



CRITICAL APPRAISAL ETIOLOGICAL FACTORS OF TAMAKSHVASA

Dr. Trupti Gupta*¹, Dr. Arun Kumar Gupta² and Dr. Satej T. Banne³

¹MD (Agadtantra), Assistant Professor Dept. of Agadtantra, Rajeev Gandhi Ayurveda College & Hospital Bhopal.

²MD (Panchakarma), Assistant Professor Dept. of Panchakarma, L.N.Ayurveda College & Hospital Bhopal.

³Ph.D. Scholar, Assistant Professor, Department of Dravyaguna Vigyana, Parul Institute of Ayurved, Parul University, Limda, Vadodara, Gujarat, India.

Corresponding Author: Dr. Trupti Gupta

MD (Agadtantra), Assistant Professor Dept. of Agadtantra, Rajeev Gandhi Ayurveda College & Hospital Bhopal.

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ABSTRACT

TamakaShvasa is mentioned as one of the variety among five types of Shvasa. But out of these, KshudraShvasa present as symptom in most of the diseases & it does not require any medication whereas MahaShvasa, UrdhvaShvasa & ChinnaShvasa were present in the terminal stages of various diseases. TamakaShvasa is a 'Swantartra' Vyadhi & having its own etiology, pathology & Management. At present, asthma is reported in 1.2 – 6.3 % adults in most countries.^[1] About 300 million people worldwide suffering from asthma and the number has risen by around 50 % in the last decade.^[2] TamakaShwasa is kaphavatatmaka and pitta sthanasamudbhavavyadhi of pranavahasrotas. Though tridosha are intricate in this disease but mostly vata and kapha are involved. Vyanjakahetu show a main role in incentive of hidden dosha of the body. The review stated that nidana revealed in Ayurveda for TamakaShwasa are relevant to current era in the pathogenesis of disease. Hence nidanaparivarjana helps in conservation of health eminence of patients of TamakaShwasa. The patients were sternly advised to follow the restraints regarding food, food habits, and life style. To the magnitude possible, they were instructed to avoid the credible causative factors of the disease and roots of Agnimandya. Pathyasevana and Apathyavarjana have chief role in prevention and managing of Tamakashwasa.

KEYWORDS: Etiological factors, TamakShvasa.

1. INTRODUCTION

TamakaShvasa is mentioned as one of the variety among five types of Shvasa. But out of these, KshudraShvasa present as symptom in most of the diseases & it does not require any medication whereas MahaShvasa, UrdhvaShvasa & ChinnaShvasa were present in the terminal stages of various diseases. TamakaShvasa is a 'Swantartra' Vyadhi & having its own etiology, pathology & Management. At present, asthma is reported in 1.2 – 6.3 % adults in most countries.^[1] About 300 million people worldwide suffering from asthma and the number has risen by around 50 % in the last decade.^[2] Asthma is distinct as chronic inflammatory disease of airways that is categorized by amplified responsiveness of tracheobronchial tree to multiplicity of stimuli. It is manifested physiologically by widespread narrowing of air passages.^[3] According to WHO in India there are 15-20 million asthmatics are existing worldwide and death rate reached over 180,000 annually.^[4] ShwasVyadhi is disease of PranavahaStrotas. The disease in which PranVayu is focused in upward movements resulting in sound like Bhastrika is called as Shwas.^[5] The origin of PranavahaStrotas is Hrudaya as well as Mahastrotas.

thusPranVayu is accountable for breathing out and breathing in, which is significant for our living . In current era due to worrying modern living occurrences of Bronchial Asthma cases are increased. Smoking, Atmospheric Pollution, Occupational causes, Dietary factors these are etiological factors of Asthma.^[6] In Ayurveda Bronchial Asthma is named as ShwasVyadhi and according to its individualities types of ShwasVyadhi are defined MahaShwas, UrdhvaShwas, ChinnaShwas, KshudraShwas, TamakShwas are designated. Symptoms of this type of ShwasVyadhi can be correlated with Modern Science.

2. AIM AND OBJECTIVES

To Review Etiological factors in Samprapti of TamakShvasa.

3. Nidan (Etiological factor & Diagnosis)

The term Nidana relates both to the etiology as well as diagnosis of diseases. Etiology helps in ascertaining the causative factors of a disease where as diagnosis helps in determination of the nature of disease based on the causative factors, premonitory symptoms, actual signs,

exploratory therapy and pathogenesis. In the present context term Nidana refers to the causative factors (Hetu) of disease TamakaShvasa. A single etiological factor may produce a single disease or many factors together may produce a single disease and vice versa. Ch. Ni. 8/24. This occurs also in the case of Tamakashvasa. Tamakashvasa can be produced by one or more etiological factors. TamakaShvasa is mentioned as

Kashtasadya or Yaapya. Nidana has got much importance in such diseases which remain for longer period. Vyadhi goes on as long as patients get exposed to these Nidana. Hence their thorough knowledge is essential to avoid Nidana. In Ayurvedic texts, Nidana of Tamakashvasa as such are not mentioned separately but Nidana of ShvasaRoga in general are given.

Table 1: Summary of Nidana's mentioned by various Acharyas.

Etiological factors	Charaka	Sushruta and Madhava	AstangaHridaya	AstangSangraha
AAHAR (VATA PRAKOPAKA)				
Rukshanna	+	+	-	-
Vishamashana	+	+	-	-
Dvanadvatiyoga	+	-	-	-
Visha	+	+	-	-
Adhyashana	-	+	-	-
Anashana	-	+	-	-
Sheetasthana	-	+	-	-
Samashana	-	+	-	-
Sheetapana	-	+	-	-
VishtambhiAahara	+	+	-	-
PITTA PRAKOPAKA				
Tila Tail	+	-	-	-
Vidaahi	+	+	-	-
Katu	-	-	-	+
Ushna	-	-	-	+
Amla	-	-	+	+
Lavana	-	-	+	+
KAPHA PRAKOPAKA				
Nispaava	+	-	-	-
Maasha	+	-	-	-
Pistanna	+	-	-	-
Saluka	+	-	-	-
Gurudravya	+	+	-	-
JalajaMamsa	+	-	-	-
AnupaMamsa	+	-	-	-
Dadhi	+	-	-	-
Aamakshira	+	-	-	-
Pinyaka	+	-	-	-
ShleshmalaDravya	+	-	-	-
Abhishyandidravya	+	+	-	-
Utkledi	-	-	-	+
VIHARA (VATA PRAKOPAKA)				
Rajas	+	+	+	+
Dhuma	+	+	+	+
PragVata	+	+	+	+
SheetaSthana	+	+	-	-
SheetaAmbu	+	+	+	+
Vyayama	+	+	-	-
Gramya Dharma	+	-	-	-
Atiapatrapana	+	-	-	-
ShuddhiAtiyoga	+	+	-	-
KanthaPratighaata	+	-	-	-
UrahPratighaata	+	-	-	-
Karmahata	+	+	-	-
Adhvahata	+	+	-	-
Strisevana	-	+	-	-

BharaKarshita	-	+	-	-
Veganirodha	-	-	-	+
Vegaghata	-	+	-	-
Abhighata	-	+	+	+
Marmabhighata	+	-	-	-
Aayasa	-	-	-	+
Jagarana	-	-	-	+
Vega Udirana	-	-	-	+
PITTAPRAKOPAKA				
Ushma	-	-	-	+
KAPHA PRAKOPAKA				
AbhishyandiUpachara	+	-	-	-
Divasvapna	-	-	-	+
NIDANARTHAKARAROGA				
VATA PRAKOPAKA				
Aanaha	+	-	-	-
Atisara	+	-	-	-
Aamapradoshaja	+	+	-	-
Daurbalya	+	-	-	-
Kshatkshaya	+	-	-	-
Udavarta	+	-	-	-
Visuchika	+	-	-	-
Alasaka	+	-	-	-
Panduroga	+	-	+	+
VishaSevana	+	-	+	+
Vibandha	+	-	-	-
DhatuKshaya	-	-	-	+
Kshaya	-	+	-	-
Aavarana	-	-	-	+
DoshaPidana	-	+	+	+
PITTA PRAKOPAKA				
Rakta Pitta	+	-	-	-
Jvara	+	-	-	-
KAPHAPRAKOPAKA				
Kaasa	-	-	+	+
AamaPradoshaja	-	+	-	-
Aamatisara	-	-	+	+
Chardi	+	-	+	+
Pratishyaya	+	-	-	-

Various Nidana have been mentioned by Acharyas in classics as listed above. But all these are distant causes of disease i.e. factors which initiate the process of mobilization are further broadly classified as -

3.1 Asaatmendriyarthasamyoga i.e. unwholesome contact with objects of senses.

3.2 Prajnyaparadha (Intellectualblasphemy)

3.3 Parinama (seasonal vagaries) (Cha. Su.11/43).

3.1 Asaatmendriyarthasamyoga

Asaatmendriyarthasamyoga i.e. unwholesome conjunction of the sense organs with their objects can be of three types, it can be either excessive utilization, non utilization or wrong utilization. If these Indriyas are in proper correlation with sense objects (Samyaka Yoga) then there will be no difficulty and health is preserved. On the contrary these abnormal association or contact might happen either accidentally, inevitably or intentionally. Such improper contact bestows bad effects not only in the concerned sense organ but also on mind and body results into disease state. Manifestation of

disease depends on Hetu of Bala. The Loka and Purusha interact through the dynamic medium of three fundamental factors viz. Kala (Rhythm of time) Buddhi (intellect) and Indriyarth (object of Senses). Samyoga (balanced exposure) of Kala, Buddhi and Indriyarth are necessary for the existence of an individual but Ayoga, Atiyoga and Mithiyayoga of the same factors i.e. Kala, Buddhi and Indriyarth plays pathogenic role and precipitate morbidities of different kinds. Thus these three are classically considered in Ayurveda as fundamental causes of disease. Srotrendriya (ear) - object Shabda (sound)

MithyashabdaSamyoga

Hearing of BhishanaDhvani (terrifying words), Upaghata (news of accidents, murder, theft etc) IstavinashaShabda

(hearing words conveying loss of relatives, friends, money etc.) ParushaVachana (abuse, rough or harsh words) may create fear in persons mind and especially those persons, who are having less Satvaguna, may suffer from dyspnoea/ Shvasakastata. Particularly in case of children, due to hearing of sudden large sound / abnormal sound, children may get disquiet, starts to cry. Due to weeping vitiation of UdanaVayu takes place. This vitiated Udana affects its Mulasthanas i.e. Phupphusa, resulting into narrowing of airways further leads to transient dyspnoea. Some time it may cause cyanosis of lips, nose and ear due to deficient oxygen. After relieving spasm patient will be normal.

As far as the disease TamakaShvasa is concerned, acute exacerbation of asthma may occur due to Mithya yoga of Shabda as discussed above.

This ShabdaMithya yoga may be considered as Triggers i.e. it can not cause asthma to develop initially but can exacerbate asthma once it is present. These triggers cause asthma exacerbation by acute bronchoconstriction.

Sparshanendriya (skin) object Sparsha (touch) Sparshamithya Yoga

All the objects, which are present in surrounding atmosphere, are in continuous contact with our skin knowingly or unknowingly. Due to this contact of poisonous and polluted air, poisonous objects, stormy weather, NiyamViruddhaSnanadi (improper manner of taking bath), contact with very cold substances & cold weather causes Mithya yoga of this Indriya. Now a days increased air pollution leads to greater incidence of bronchial asthma i.e. TamakaShvasa. Exposure to dust, irritant gaseous, domestic mites, and allergens causes irritation to respiratory mucosa and results into reflux bronchoconstriction. Continuous exposure to allergens result into allergic reaction & produces chronic inflammation of respiratory membrane. Another type of Sparsha explained by AcharyaCharaka i.e. ManasaSparsha. ManasaSparsha may be accepted as ManasaPratyaksha. Any disturbance in ManasaSparsha leads to Shvasa. According to modern opinion emotional imbalance leads to acute exacerbation of asthma. When person is angry, respiration rate increases. Sexual act also some times results into exacerbation of asthmatic attacks. Now a days number of cosmetic products are available e.g. body spray, lotion, creams etc. which are Asaatmya to some person leading to asthma development. Thus, continuous exposure to dust, domestic mites, animal allergen, air pollutants through Sparshana acts as Nidana due to Mithyayoga of Sparshanendriya (respiratory mucosa)

Ghranendriyaatiyoga

Smell of substances which are AtiTikshna, Atiugra very strong smells such as musk, drugs, chemicals, irritant gases causes Atiyoga of Ghranendriya. In some persons it acts as a trigger for allergic reaction.

Mithyayoga

Smell of substances which are Puti, Dwista, unpleasant, klinna, VishaAnila (poisonous gases), kunapa (cadaveric) and such others acts as aggravating factor. Bronchial asthma is chronic airway disease & these airways are in direct contact with nose. Irritants such as wood smoke, household sprays, volatile organic compounds (e.g. polishes and cooking oils) and air pollutants may also exacerbate asthma. SO₂ is an irritant gas which can trigger dose dependant airflow limitation in patients with asthma. Airflow limitation may be incited by SO₂ at concentration as low as 1 ppm, a level easily encountered in the workplace or elsewhere in the environment. In many countries levels of NO have gone up over past 10 years. These substances are known to damage respiratory epithelium, although it is unlikely that nitrogen oxides directly increases the prevalence of asthma, damage that they cause may have permitted other antigens easier entry into lungs. Active and passive smoking also increases incidence of asthma in society. These are associated with presence of higher IgE levels.

Rasanendriya (tongue) object - Rasa (taste)

Excessive indulgence of only one Rasa especially Madhura Rasa may lead to Shvasa. Vagbhata has mentioned Shvasa as a result of Madhura Rasa Atisevana. TamakaShvasa gets aggravated due to excessive use of SheshmalDraya i.e. Madhura, Amla and Lavana Rasa. All these Rasa produces vitiation of Kapha in body and KaphaVridhhi results into Shvasa.

Chakshurendriya (eye) Object - Rupa

Mithyayoga - Seeing objects for a long time which are very near / very far. Sights which are Roudra (terrifying), Bhairava (fearful), Abdhuta (unusual, unprecedented), Dwista (annoying), Bibhastha (emotional), Vikrita (unnatural, abnormal) due to these MithyayogaAlpasatva persons suffers from KshudraShvasa i.e. temporarily breathlessness. In asthmatic persons it may aggravates preexisting condition.

3.2 Prajnaparadha

It is the second group of factors causing for diseases. Prajna means correct knowledge and Aparadha is offence, transgression, violation or abuse. Prajnaparadha is thus defined as improper behavior due to incorrect knowledge. This in turn is due to loss of Dhi, Dhriti and Smriti. All these three together, constitute the functions of mind and when these are normal mind is also said to be normal. Nidana such as Vegavarodha, excessive exercise and sexual act, ShuddhiAtiyoga, Atiapatrapana, Sahasaja karma are from this group & may leads to Shvasa.

ALLERGIES AND PRAJNYAPARADHA

Allergy

Allergy has been defined as "a foolishness of the body tissues". Body tissues fail to recognize and accept common substances as wholesome. We all are endowed with power to make out the difference between harmful

and safe substances of our daily use diet articles, clothing, perfumes, flower, books and papers, mattresses, pillow, bed sheets, things of personal use along with pets and their fur, hair, air, dust, smoke etc. We are freely using these and living almost them without any discomfort. Our body tissues, nose, skin, lungs and G.I. Tract are receptive to all these without any problem. Our surrounding atmosphere is also full of allergens such as domestic mite, animal allergens, pollens, irritant gases. All the persons are not having discomfort or allergy with these but some of them suffer from allergic reaction. Nasal mucosa identified this asharm ful subject's allergies and an allergic reaction in the form of a powerful strong rejection which includes Sneezing and profuse watering of nose. The reaction is sudden and powerful. Allergic reactions in the lungs, nose, skin and G.I.T tract are usually sudden, strong alarming and dramatically resolved if the cause is detected and removed. This has been beautifully described by the texts in the following words,

"Bhutva-BhutvaPratishyayoYoAkasmatNivartate, SannipatikPratishyaya".

(S.U. 29/10)

KshanikUtpadaVinasha Cha. (Ma.Ni. MadukoshKoth definition)

But this may not happen in every case. Onset in an allergic manifestation can go for a long spell of time, which happens in asthma. Thus immune system of body, which is meant for performing protection against allergies, but an important undesirable side effect of immunity, is the development under some conditions, of

4. PATHOLOGICAL NATURE OF HETU

Table 2: Pathological nature of Hetu.

AaharaHetu	Dosha	Guna	Dushya/Srotasa	Samprapti
Cold water, Excessive cold Drinks	Vata, Kapha	Sheeta	Rasa	SankochaPradhana
Rukshanna	Vata	Ruksha	Rasa	Dhatukshayajanya
Vishamahara	Kapha	Abhishyandi	Rasa	Kaphapradhana
Heavy diet like Masha	Kapha	Guru	Rasa, Rakta	Kaphapradhana
Vidahi diet	Pitta	Vidahi	Rasa, Rakta	Pittapradhana
Abhishyand diet like Dadhi	Kapha	Guru	Rakta, Mamsa	Aamajanya
Jalaj, Anup Mamsa	Kapha	Guru	Rakta, Mamsa	Aamajanya
Til Tail				
VishaSevana	Tridosha	Vyavayi	Rakta, Oja	Immediate and Asaatmyatye
Excess use of Dadhi, Milk	Kapha	Guru, Abhishyandi	Rasa	Kapha, Aampradhana
Dust, fumes, pollen contact	Vata, Kapha	RukshaLaghu	Pranavaha	Srotovaigunya
SheetaVihara	Vata, Kapha	Sheeta	Rasa, Pranavaha	SankochaPradhana
SheetaJalaSnana	Vata, Kapha	Sheeta	Prana, Rasavaha	Sankocha
Excessive Vyayam	Vata	Ruksha	Deficient Dhatusneha	DhatukshayaJanya, Sankoch
Excessive VyavayaAdhva	Vata	Ruksha	Deficient Dhatusneha	PratilomaDhatukshaya
Vegavarodha	Vata	-	Pranavaha	Vatapradhana
Excessive Shodhana	Vata	Ruksha	Rasa	Vatapradhana

To explain role of Nidana in pathogenesis of disease these Nidana mentioned in Samhita can be classified as -

allergy or other types of hypersensitivity. Prajnya we normally talk about is one of a gross nature, pertaining to intellect, self control, memory of a person or an individual. In case of every cell it is having own Prajnya. This prajna decides whole some and unwholesome things for every particular cell. Those persons in which allergic reaction takes place this process gets disturbed and cell reacts as an allergic body to dust, mites etc and it shows powerful reaction in the form of powerful sneezing or acute exacerbation of asthma. Genes located in the nuclei of all cells of the body control heredity as well as they control day-to-day function of all body cells. The genes control cell function by determining which substances is synthesized within cell i.e. structure, enzymes, and chemicals. Ultimately that particular gene which gets disturbed and reacts to normal antigen like dust, mites etc, decides production of antibody and other chemicals. This may be considered as Prajnaparadha of that particular cell.

3.3 Parinama (kala)

It is enumerated as the third cause of diseases. Parinama literally means "change or transformation" from an earlier state to the present and from the present to the future such a transformation is known as kala (time). In Tamakashvasa Kala plays an important role. Aggravation of symptoms takes place in early morning hours, Meghambu (Cloudy atmosphere) and Sheetakala. In case of PratamakaShvasa symptoms are aggravated in Ushna Kala i.e. Grishmaritu, where as during Ushna Kala symptom gets subsided in case of TamakaShvasa.

Bahya (Agantu) Hetu

Raja, Dhuma, Prag-vata sevana, Marmaghata, Kantha, Urasah, Pratighata.

ABHYANTARA (NIJA) HETU

Vataprakopaka like sheetasthana, Sheetambusevana etc. Kaphaprakopaka like Maasha, Pinyaka, Pistannasevana etc. Amapradoshaja like Abhishyadi, Ksheera, Dadhisevana etc.

1. Dosha Prakopaka Hetu**i) Vataprakopaka**

Rukshanna, Sheetasthana, Sheetambu, Vyayama, Adhvasevana

ii) Kaphaprakopaka

Jalaj, AnupaMamsa, Dadhi, Nispava, Mash, Pinyaka, Guru, Bhojana, Ksheera

2. Amapradoshaja

Vishamashana, Dadhi, Abhishyandi, Amaksheera, Guru bhojana

3. Khavaigunyakaraka

Raja, Dhuma, Adhvasevana, Dwandva, Kshatakshaya, Marmaghataet

4. Nidanarthakararoga

Pratishyaya, Kasa, Udavarta

5. Mulasthanadustikaravyadhi

Atisara, Jwara, Chardi, Visuchika, AtisaraAlasaka

6. Iatrogenic: Shudhiatiyoga, Atiapatrapana**7. PrerakaHetu**

Meghambu, Sheeta, Pragvata, Durdine, Raja, Dhuma, Vyayama These Nidana produces pathological changes in body.

Raja and dhumasevana

When these particles are inhaled with air & comes in contact with Sleshmadhara Kala it causes local irritation in the Srotasa. Body tries to expel these foreign particles. But due to the preexisting Srotodushti it can not be expelled naturally and acts as an aggravating factor for Shvasa. Here reflexes that originate in lungs leading to bronchoconstriction activate parasympathetic nerves. Most of these begin with irritation of epithelial membrane of the respiratory passageways themselves initiated by dust, smoke etc. (Text book of phys, by Guyton Page 441). Various risk factors like smoking, indoor pollutants, outdoor pollutatants comes under this Nidana

Tobacco smoke

Tobacco burning, which is a ubiquitous source of indoor irritants, produces a large and complex mixture of gases, vapors, and particulate matter. More than 4,500 compounds and contaminants have been identified in tobacco smoke, among them respirable particles, polycyclic hydrocarbons, carbon monoxide, carbon dioxide, nitric oxide, nitrogen oxides, nicotine, and acrolein.

Passive smoking

There is evidence that exposure to environmental tobacco smoke (i.e., passive smoking) increases the risk of lower respiratory tract illnesses in utero, in infancy, and in childhood. Sidestream smoke, which burns hotter and is more toxic than the smoke inhaled by the tobacco user, is particularly irritating to the respiratory mucosa. Smoking by a child's mother during pregnancy plus smoking by any member of the household after the child is born increases the child's risk of developing asthma and wheeze. The effects of environmental tobacco smoke exposure on adult asthma have not yet been investigated extensively and the available data are limited.

Active smoking

While active smoking may increase the risk of developing occupational asthma in workers exposed to some occupational sensitizers (e.g., acid anhydrides), there is still limited evidence that active smoking is a risk factor for the development of asthma. However, active smoking is associated with accelerated decline of lung function in people with asthma, greater asthma severity, and poor response to asthma treatment, supporting the concept that active smoking may contribute to asthma severity even without contributing to the development of asthma.

Air Pollution

Air pollution is defined as the atmospheric accumulation of irritants to a degree that becomes injurious to humans, animals, or plants. Both outdoor and indoor irritants contribute to air pollution.

Outdoor pollutants

There are two main types of outdoor pollution: industrial smog (sulfur dioxide particulate complex) and photochemical smog (ozone and nitrogen oxides), and they can coexist in a given area. Levels of air pollutants are affected by weather conditions and local geographic features. Several studies have implicated various pollutants as aggravating asthma, mainly in experiments with controlled chamber exposure. However, because of the great number of variables, epidemiological studies trying to link the rising trend of asthma with ambient pollution have been inconclusive. Some studies have shown a significant association of air pollutants such as ozone, nitrogen oxides, acidic aerosols, and particulate matter with symptoms and exacerbations of asthma. It is possible that chronic exposure to pollution may predispose to respiratory disease in a more subtle and complicated manner. Environmental pollutants such as sulfur dioxide, ozone, and nitrogen oxides can, at concentrations found in heavily polluted cities, trigger bronchoconstriction, transiently increase airway responsiveness, and enhance allergic responses. Thus, in theory, pollution might indeed contribute to the development of asthma. However, although asthma seems to be more frequent in industrialized countries, there is little, if any, evidence that air pollution is directly responsible for the increased prevalence of asthma in

these countries.

Exposure to traffic, particularly to diesel exhaust, may exacerbate preexisting allergic conditions but does not necessarily induce the development of new cases of asthma and atopy. Diesel particles have also been shown to absorb allergens from grass pollen onto their surface and may therefore act as potential carriers to increase deposition of pollen allergens in the lung. In this way, both the allergen dose and the antigenicity of the pollen allergen may be enhanced by automobile-related pollution.

Indoor pollutants

The contaminants and atmospheric dynamics of indoor air pollution are different from those of outdoor air pollution. Modern construction techniques possibly contribute to greater indoor pollution by lowering the turnover of indoor air. An increased indoor pollutant load may be in addition to the increased antigen load (in particular, from the feces of domestic mites) produced by changes in house design and forms of heating and furnishing (especially the use of carpets and upholstered furniture). Because very young children spend most of their time indoors, and because residents of developed countries also spend 90 to 95 percent of their time indoors, indoor pollutants are important to consider. However, each home indoor environment is unique, and air quality may vary from house to house and even from room to room. Major indoor pollutants are nitric oxide, nitrogen oxides, carbon monoxide, carbon dioxide, sulfur dioxide, formaldehyde, and biologicals such as endotoxin.

Sources of these indoor pollutants include the following

- Cooking with natural gas or liquid propane, which produces carbon monoxide, carbon dioxide, sulfur dioxide, nitric oxide, and nitrogen oxides
- Cooking on wood, kerosene, or coal-burning stoves, which produces carbon monoxide nitrogen oxides, and sulfur dioxide as well as respirable particles.
- Heating with gas, wood, coal, and kerosene units and fireplaces, which produces carbon monoxide, carbon dioxide, nitric oxide, nitrogen oxides, respirable particles, and particulates soot Building and furnishing with foam installations, glues, fireboard, pressed board, plywood, particle board, carpet backing, and fabrics that contain the volatile organic compound formaldehyde, and using paints or other materials that release isocyanates. Some data suggest that indoor pollutants may contribute to the development of asthma. Among the problems related to indoor pollution are nose irritation, respiratory infections and bronchitis, and lung cancer as a result of respirable particles; nose irritation, impaired lung function, and increased infections in children as a result of nitrogen oxides; and difficulty in breathing and asthma symptoms as a result of formaldehyde.

5. KANTHURASAHPRATIGHATA AND MARMAGHATA

These are Agantu Hetus which results into Maha, Chhinna & Urdhva Shvasa or it may produce Khavaigunya in Urahsthana.

6. RISK FACTORS

Asthma is a chronic inflammatory disorder of the airways. This chronic inflammation is responsible for increased airway hyperresponsiveness to a variety of stimuli and for the recurrent symptoms and airflow limitation characteristic of asthma. The risk factors are of two types i.e. involved in the development or onset of asthma and the risk factors (triggers) involved in the development of exacerbations.

- Predisposing factors that give an individual a susceptibility to the disease. These include atopy the propensity to produce abnormal amounts of IgE in response to environmental allergens.
- Causal factors that sensitize the airways and cause the onset of the asthma. These include inhaled allergens present indoors and outdoors (such as domestic mites, pollens, furred animals, and fungi) as well as inhaled allergens and chemical sensitizers in the workplace.
- Contributing factors that either augment the likelihood of asthma developing upon exposure to a causal factor or may even increase susceptibility to asthma. These include tobacco smoking, air pollution, viral respiratory infections, small size at birth, diet, and parasitic infections.

7. RISK FACTORS INVOLVED IN THE DEVELOPMENT OF ASTHMA

- Asthma is a chronic inflammatory disorder of the airways. This chronic inflammation is responsible for increased airway hyperresponsiveness to a variety of stimuli, for the recurrent symptoms and airflow limitation characteristic of asthma.

8. POTENTIAL RISK FACTORS FOR ASTHMA HOST FACTORS (Predisposing Factors)

- Genetic predisposition
- Atopy
- Airway hyperresponsiveness
- Gender
- Race/ethnicity

ENVIRONMENTAL FACTORS

Factors that influence the susceptibility to the development of Asthma in predisposed individuals

Indoor allergens

Domestic mites
Animal allergens
Cockroach allergen
Fungi, molds, yeasts

Outdoor allergens

Pollens
Fungi, molds, yeasts
Air pollution
Outdoor pollutants
Occupational sensitizers

Tobacco smoke	Indoor pollutants
Passive smoking	Respiratory infections
Active smoking	Hygiene hypothesis
Family size	Parasitic infections
Diet and drugs	Socioeconomic status
	Obesity

Factors that precipitate asthma exacerbations and/or cause symptoms to persist

Indoor and outdoor allergens (see above)	Respiratory infections
Indoor and outdoor air pollutants	Exercise and hyperventilation Weather changes Sulfur dioxide
Foods, additives, drugs	Extreme emotional expression Tobacco smoke (active and passive)

9. PREDISPOSING FACTORS

Atopy: The propensity to produce abnormal amounts of IgE in response to exposure to environmental allergens appears to be strongest identifiable predisposing factor for asthma. Population studies also shown that majority of children & adults having early onset of asthma are atopic. Prevalence of asthma increases with increasing levels of IgE; those with low serum IgE have low prevalence of asthma. Prevalence of atopy in random population ranges from 30 to 50% but overall prevalence of asthma in general population is much lower which suggest that asthma is associated with atopy only in a proportion of atopic subjects.

Atopy & Inheritance of Asthma: Atopic disease occurs in families. Asthma & airway hyper responsiveness have been reported to occur in families.

Genetic Control IgE: High serum IgE seems to be inherited as an autosomal genetic recessive trait with an additional polygenic component where as different factors seen to govern specific IgE response. Distribution of atopic subjects is consistent with an autosomal dominant inheritance with a gene located on Chromosome II.

Genetic Control & Immune Response

Additional genes determining the specificity of the immune response located in the human leukocyte antigen complex (HLA) may govern the specificity of immune response to common aeroallergen in some individuals. Also mutations of the cytokines gene cluster present on chromosome 5 have been hypothesized to predispose subjects to asthma by up regulating the inflammatory responses.

Atopy & Asthma Inheritance: Presence of atopy in subjects with asthma further enhance the likelihood of developing asthma & those subjects without asthma does not influence the risk of asthma in their relative. Although asthma & atopy may inherit independently, coincidence of asthma & atopy or atopic manifestation

such as eczema in one individual greatly increases risk of asthma in her or his relatives. Thus the risk of atopic parents with asthma having a child with asthma is two fold to threefold higher when a family asthma is two fold to threefold higher when a family history of asthma is accompanied by one of atopy. Similarly when airway hyper responsiveness & atopy are present in parents, prevalence of asthma increases in offspring.

Gender & Asthma: Childhood asthma is more prevalent in boys than girls. However, the increased risk for males in childhood seems not to be related to gender but to the narrower airways. Increased airway tone in boys predisposes them to enhanced airflow limitation. This difference disappears after age 10 when airway diameter / length ratio is the same in both sexes probably because of changes in thoracic size that occurs with puberty in male but not in females.

Race & Asthma: The increase of asthma prevalence in developing countries in different parts of world suggests that environmental factors may be more important than genetic & racial factors for the development of asthma. Even though there is slight difference in asthma prevalence between different races. This difference may be attributable to socio-economic conditions, allergen exposure dietary factors than to racial predisposition.

10. CAUSAL FACTORS

Causal risk factors sensitize the airways and cause the onset of asthma. The most important causal factors of asthma in terms of number of people exposed are probably inhaled allergens. These allergens sensitize atopic subjects by stimulating the development of specific T-lymphocyte clones & production of specific IgE onset of asthma by continuously stimulating chronic allergic inflammation of the airways as improvement of asthma occurs after Cessation of exposure. The risk of sensitization to allergens seems to peak in the first year of life when exposure occurs in conjunction with the ongoing development of mucosal immune system.

Indoor Allergens: Indoor allergens include domestic mites, animal allergens, cockroach allergen & fungi. Indoor allergens have increased in developed countries where homes have been carpeted, heated, cooled & humidified to make them energy efficient and have become an ideal habitat not only for domestic mites, cockroaches & other insects but also moulds & bacteria.

Domestic mites: Domestic mites are the most common potential indoor allergen and a major cause of asthma worldwide & WHO has recognized domestic mite allergy as a universal health problem.

House dust is composed of several organic & inorganic compounds, including fibers, mould spores, pollen grains, insects, insect feces, mammalian dander's, mites & mite feces. Domestic mite allergens are present in mite body's secreta, excreta & constitute the main

source of dust derived allergens. The most important mite allergens have proteolytic activity & thus they might have an easier access to the immuno competent cells. A concentration of mite allergen above 2 mg Per I/g of dust group I mite allergen seems to represent a significant risk factor for mite allergy.

Animal Allergens: Household warm-blooded animals release allergens in secretions, excretions & dander's.

Cats: Cats are potent sensitizers. The principle allergen, Fe Id, is found in cat pelt. The sebaceous secretions are probably the most important source. The allergen which is carried in small respirable particles is also a major risk for asthma exacerbations e.g. 30 out of 188 asthma patient admitted to emergency dept were allergic to cats compared 1 out of 2 control. Cat saliva is another source for cat allergen. Allergen has also be identified in voided urine from male cats dust from house with cat contains - 10 - 1500 m /g of (at allergen Fe/dI)

Dogs: Up to 30% of allergic individuals have positive skin tests to dog extras. A dog allergen has been purified from dog hair & dander. This antigen CadI is present in large concentrations in saliva & can be measured in house dust.

Rodents: Many children keep rodent in their bedrooms & there are inner city areas where wild mice/rats are present. The allergen city of rodent antigens is well known is animal handlers, who became sensitized to urinary protein.

Cockroach Allergens: In some locations among some ethnic groups sensitization to cockroach allergen may even be more common than to domestic mite allergen from German, America, & Asia than to domestic mite. Allergen from German, American & Asia cockroach i.e. BlagI, BlagII, Peral have been isolated.

Fungi: Molds yeasts can act as indoor air borne allergens. House humidifier provides a special risk for indoor fungal growth & air contamination. The most common indoor fungi are penicillium Aspergillus, Alternaria, candid, Claclosporium.

Outdoor Allergens: The most common outdoor allergen that causes asthma is susceptible people are pollen & fungi.

Pollens: Pollen allergens associated with development of asthma come mainly from trees, grasses & weeds. Micronic particles of starch granules are released from pollens particularly after rainfall seem to be responsible for pollen induced asthma exacerbation.

Fungi: Molds & yeasts are also outdoor airborne allergens.

Occupational Sensitizers: These are probably the only

firmly documented cause of asthma in adults. Subjects develop asthma only after exposure. Occupational sensitizers are usually classified by high / low molecular weight. High molecular weight sensitizers probably sensitize subjects and causes asthma exacerbations by the same mechanisms as allergens, but the mechanism of action of low molecular weight sensitizer remains largely unknown.

Drugs & Food Additives: Some food & other ingested substances such as salicylates, food preservatives, monosodium glutamate, & some food coloring agents have a recognized effect of causing asthma exacerbations. Some drugs such NSAID's are causal risk factors for asthma.

11. Contributing factors

Contributing factors ailment the likelihood of asthma developing upon exposure to a causal factor, they may even increase susceptibility of asthma.

Smoking

As discussed under Raja & Dhumasevana.

Outdoor Pollution: There are two main outdoor types of pollution industrial smog & photochemical smog. Environmental pollution such as So₂, Ozone, nitrogen oxide concentrations found in heavily polluted cities, trigger bronchoconstriction transiently increase airway responsiveness & enhance allergic response. In the last 10 years the levels of nitrogen oxide have gone up. These pollutants are known to damage respiratory epithelium damage that they cause may permit other antigens easier entry into lungs.

Indoor Pollutions: With modern construction techniques, possibly contributes to a greater indoor pollution e.g. an insulated energy efficient building homes. Because very young children spend most time with their mother indoors indoor pollution are important to consider. Working with natural gas/liq propane, produces Co, Co₂, So₂, NO, NO₂ and respirable particles. Building & furnishing with from installations, glases fireboard pressed board plywood & fabrics that contain the volatile organic compound formaldehyde using paints or other materials that release isocyanides.

Viral Respiratory Infections: There is no evidence that viral respiratory infections directly cause the development of asthma although it is well established that viral respiratory infection can exacerbate asthma - that is act as triggers.

Small size at birth: Disproportionate fetal growth which is often associated with a birth weight of less than 2500 gram, may carries increased risk of developing asthma during childhood / Adolescence. The mechanisms is unclear but it may involve reduced airway size caliber, increased susceptibility to allergen sensitization, increased susceptibility to viral infections & consequent

enhanced airway hyperresponsiveness.

Diet: Role of Breast feeding as a protective major for the development of asthma has been reported. In diet egg elimination by the mother during pregnancy & egg elimination in mother & child in 1st year of life, appeared to reduce incident of atopic disease. Children with food sensitive enteropathies & colitis have a higher subsequent prevalence of asthma.

12. Factor causing exacerbations: trigger

Triggers are risk factors that cause asthma exacerbation by inducing inflammation or provoking acute bronchoconstriction both. Triggers vary from person to person and from time to time. They include further exposures to causal factors that have already sensitized the airways of person with asthma.

Exercise & Hyperventilation

Exercise is probably the most common trigger of brief episodes of symptoms. Exercise incites airflow limitation in most children & young adults who have asthma. The mechanism of exercise induced air flow limitations are mainly related to changes of the airway mucosa induced by associated hyperventilation either cooling or rewarming or to changes of osmolarity of fluid lining the airway mucosa. Exercise appears to be a specific stimulus for people with asthma because it seldom leads to airflow limitation in people without asthma even those with other airway disease. Hyperventilation with cold dry or even hot air can cause asthma exacerbations. Through unknown mechanisms like exercise, hyperventilation seems to be a specific trigger for asthma.

Weather changes : Adverse weather conditions such as freezing temp, high humidity, thunderstorm episodes of acute pollution brought on by weather conditions have been associated with asthma exacerbation.

Extreme emotional expression: Emotional stress may be a trigger for asthma exacerbations primarily because extreme expressions of laughing, crying, anger or fear can lead to hyperventilation & hypocapnia that can cause airway narrowing. Panic attacks that are rare but not exceptional in some patients with asthma have similar effects.

Other factors that may exacerbate asthma: Rhinitis, sinusitis, polypus are some times associated with asthma. Gastro esophageal reflux can exacerbate asthma especially in children during menstruation or premenstrual exacerbations have been documented.

13. CONCLUSION

TamakaShwasa is kaphavatamaka and pitta sthanasamudbhavavyadhi of pranavahasrotas. Though tridosha are intricate in this disease but mostly vata and kapha are involved. Vyanjakahetu show a main role in incentive of hidden dosha of the body. The review stated

that nidana revealed in Ayurveda for TamakaShwasa are relevant to current era in the pathogenesis of disease. Hence nidana parivarjana helps in conservation of health eminence of patients of TamakaShwasa. The patients were sternly advised to follow the restraints regarding food, food habits, and life style. To the magnitude possible, they were instructed to avoid the credible causative factors of the disease and roots of Agnimandya. Pathyasevana and Apathyavarjana have chief role in prevention and managing of Tamakashwasa.

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