribute a lot. The Siddha text *Balavagadam* is an exclusive compendium of Paediatric illness which includes the growth and development of children at different stages of life, the expected health issues during their childhood and its management.[3] Specific Siddha drug

formulations exclusive for Paediatric usage have been well documented in this Siddha text and is widely practiced by Siddha Paediatricians (*Kuzhanthai maruthuvargal*) to combat common childhood diseases and disorders. Hence "*Balavagadam*" is the branch of medicine dealing with the care of infants and children through Siddha way.[4] This Siddha text *Balavagadam* also deals with the etiopathogenesis of diseases right from intra uterine life to genetic traits of children due to parental diet and lifestyle and the influence of maternal diet during antenatal and post-natal period on the health status of her offspring.

Childhood Asthma-Contemperory perspective

Asthma is characterised by increased responsiveness of trachea bronchial tree to a variety of stimuli resulting in widespread narrowing of air spaces. The cause of Childhood Asthma isa combination of inherent biological and genetic vulnerabilities and it is encountered by a large population of children today. Extrinsic asthma which is Ig E mediated caused by allergens plays a significant role in the pathogenesis of Childhood asthma.[5] Genetic factors play a contributing role in the pathogenesis of asthma. Molecular genetic linkage studies indicate the genetic linkage of asthma to chromosome 12q was followed by single-locus confirmatory studies.[6] The allergic cytokines are IL 3, 4, 5,9,13 and granulocyte macrophage colony stimulating factor. All these are linked to the inheritance of an increased IgE response and increased bronchial hyper responsiveness. The other factors for the cause of childhood asthma are Common respiratory viruses (Respiratory syncytial virus, rhinovirus, influenza, parainfluenza etc), Inhaled allergens, chemical and biological air pollutants, emotional stress, exercise and weather change. Extrinsic asthma which is IgE mediated caused by allergens plays a significant role in the pathogenesis of Childhood asthma. The non IgE mediated intrinsic asthma is triggered by infection. [7]

SCIENTIFIC ANALYSIS OF ETIOGENESIS OF KANAM ACCORDING TO BALAVAGADAM TEXT

Siddha literature explains the etiogenesis of *Kanam* as subsequent to *Mantham* (gastrointestinal disorders), *Karpachoodu* (Conceptional heat), Antenatal, postnatal and environmental factors.

***1.* Etiogenesis of *Kanam* subsequent to *mantham*[4]**

According to *Siddha* literature, *Mantham* is a "*Palparuva Noi*" occuring during 1-3 years of life. Which is quoted as,"*Aandondrai thottey agal moondraa maandalavum Thaandumey maantha noi*"-*Balavagadam*."*Thaandumey mantha noi*" which means if gastro intestinal disorder(*Mantham*) occurs repeatedly for 1-3 years and is not treated properly it persists and matures inside the body and it is followed as *Kanam*, which is a predominant respiratory disorder.

-

"Annamum paalum neiyum Azhugiya pazhamum thenghaai
Pinnaiyum kadalai vellam Periyathor kathali pandum
Thinnumor kaalanthannil Theeyena vethumbu maagil
Ondruru pillaikku than

Uvanthumey maantha mundaam"

-Balavagadam

Hence from the above literature evidence in *Balavagadam*, it is clear that inclusion of certain food items such as rice(*Annam*) in addition with milk(*Paal*) and ghee(*Nei*), rotten fruits(*Azhugiya pazham*), coconut(*Thenghai*), certain nuts(*Kadalai*), jaggery(*Vellam*), ripe banana(*Kathali Pandu*) in a mother's diet is a major and significant cause for the development of *Mantham* in breast fed infants. Therefore it can be concluded that persistence of *mantham (gastro intestinal illness)* may lead to *kanam (respiratory illness)*. According to modern concept, Ingestion of certain foods like Cow's milk, Pea nut, soya, egg and certain proteins may cause allergic reaction to the

lactating mother with a rise in serum IgE.[8] The high levels of IgE in the lactating Mother is transmitted to the child leading to Atopic disease in the child such as asthma and skin diseases.[9] Moreover, dietary influences in early life, shape the plasticity of the immune system and food sensitivity is an important factor in the development of allergy in the first 1-3 years of life. Food allergy is a group of disorder in which symptoms result from immunologic response to specific food antigen in children during 1-3 years of life.[10] Therefore these scientific facts substantiate the ancient literature

concepts that persistence of *Suzhi mantham* one of the types of mantham may lead to *Suzhi kanam*.

2. Etiogenesis of kanam due to karpachoodu (conceptional heat)[4]

"*Thogaiyaana kanangal yellaaam karpachoodu*"

- *AyothidhasarBalavagadam.*

"*Sukkilathil suronotham kalakkumandru Poonthidum viyaathi moondrum*"

- *Dhanvandhiri naadi*

Here "*Karpachoodu*" Parallells with the concept of "Genetic basis of Atopic diseases" whichis well explained n the second poem that evolutiuon of disease begins during the fertilization of ovum(*Sukkilam*) and Sperm (*Suronitham*). Siddha Medicine aims at healthy germs (Quality unicellular Sperm and Ovum) which yields healthy generation or off springs. The food and health wise practices of different community people of Tamilnadu during menarche and puberty are aimed at quality ovum. Hence the Maternal and Child care Management goessimultaneously hand in hand with each other.

3. **Etiogenesis of kanam due to maternal and environmental factors[4]"** *Iyyathu koodi trendaal*
Arivaiyar thuyaram thannaalSeyya parpunal arunthi
Seri sala thodam thannaal
Payyara valgullaalum
Pasiyudan iruthal laalum Thuyyathor kuzhavigatku Kanangalum thondrum andrae".

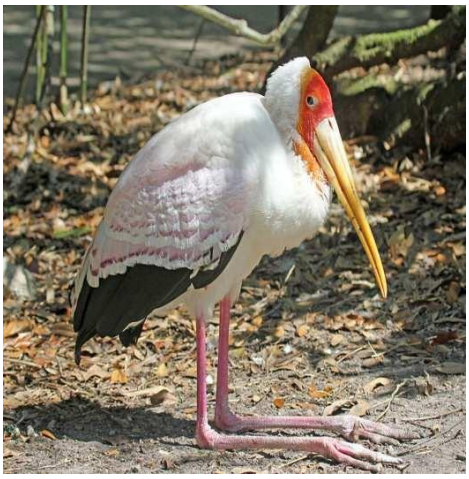
In this Poem,"*Iyyathu kooditrenraal*"refers to increased kabam humour in the body which is responsible for excess mucous production."*Arivaiyar thuyaram, pasi yudan iruthal*"refers to Hunger,Anxiety and depression in lactating mothers. **"***Salathodam*" refers to polluted water used for drinking and bathing which is the major cause of infections.[1]The risk of allergic diseases in a child approaches 50% when one parent is allergic and 66% when both parent are allergic. Atopic diseases have a strong familial predisposition with 60% heritability in twin studies of Asthma and Atopic dermatitits.The genetic defects affecting one or more arms of immune system result in primary immune deficiencies and the affected child may not be able to contain the pathogen or develop and immune response to prevent recurrence.[11]Moreover, hunger, Anxiety, depression in a lactating mother causes a reduction

in the secretion of oxytocin which impair milk ejection reflex resulting in deficient feeding, immune deficiency and allergic responses[12].

PARALLEL ANALYSIS OF SYMPTOMS OF *SUZHI KANAM* WITH THAT OFCHILDHOOD ASTHMA

Symptoms of *Suzhi kanam*	**Symptoms of Childhood asthma**
Irumal, Suvasam suzhithu velivaral (difficulty in expiration)	Cough,Prolonged expiration and expiratory wheeze
Vaanthi (Vomiting)	Mechanical vomiting due to severe cough.The vigorous contractions of abdominal muscles and diaphragm that occur during severe coughing may result in vomiting
Paalunnamai (feeding refusal)	Nasal obstruction and breathing difficulty, interferes with feeding
Kann panchadaithu kanal (fatigue eyes)	Tried looking eyes due to repeated night awakening due to cough and breathlessness
Nuraieral,nenju,thondaipunnathal (inflammatory changes)	Inflammatory changes due to chronicpresistent cough and breathing difficulty
Vairu nothal (abdominal discomfort andpain)	Abdominal bloating and discomfort due to mouth breathing. Asthma itself able to induce Gastro intestinal symptoms such asabdominal distension due to aerophagia.
Nenju erichal (retrosternal burning)	Sour eructations in the esophagus and heart burn due to GER. This is due to the Increase in transdiaphragmatic of pressure that increases the prevalence of
	symptomatic GER in 70% of asthmatics
Udal kundri pothal(growth retardation)	Stunted growth and poor weight gain in children with recurrent respiratory tract infections.

Suram, santhu nothal (fever,joint pain)	Fever and associated symptoms may accompany asthma, as asthma is commonly provoked by viral infections and Upper respiratory tract infection inchildren.
Mugam,marbu,kandam pudaithu kana(facial puffiness,chest protrusion)	Increased Anterio posterior diameter of chest - Sign of Acute severe Exacerbations of Asthma.
Kaai,kaal kuliral(cold extremities) *Naavaralum*(dry tongue)	Altered sensorium Drying of lips from continuous mouth breathing
*Naasi edutherium (*Nasal Flaring)	Nasal Flaring – a Manifestation of respiratory distress in severe exacerbation.
Maiyakam, thalainothal,kann sorugal (symptoms of hypoxia)	Coma / Semicoma, Confusion, Headachedue to Hypoxia
*Mugam manjalithal (*Facial pallor)	Facial pallor due to hypoxia
*Ucchi kulliviluthal (*Depression of anterior fontanelle)	Depression of anterior fontanelle indicating the serious condition of infant due to exacerbation of the disease
*Kozhai nuraiyum (*frothy mucus*)*	Excess mucus production and inflammatory exudate in the airways
" *Naarai pol thuvalal*" (Easy fatiguability like stroke)	They are long and thin legged birds with long neck. They communicate by weak moans orgrunts as they lack a voice box. They walk slowly and make short distant movements.

(Naarai – Stroke) 	They sleep on standing with neck bentback on its head resting between its shoulders This can be compared with elevated shoulder and hunch back positionadopted due to airway obstruction. Also, the anterior flexion of head during inspiration known as 'Head bobbing' can occur in asthmatic infants, which is a feature present in storks and few other birds. Their Beaks remain partly open most of the times which can be compared with 'Mouth Breathing'

Scientific exploration of the *Balavagadam* Poetic lines

1. Irumal (Cough) and Suvasam suzhithu velivaral (Difficulty in expiration):

Cough is one of the unchangeable and significant factor for asthma in general. Especially when triggered with environmental allergens, dust mites, exercise, respiratory infections, irritants, cold air and other stimuli. These factors can raise the levels of histamines, leukotrienes, cytokines, prostaglandins resulting in inflammation, excess mucus secretion, bronchospasm, increased vascular permeability, obstruction of airway smooth muscle which is characterised as cough, wheezing and difficulty breathing in asthma.[13-15]

2. Vaanthi (Vomiting):

In Asthma T lymphocytes play a major role in bronchial inflammatory responses. Studies were conducted to understand the association of asthma with gastrointestinal disturbances. The inflammatory cells, lymphocytes are capable to migrate from bronchial mucosal lymphoid tissue to intestinal mucosa and can cause abnormalities in the digestive barrier. Another possibility for gastrointestinal complaints or vomiting may be due to inhalation of certain allergens. [16, 17]

3. Paalunnamai (Feeding Refusal):

Feeding in children may require coordination of sucking, swallowing and breathing. In asthma children who suffer from cough or airway obstruction or wheezing breathe through their mouth, suffer feeding difficulties. This results in feeding refusal.[18]

***4. Kann panchadaithu kanal* (Fatigue eyes):**

Sleep apnoea is one of the symptoms of asthma irrespective of its severity. Breathing disorders during sleep may result in unrefreshing sleep, day time sleepiness and fatigue. This results in reduced sleep during night and fatigue eyes. Certain allergens are also responsible for fatigue eyes.[19]

5. Nura ieral , nenju, thondai punnathal (Inflammatory changes):

The nature of inflammation in asthma is chronic and progressive. A cascade of events

take place when the inflammatory cells react with resident cells. This further causes air way smooth muscle contraction (bronchoconstriction), airway oedema, inflammation in bronchial epithelium, narrowing of the airway, defects in mucosal lining as a whole.[20]

6. Vairu nothal (abdominal discomfort and pain):

Literature shows a strong association between asthma and functional abdominal pain disorders. The increased inflammation in asthma increases number of T lymphocytes, eosinophils, mast cells in the overall mucus lining (both in respiratory and gastrointestinal lining simultaneously). This results in abdominal pain, functional dyspepsia, abdominal migraine and bloating. Studies detected increase in number of inflammatory cells and immunological reactions in bowel biopsy specimens of asthmatics.[21]

7. Nenju erichal (Retrosternal burning):

Although these mechanisms have to be adequately studied, literature evidence demonstrates the following hypothesis. Bronchial obstruction leads to air trapping in the chest, increases negative pleural pressure and increases the pressure gradient across the diaphragm. This weakens the anti-reflux barrier favouring gastroesophagal reflux.[22]

8. Udal kundri pothal (Growth retardation):

Several factors like early onset of the disease, severity, hypoxemia, socioeconomic factors, chronic anorexia, chest deformity, medications like corticosteroids and duration of the disease are most likely responsible in growth delay and retardation in asthmatic children.[23]

9. Suram, santhu nothal (Fever,joint pain):

Bacterial infections are one the main reasons in acute exacerbations of asthma. Bacterial and viral infections are associated with fever and body pains. Studies have shown that chronic asthmatic patients exhibit symptoms like joint pains, low social function and disturbances in mental health.[24, 25]

10. Mugam, marbu, kandam pudaithu kana (Facial puffiness,chest protrusion):

In asthma, due to bronchoconstriction the efforts to inhale each breath is increased. The increase in efforts during inhalation and slow exhalation of the inhaled air takes place. Before all the air is exhaled from last breath, one may initiate the next breath. Then the volume of air in the lungs and chest wall increases. This results in hyperinflation of the lungs and chest wallprotrusion.[26]

11. Kaai, kaal kuliral, Maiyakam, thalainothal,kann sorugal (Cold extremities)

Studies have documented that mental agitation, drowsiness, confusion, ability to speak, activity level were also altered featuring cerebral hypoxemia in case of severe asthma.[27]

12. Naavaralum (Dry tongue):

Asthma also exhibits symptoms like alteration of salivary composition, reduced salivaryflow, mouth breathing and dry tongue due to immunological and inflammatory responses in the body.[28]

13. Naasi edutherium(Nasal flare)

Clinical manifestations of acute exacerbations of asthma include respiratory distress, nasal flaring, paradoxical thoraco-abdominal movement and also involvement of accessory muscles.[27]

14. Mugam manjalithal (Facial pallor)

As hypoxia is one of the clinical manifestations in severe asthma appearance can be pallor Cognitive impairment and CNS depressant effects are also seen.[29]

15. Kozhai nuraiyum (Frothy mucus)

On repeated exacerbations of asthma, the inflammation is progressively increased and leads to bronchial muscle constriction, increased vascular permeability, increased airway secretions, mucosal oedema, mucus hypersecretion, reduced lung function and further limitair flow.[13]

Thus the ancient *Siddhars* have dealt with all the signs and symptoms of Childhood asthma from mild, moderate to severe form as mentioned in *Suzhi kanam* . They have skilfully compared the attitude, walk, voice and posture of a child, type of breathing in *Suzhi kanam* with that of the bird Stroke, which is the specific characteristic of this type of *Kanam*.The etiopathogenesis of *Suzhi kanam*, its correlation with *mantham* is

comparable with the modern research explorations of allergic reactions due maternal nutrition in lactating mothers and the concept of "*karpachoodu*" in Siddha with that of Genetic basis of Atopic diseases.

Conclusion

Parallell analysis of Siddha literatures with that of modern scientific medical terms prove tothe world that the ancient system of Siddha medicine withholds in it the essentials of past, present and the future for the profession of medicine. Thus correlating the symptoms of *Suzhi kanam* with Childhood asthma prompts an immense interest to explore more about the hidden wisdom of spiritual saints called *Siddhars* who lived thousands of years behind the present scientific world whose enormous knowledge in the field of pediatric medicine (*Kuzhanthai maruthuvam*) is currently recognized and appreciated.

References:

1. Ghai, O.P. 2005. Essential Pediatrics. 6 th Edition. New Delhi: CBS Publishers & Distributors, p.768.
2. National Family Health Survey (NFHS-3) 2005–06. India: Volume Mumbai: IIPS International Institute for Population sciences (IIPS) and macro International, 2007.
3. Kalyanasundaram, T.K. 2011. Siddha Maruthuvam Vol. 7: Kuzhandai Maruthuvam. 1 st Edition. Chennai, Tamil Valarchi Kazhakam, p.400
4. Gurusironmani Pon. 1992. Balavagadam. 2 nd Edition. Chennai, Department of Indian Medicine and Homoeopathy, p.721.
5. Sears MR, Burrows B, Flannery EM, Herb ison GP, Hewitt CJ, Holdaway MDRelatio n between airway responsiveness and serum IgE in children with asthma and in apparently normal children. *N Engl J Med*325199110671071
6. William O.C. Cookson, Miriam F. Moffatt, Genetics of asthma and allergic disease, *Human Molecular Genetics*, Volume 9, Issue 16, 1 October 2000, Pages 2359–2364.
7. Burrows B, Martinez FD, Halonen M, Bar bee RA, Cline MGAssociation of asthma with serum IgE levels and skin-test reactivity to allergens. *N Engl J Med*3201989271277
8. Kattan JD, Cocco RR, Järvinen KM. Milk and soy allergy. *Pediatr Clin North Am*. 2011;58(2):407-x. doi:10.1016/j.pcl.2011.02.005.
9. Pali-Schöll, Isabella et al. "Update on allergies in pregnancy, lactation, and early childhood." *The Journal of allergy and clinical immunology* vol. 123,5 (2009): 1012-21. doi:10.1016/j.jaci.2009.01.045.
10. M. Cecilia Berin, in Encyclopedia of Gastroenterology, 2004 .
11. Kliegman, Robert., et al., Text book of Pediatrics Vol-2 (Edition 21.). Philadelphia, PA: Elsevier.
12. Stuebe AM, Grewen K, Meltzer-Brody S. Association between maternal mood and oxytocin response to breastfeeding. *J Womens Health (Larchmt)*. 2013;22(4):352-361. doi:10.1089/jwh.2012.3768.
13. Oren E, Rothers J, Stern DA, Morgan WJ, Halonen M, Wright AL. Cough during infancy and subsequent childhood asthma. *Clin Exp Allergy*. 2015;45(9):1439-1446. doi:10.1111/cea.12573.
14. Karin C. Lødrup Carlsen, Mariëlle W. Pijnenburg, Monitoring asthma in childhood. European Respiratory Review Jun 2015, 24 (136) 178-186; DOI: 10.1183/16000617.00003714.
15. Steven W. Salyer, Chapter 15 - Pulmonary Emergencies, Editor(s): Steven W. Salyer, Essential Emergency Medicine, W.B. Saunders, 2007, Pages 844-913,ISBN 9781416029717.
16. Benard A, Desremaux PHuglo D, Hoorelb eke A,Tonnel AB,Wallaert B(1996) Increa sed intestinal permeability in bronchial asthma. J Allergy Clin Immunol **97**:1173–1178.
17. Caffarelli C, Deriu FM, Terzi V, *et al* Gastrointestinal symptoms in patients with asthma *Archives of Disease in Childhood* 2000;82:131-135.
18. Managing feeding difficulties and behaviours in food allergic childrenWritten by: Lisa Waddell | Published: 18 May 2018.
19. Cukic V, Lovre V, Dragisic D. Sleep disorders in patients with bronchial asthma. *Mater Sociomed*. 2011;23(4):235-237. doi:10.5455/msm.2011.23.235-237.
20. Lemanske RF Jr. Inflammatory events in asthma: an expanding equation. J Allergy Clin Immunol. 2000 Jun;105(6 Pt 2):S633-

6. doi: 10.1067/mai.2000.106155. PMID: 10856170.

21. Kumari MV, Devanarayana NM, Amarasiri L, Rajindrajith S. Association between functional abdominal pain disorders and asthma in adolescents: A cross-sectional study. *World J Clin Cases*. 2018;6(15):944-951. doi:10.12998/wjcc.v6.i15.944.
22. . Alexander, Jeffrey & Hunt, Loren & Patel, Ashok. (2000). Prevalence, Pathophysiology, and Treatment of Patients With Asthma and Gastroesophageal Reflux Disease. Mayo Clinic proceedings. Mayo Clinic. 75. 1055-63. 10.4065/75.10.1055.
23. Antonio Maria Ângela Reis de Góes Monteiro, Ribeiro José Dirceu, Toro Adyléia Aparecida Dalbo Contrera, Piedrabuena Aquiles Eugenico, Morcillo André Moreno. Linear growth in asthmatic children. J. Pneumologia [Internet]. 2003 [cited 2021 Feb 15] ; 29(1): 36-42.
24. Andrea J. Apter, Susan T. Reisine, Glenn Affleck, Erik Barrows, Richard L. ZuWallack, The influence of demographic and socioeconomic factors on health-related quality of life in asthma, Journal of Allergy and Clinical Immunology, Volume 103, Issue 1, 1999, Pages 72-78, ISSN 0091-6749.
25. Monica Kraft, The role of bacterial infections in Asthma, Clinics in Chest Medicine, Volume 21, Issue 2, 2000, Pages 301-313, ISSN 0272-5231.
26. Yeh SY, Schwartzstein R. Asthma: Pathophysiology and Diagnosis. Asthma, Health and Society. 2009 Jun 8:19–42. doi: 10.1007/978-0-387-78285-0_2. PMCID: PMC7176227.
27. Ortiz-Alvarez O, Mikrogianakis A; Canadian Paediatric Society, Acute Care Committee. Managing the paediatric patient with an acute asthma exacerbation. Paediatr Child Health. 2012 May;17(5):251-62. doi: 10.1093/pch/17.5.251. PMID: 23633900; PMCID: PMC3381918.
28. Gani, F., Caminati, M., Bellavia, F. *et al*. Oral health in asthmatic patients: a review. *Clin Mol Allergy* **18,** 22 (2020).
29. Eckert DJ, Catcheside PG, Smith JH, Frith PA, McEvoy RD. Hypoxia suppresses symptom perception in asthma. Am J Respir Crit Care Med. 2004 Jun 1;169(11):1224-30. doi: 10.1164/rccm.200305-630OC. Epub 2004 Mar 12. PMID: 15020291.