A SYSTEMATIC APPROACH TO ANALYZE STHIVANA LAKSHANAS IN DIFFERENT VYADHIS.

Dr. Bhavika Chaudhari¹, Dr. Sachin Deva²

¹ Final Year P.G. Scholar, Post Graduate Dept. of Roga Nidana Evum Vikriti Vigyana, Parul Institute of Ayurveda, Parul University, Limda, Waghadia, Vadodara, Gujarat, India.

² Associate Professor, Post Graduate Dept. of Roga Nidana Evum Vikriti Vigyana, Parul Institute of Ayurveda, Parul University, Limda, Waghadia, Vadodara, Gujarat, India.

Corresponding Author: Dr. Bhavika Chaudhari, Final Year P.G. Scholar, Post Graduate Dept. of Roga Nidana Evum Vikriti Vigyana, Parul Institute of Ayurveda, Parul University, Limda, Waghadia, Vadodara, Gujarat, India.

ABSTRACT:

‘Sthivana’ (expectoration) is the product that comes out after cough. It is also called as ‘Nishthivana’ (sputum). It is the secretion of lungs that is mala roopi kapha¹ which may contain some amount of Shonit (blood), Pitta (bile), or Puya (pus).² Sthivana comes out after Kasa (cough) which gives a hint regarding vikriti of Udan Vayu in Kantha pradesha producing ‘khass’ sound or shabda³. Kasa is one of the most common Pranavaha strotodushti vikara (disorder of Respiratory System) observed clinically and nishthivana can be seen as a prominent feature. As Pranavaha strotodushti (hampered Respiratory System function) conveys diseases affecting the Prana (life), this has to be considered as vyadhi of prime importance.

In Ayurveda classics we find very few references regarding Sthivana pareeksha (sputum examination) with special reference to sputum. So here an attempt is made to compile different characters of sthivana (expectoration) mentioned haphazardly in different diseases mentioned in our samhitas. Also an attempt is made to compare types of sthivana with characters of sputum mentioned in modern science so that early diagnosis of disease can be done and also treatment can be planned in a better way.

KEYWORDS: Nishthivana, Expectoration, Sputum.

INTRODUCTION:

In Ayurvedic texts Kasa is explained as an independent disease as well as it can be a vega, Lakshana (symptom) and updrava ⁴. When there is occurrence of an obstruction to the Vayu (vata) in the lower portion of the body, it moves upwards and afflicts the channels of circulation there and takes the function of Udana Vayu, gets lodged in the throat region and chest. In turn, this Vayu (vata) enters the channels of head resulting in bending and stretching of the body, jaws, neck and eyes. After causing contraction in these areas, Vayu (vata) causes coughing which can
be dry or can be with phlegm. Patient gets relief after a vega of kasa and there is no pain while coughing up a sputum. It makes the difference between the kasa vega and kasa as a swatantra vyadhi.

The word Kapha applies to both dosha and Rasa dhatu mala, in prakruta avasta it does its prakruta karma along with the help of Vata dosha, the relation between dosha, dhatu and mala can be well defined in regards to Kapha dosha that’s why it is called as Bala in prakrita avasta. But in vikrit avastha having mala roopi kapha our body expel out it from the lungs in the form of sthivana.

The functions of Pranavata is said to be production of Sthivana (sputum), Kshavathu (sneezing), Udagara (belching), Nishvasa (inspiration), Annapravesha (swallowing), Buddhi, Hrudaya, Indriya, chittadhruk (proper functioning of sense organs, heart, intelligence and mind). It can be seen as a prominent feature of Pranavaha strotodushti vikara (disease of Respiratory System) which occurs in the body as a result of the defective etiology.  

The action of expectoration of phlegm or mucus from the throat or lungs by coughing, hawking or spitting. Sputum examination refers to the substance coughed out from the lungs, bronchi, trachea, and larynx. Normally, sputum is mainly composed of mucus and also certain cellular and non-cellular components of host origin. During expectoration, sputum gets contaminated with normal bacterial flora and cells from pharynx and mouth.

According to NCMH (National Commission on Macroeconomics and Health) cough is a burden disease. The symptom of cough can be short lived or last years; cough can be defined as acute (lasting less than 3 weeks), Sub acute cough has (lasting for 3-8 weeks) and chronic (lasting more than 8 weeks). A cough may be dry or it may be productive with sputum. It is the most frequent symptom of respiratory disease for which medical consultation is sought.

In Ayurveda classics, there are very few references regarding Sthivana pareeksha (sputum examination). So this article mainly explains about both Ayurveda and Modern view regarding Sputum features in various diseases.

AIM AND OBJECTIVE:

AIM: To compare different types of sthivana with features of Sputum.

OBJECTIVE: (1) To analyze sthivana lakshanas in different vyadhis.

(2) To compare different lakshanas of sthivana with characters of sputum mentioned in modern medical science.

MATERIALS AND METHODS:

Ayurveda and contemporary texts and internet sources.
DISCUSSION:

Kapha dosha

“ken jalena phalati iti kaphah” Su.Su.21/8

Kapha is made up of udaka (water) in the body. The function of udaka is samyog (to bind), that’s why samyogkarta kapha is called sleshma.

Prakrit kapha dosha and karma

“Sleshma sthirtva snigdhtva sandhibandh kshamaadibhihi | ” A.H.Su. 11/3

Sleshma confers stability, lubrication, compactness of the joints, forbearance and such others. Kapha is called as bala and it is madhur (sweet) in taste in prakritavastha and Lavana (sour) rasatmaka in vikritavstha.

Features of increase in kapha

“ Svaitya shaitya kandu gaurava sneha supti kleda upadeha bandha madhurya chira karitvani shleshmanah karmanih tairanvitam shleshma vikar meva adyavasyet ” C.Su. 20/18

Various Kapha properties produce these features such as shukla (white) property gives rise to whitishness, Sheeta (cold) property gives rise to coldness, Guru (heavy) property can be seen as heaviness in the body. ‘Bandha and Uplepa’ (adhesive and coating) gunas of Kapha gives rise to features like strotas liptata (obstruction of channels), Dhamani Pratichaya (Atherosclerosis). It also leads to Sandhi Slishhtata (compactness of joints) and its Poshak(nutrition) property gives rise to obesity.

Vriddha kapha dosha karma:

“ Sleshma agnisadan praseka alasya gauravam
Svaitya shaitya shlatha angtvam svasa kasa atinindratah ” A.H.Su. 11/7

Agitated kapha dosha produces excess of saliva, mucous. Due to the reason by this further vikrti take places and agnisaad and others lakshanas can be seen. Svasa is seen because agitated kapha blocks the channels of vata and kasa is the protective reflux to clear the airway from excess of the kapha(mucous).

As vriddha kapha(agitated cough) hampers the function of Agni(digestive fire) there is a obvious production of Aam(undigested food particles) can be occurred.

General symptoms of Aam:

“Srotorodha balbhramsa gauravanila moodhatah
Aalasya apakti nisthiva malasanga aruchi klamah ” A.H.Su. 13/23-24
Acharya Vagbhatta clearly stated in above shloka that if there is occurrence of Ama in the body nishthivana (spitting) can be seen along with blockage of minute channels, lassitude, heaviness in the body and constipation.

**Sama kapha lakshamas:**

“Aavil satantulaha styaanah kanthdeshe avatisthate
Balaaso durgandhiihi kshududagara vidhyaakrit” A.H.Su.13/37-38

There is increased turbidity of balasa (kapha/ Phlegm/ Phlegmatic humour) which is thread, sticky, stagnates in throat, foul smell, complete loss of appetite and obstruct the eructations.

Commentator Dalhana of Sushruta-samhita defines some of these functions as follows.

1) Spitting sputum is sthivana (sputum).
   i.e. to forcefully clear tracheal and pharyngeal mucous.

As ‘kapha’ is mala of Rasa dhatu we can consider Saama Rasadhatu malaroopi kapha lakshana for examination of sthivana (sputum).

They are: 1) Shuska kapha - Dry cough
   2) Sa kapha - cough with sputum
   3) Sleshmanam pitta samsrushtham – Expectorates sputum mixed with pitta
   4) Bahulam madhuram snigdham nishthivati ghanam kapham- large amount of thick sputum comes out which is sweet in taste and unctuous.
   5) Durgandham haritam raktam sthivet pooyopamama kapham – sputum comes out mixed with pus, which yields foul smell, colour is green or red.
   6) Pichchhilama bahalam haritam svetapeetakam kasmano rasam yakshmi nishthivati kaphanugam – Patient of rajyakshma spits out sputum which is slimy, large in quantity, viscus, putrid smell, green, white or yellow in colour.

**Sputum expulsion, sneezing and belching –**

Mucous which is accumulated in airways of neck and thorax is expelled out through mouth is the function of pranavayu along with sneezing, belching, Inhalation, ingestion etc. Direction of Pranavayu could be from outside of body but direction of expectorating mucous is from inside out. Same direction is of belching, sneezing, too. Whenever there is any obstruction to its direction, clearance of obstruction is need to be immediate. As Pranavaha strotodushti (hampered Respiratory System function) conveys diseases affecting the Prana(life) This could be the reason of allotting functions like expulsion of mucus, sneezing, belching to pranavayu.
There is evidence that strongly suggests that reflux commonly provokes cough by stimulating an esophageal-bronchial reflex without aspiration. By irritating the lower respiratory tract by micro or macro aspiration, the cough reflex also can be stimulated. Gastro esophageal reflux disease (GERD) can potentially do it, too.

Management of obstructive airway diseases such as asthma, chronic obstructive pulmonary diseases (COPD) and other disorders is made easy by doing induced sputum analysis. Numerous studies has been demonstrated that it is non-invasive tool for the diagnosis of a disease. Its safety and efficacy is superior to previous techniques for determining airway inflammation. It is a noninvasive and highly reproducible approach in generating a measurable index of inflammatory cells in the airways of the lungs.

**Sputum Examination:**

Mucoid sputum is characteristic in patients with chronic bronchitis when there is no active infection, it is clear and sticky and not necessarily produced in a large volume. Sputum may become mucopurulent or purulent when bacterial infection is present in patients with bronchitis, pneumonia, bronchiectasis or a lung abscess. In these last two conditions, the quantities may be large and the sputum is often foul smelling. Occasionally asthmatics have a yellow tinge to the sputum, owing to the presence of many eosinophils. People with asthma may also produce a particularly tenacious form of mucoid sputum, and sometimes they cough up casts of the bronchial tree, particularly after an attack. Patients with bronchopulmonary aspergillosis may bring up black sputum or sputum with black parts in it, which is the fungal element of the Aspergillus. When sputum is particularly foul smelling, the presence of anaerobic organisms should be suspected. Very ill patients with pulmonary oedema may bring up pink or white frothy sputum. Rusty-coloured sputum is characteristic of pneumococcal lobar pneumonia. Blood may be coughed up alone or bloodstained sputum produced in bronchogenic carcinoma, pulmonary tuberculosis, pulmonary embolism, bronchiectasis or pulmonary hypertension (e.g. with mitral stenosis).

Sputum can be examined under the microscope in the laboratory for the presence of pus cells and organisms and may be cultured in an attempt to identify the causative agent of an infection and antibiotic resistance patterns sputum to be examined for acid-fast bacilli when appropriate; tuberculosis (TB) requires specialized techniques of laboratory microscopy and culture to identify the responsible organisms, and if the diagnosis is suspected, these tests must be specifically requested. Non-tuberculous mycobacteria (NTN) can occur in patients with chronic underlying lung pathology such as COPD and bronchiectasis.

**RELATION BETWEEN VARNA, JALANIMAJJANA PAREEKSHA AND SADHYASADHYATA (PROGNOSIS)**

Regarding prognosis of the disease in a patient based on varna (colour) of sthivana and jala nimajjana pareeksha (Test based on sinking or floating in water) in charaka samhita- Indriya
Sthana. Copious expectoration of sputum having blue, yellow or red colour from uras (chest), Physician should discard him from a distance. If sputum sinks in water when placed on it, he should be considered as moribund. If several colours appears in sputum of a person and if it sinks in water, he can not survive. 27

In some of the vyadhis sthivana can be seen in various type of character with modern comparison that can be seen in table no.1

**Table:1 PRESENTATION OF STHIVANA IN VARIOUS DISEASES**

<table>
<thead>
<tr>
<th>Vyadhi</th>
<th>Sthivana lakshanas</th>
<th>Modern diseases</th>
<th>Features of Sputum</th>
<th>Images</th>
</tr>
</thead>
</table>
| Raktadhatugat Jvara | Sarakta sthivana   | ?Lung carcinoma
 ?Tuberculosis | Haemoptysis (Blood tinged sputum) | ![Image](1) |
| Vataja Kasa      | Shuska             | Whooping cough
 Simple pulmonary 
 eosinophilia | Paroxysmal,
 Dry or unproductive | ![Image](2) |
| Pittaja Kasa     | Pita nishthivana   | Acute Bronchitis | Scanty, Viscid 
 & Yellow | ![Image](3) |
| Kaphaja Kasa     | Snigdha Ghana kapha | Chronic 
 Bronchitis | Nocturnal cough (with wheezing) | ![Image](4) |
<p>| <strong>Kshataja Kasa</strong> | <strong>Shuska, Sarakta sthivana</strong> | Bronchiectasis | Wet or productive, foul smelling, Viscid &amp; Yellow | <img src="image5.png" alt="Image" /> |
| <strong>Kshayaja Kasa</strong> | <strong>Harita Rakta Sapooya</strong> | Tuberculosis | White &amp; Mucoid | <img src="image6.png" alt="Image" /> |
| <strong>Urahkshata / Kshatkshina</strong> | <strong>Dusta, Bahumatra</strong> | Bronchiectasis | Wet or productive, foul smelling, Viscid &amp; Yellow | <img src="image7.png" alt="Image" /> |
| <strong>Rajayakshama</strong> | <strong>Pichchhila, Bahala, Vistra, Harit, Shwetpitam</strong> | Tuberculosis | More quantity of thick sputum | <img src="image8.png" alt="Image" /> |
| <strong>Kaphadhik Amlapitta</strong> | <strong>Kapha nishthivana</strong> | GERD (Gastro Esophageal Reflux Disease) | Nocturnal cough | <img src="image9.png" alt="Image" /> |</p>
<table>
<thead>
<tr>
<th>Apakva Peenasa</th>
<th>Kshama sthivana (Saama kapha)</th>
<th>Sinusitis / Rhinitis</th>
<th>Nocturnal cough</th>
</tr>
</thead>
</table>

**Miscellaneous:**

*Vayu kshina, Pitta Vayu kshina, Pitta Sama Kaphadhika- Pitatvam sthivana*(Yellowish Sputum)*-
Obstructive jaundice* 38

*Avirikta lakshana*(The one who has gone under virechanas)*- *Sthivana sleshmapittayo* 39

*20 Kaphaja vikara* (disorders of kapha)*- Sleshmodgirana* (Expectoration of mucous)

*Shosha- Shonitam sthivati* 40

*Unmada* - Phenagama Asyaat 41

*Apasmara*- Phenam vamana 42

*Nirama Kapha dosha lakshana* - Nirgandha, Phenavana, Chhedavana 43

**CONCLUSION:**

*Sthivana or nishtivana* is the end product of *Kasa* (cough). Kasa can be a either vega or vyadhi. One which produces the ‘*dukha*’ in *shaarir* (any kind of pain in body), with increased frequency of cough bouts, with the specific nidana and poorvarupa, associated lakshanas (symptoms) etc. will be considered as *Kasa roga*.

In classics there is a reference which shows if *Kasa*(cough) is present, definite *vikriti* of *kapha dosha* should be present. Symptoms which are present currently or which can be appreaciated in patient shows lot of similarities with the lakshanas mentioned in our classics. We have tried to correlate some of the important variations of nishtivana (sputum) with different types of expectoration i.e based on colour, consistency etc. Some of them are like characteristics of haemoptysis (blood tinged sputum) can be compared with sarakta sthivana which is appreaciated in Raktadhatugata Jvara as well as in urdhava raktaipitt, mouth is a place where dushta rakta is expelled out. In *Vataja Kasa Shuska nishtivana* occurs without mucus as it is seen in Whooping cough and Simple pulmonary eosinophilia etc.

Further such kind of interpretations in detail will help us in understanding different lakshanas (symptoms) and avasthas (stages) of kasa which will pave the way for better and early diagnosis and treatment.
REFERENCES:

1- A Textbook of Vikriti Vijnana & Roga Vijnana by Dr.Nisha Kumari, volume-2, Chaukambha Publications, Varanasi, Adhyaya 7th Diseases of Pranavaha Srotas-Kasa, pg no.337


3- PS Byadgi, Parameshwarappa’s Vikriti Vijnana & Roga by, volume-1, chep-9th, Chaukambha Samskrit Samsthan, New Delhi, 1st Edition, 2007, pg no- 199,204

4- Madhava Nidanam of Sri Madhavakara with The Madhukosa Sanskrit Commentary by Srimanjaryakrita and Srikandadatta with The Vidyotini Hindi Commentary and Notes by Sri Sudarsana Sastri, Revised & Edited by Prof. Yadunandana Upadhyaya, Part-1, Chaukambha Prakasan,Varanasi. Adhyaya 11th Kasanidanam, pg no. 304.


6- Charaka Samhita by Yadavji Trikamji Acharya, Chaukhamba publication,Varanasi, Chikitsa sthana adhyaya 18th Kasa chikitsitam shloka no. 16-17 pg no. 1250


10- Sputum definition- Medical Dictionary definitions of popular medical terms easily defined on MedTerms


12- http://www.hal.inserm.fr/inserm-00744419


15- Sushruta Samhita by Acharya Priyavata Sharma, Chaukhamba surbharti prakashana, Varanasi, Sutra sthana adhyaya 21th Vranaprasnaadhyaya, Shloka 8th pg no.179

16- Ashtang Hridayam, Sutrasthana, adhyaya 11th in shloka 3rd shreemahavagbhatta virachitam, Sarvagsundara vyakhya, pratiskarta- Pandit Hari Sadashiv Shastri Paradkara, chaukhamba surbharti Prakashan, Varanasi, pg no. 182

17- Charaka Samhita by Yadavji Trikamji Acharya, Chaukhamba publication,Varanasi, Sutra sthana adhyaya 20th Maharogaadhyaya, Shloka 18th.

18- A Textbook of Vikriti Vijnana & Roga Vijnana by Prof. Dr.Subhash Waghe, Rashtra Gaurav publications, 1st Edition 2019 volume-1paper-1, pg no- 24

19- Ashtang Hridayam, Sutrasthana, adhyaya 11th in shloka 7th shreemahavagbhatta virachitam, Sarvagsundara vyakhya, pratiskarta- Pandit Hari Sadashiv Shastri Paradkara, chaukhamba surbharti Prakashan, Varanasi, pg no. 183
20- Ashtang Hridayam, Sutrasthana, adhyaya 13th in shloka 23-24 shreemahavagbhatta virachitam, Sarvangsundara vyakhya, pratiskartar- Pandit Hari Sadashiv Shastri Paradkara, chaukhambha surhbhrti Prakashan, Varanasi, pg no. 226

21- Ashtang Hridayam, Sutrasthana, adhyaya 11th in shloka 37-38shreemahavagbhatta virachitam, Sarvangsundara vyakhya, pratiskartar- Pandit Hari Sadashiv Shastri Paradkara, chaukhambha surhbhrti Prakashan, Varanasi, pg no. 229

22- A critical analysis on Sleshma Pareeksha w.s.r. to Sputum test: A review

23- A Textbook of Vikriti Vijnana & Roga Vijnana by Prof. Dr.Subhash Waghe, Rashtra Gaurav publications, 1st Edition 2019 volume-1 paper-1, pg no- 24

24- Sputum analysis in diagnosis and management of obstructive airway diseases
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1661627

25- Charaka Samhita by Yadavji Trikamji Acharya , Chaukhamba publication,Varanasi, Sutra sthana adhyaya 20th Maharogaadhyaya, pg no- 115


27- Pranavayu a physiological understanding : A Review
http://iamj.in/posts/images/upload/3094_3097_1.pdf

28- Image 1-
https://i.imgur.com/PbdBoQH.jpg

29- Original Sthivana picture of a patient of Vataja Kasa from OPD in Parul Ayurved Hospital.

30- Image 3

31- Image 4

32- Image 5
https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.reddit.com%2Fcomments%2FkDocs%2Fcomments%2F5x09s%2Fhow_long_after_smoking_cessation_until_phlegm_is%2F&psig=AOvVaw0ce1ABPjo1iV4HGE-UJyal&ust=1604289063587000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCJChn9244OwCFQAAAAAdAAAAABAD

33- Image 6
34- Image 7

35- Image 8

36- Image 9

37- Image 10

38- Charaka Samhita by Yadavji Trikamji Acharya , Chaukhamba publication,Varanasi, Sutra sthana adhyaya 17th Kiyantahsirahshiraseeyad adhyaya, Shloka 51-52 on pg no. 344
39- Charaka Samhita by Yadavji Trikamji Acharya , Chaukhamba publication,Varanasi, Sutra sthana adhyaya 16th Chikitsaprabhutriya adhyaya, Shloka 7-8 on pg no. 320.
40- Charaka Samhita by Yadavji Trikamji Acharya , Chaukhamba publication,Varanasi, Nidana sthana adhyaya 6th Shosha nidana, Shloka 4,8,10 on pg no. 219.
41- Charaka Samhita by Yadavji Trikamji Acharya , Chaukhamba publication,Varanasi, Nidana sthana adhyaya 7th Unmada nidana, Shloka 6(1) on pg no. 223.
42- Charaka Samhita by Yadavji Trikamji Acharya , Chaukhamba publication,Varanasi, Nidana sthana adhyaya 8th Shosha nidana, Shloka 7(1) on pg no. 226.
43- Bhavprakash by Bhavmisra, in pratham khnda adhyaya 1st in shloka 55th pg no. 73.