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Conceptual Study on *Vataja Kasa* as Pulmonary Eosinophilia: A Critical Review

Author: Manjushri P¹

Co Authors: Gopala Krishna G²

^{1,2}Department of Kayachikitsa, Sri Sri College of Ayurvedic Science and Research, Bengaluru, Karnataka, India

ABSTRACT

Eosinophilic inflammation is one of the hallmarks of allergic disease, and accumulation of eosinophils in affected tissues is a feature of diseases such as allergic rhinitis, asthma etc. Pulmonary Eosinophilia (PE) is pulmonary infiltration with increased eosinophilic count in peripheral blood. Environmental pollutants are shown to have alarming consequences for human health and they have important effects related to environmental pollution and the origin of hypersensitivity and pollen allergy. *Vataja Kasa* (~cough caused by *Vata dosha*) which is stated to be caused due to *Dhumopaghata* (~affected by Smoke), *Rajah sevana* (~inhalation of dust, pollen) can be understood as Pulmonary eosinophilia to diagnose and manage the disease effectively in a clinical setup. Hence, there is a need to understand etiology, clinical features, diagnosis and management of *Vataja Kasa* in relation to PE. Dry paroxysmal cough, myalgia, chest pain, flanks pain etc are the main clinical features of *Vataja Kasa*. Investigations, history taking, clinical features are necessary to establish the diagnosis. Interventions used for PE are anthelmintics, anti-inflammatory and corticosteroids which have adverse effects and reoccurs if medicines are discontinued. Here *Ayurveda* (~science of life) have a role in treating PE with *Krimigna* (~medicine which kills worms), *Shodhana* (~detoxification therapy), *Kasashwasahara* (~therapy which alleviates respiratory disease) drugs and *rasayana chikitsa* (~rejuvenation therapy).

Key Words Absolute eosinophilic count, *Dhumopaghata*, hypersensitivity, Pulmonary Eosinophilia, *Vataja Kasa*

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INTRODUCTION

Air pollution, tobacco smoking, allergens, occupational risks are the leading cause of respiratory diseases. As per recent data, in 2019, chronic respiratory diseases were the third leading cause of death responsible for 4.0 million deaths with a prevalence of 454.6 million cases globally¹. In recent era, Urbanization with its

high levels of vehicle emissions, and a westernized lifestyle are linked to the rising frequency of respiratory allergic diseases in industrialized countries. Climate change together with exposure to environmental pollutants has been shown to have alarming consequences for human health and it has important effects related to environmental pollution and the origin of

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hypersensitivity and pollen allergy. Air pollution plays an inflammatory role in the airways of predisposed patients². *Vataja Kasa* is one such respiratory disorder which can be seen more as a phenotype of obstructive pulmonary diseases. *Shushka Kasa* (~Dry Cough) is the main cardinal symptom of *Vataja kasa*. It occurs as a result of *pranavaha srotodushti* (~causes of deformity in channels of respiratory system), which is caused mainly by *raja*, *dhumopaghata*. Pulmonary Eosinophilia occurs due to parasitic infestation, hypersensitivity and IgE mediated immune response.

AIMS AND OBJECTIVES

- To understand etiology and clinical features of *Vataja Kasa* in relation to Pulmonary eosinophilia
- Diagnosis and management of *Vataja Kasa* with special reference to Pulmonary Eosinophilia.

MATERIALS

Literature pertaining to *Vataja Kasa* from *Ayurvedic* classical literatures, Pulmonary eosinophilia from contemporary texts and reputed journals are referred to gather information.

METHODOLOGY

Kasa:

Kasa (~cough) word is a masculine gender and taken from the root “*kasru*” which means “unpleasant sound”, “broken bronze sound”.

Kasa is derived from the root of “*kas*” which is used for *Gati* (~movement) and *Shatana* (~discomfort), where it refers to *Urdwagathi* (~upward movement) and discomfort, weakness in *urah pradesha* (~thorax region) respectively³. *Paribhasha* (~definition) of *Kasa* is release of obstructed *vayu* resulting in the production of abnormal sound in the form of productive or dry cough³. *Acharya Dalhana* says *Kasa* means forceful expulsion of the *prana vayu* (~a type of *vata dosha*) resulting in the production of sound resembling that of a broken bronze vessel is called *Kasa*⁴.

Vataja Kasa

Vataja kasa is a type of *Kasa*, enumerated in detail in *Bruhatrayees* and *Laghutrayees*. Separate *Nidana* (~etiology), *lakshana* (~signs and symptoms) and *chikitsa* (~treatment) mentioned for *vataja kasa* depicting its importance in terms of management which differs for each type. *Kasa* is explained as a associated symptom, complication, premonitory symptom and disease.

Etio-pathogenesis of Vataja Kasa

The cordial relationship between *Prana vata* and *Udana Vata* is essential for normal functioning of both in *kanta* and *ura pradesha*. The factors which alter the normal functions, can lead to manifestation of *Kasa*.

Acharyas mentioned *Rajah sevana*, *Dhumopaghata* as common *nidana* for manifestation of *Kasa* along with other causes like *Bhojanasya vimarga gatva* (~regurgitation of food), *Vegaavarodha* (~holding natural urges),
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Vyayama (~exercise), Kshavathu dharana (~holding sneeze), Rukshanna sevana (~eating dry foods)⁴. This is also applicable for Vataja Kasa.

Acharya Charaka enumerated specific etiology for Vataja Kasa as Kshavatu vegadharana, Atimaituna (~excessive coitus), Ruksha ahara, Sheeta ahara (~cold food articles), Kashaya ahara (~eatables which are astringent in taste), Alpa ahara sevana (~eating in very less quantity), Pramitaashana (~less than normal quantity of diet), Anashana (~not eating food), Aayasa (~fatigue)⁵.

Samprapti of Vataja Kasa:

Samprapti (~pathogenesis) deals with pathological process of a disease which explains starting from dosha dusti (~vitiation of dosha), their spread and manifestation of the disease. In chikitsa much importance has been given for Samprapti Vighatana (~breaking pathogenesis) achieved by “Samprapti Vighatana meva Chikitsa” (~treatment which breaks the pathology). Vataja Kasa samprapti is shown in Figure 1.

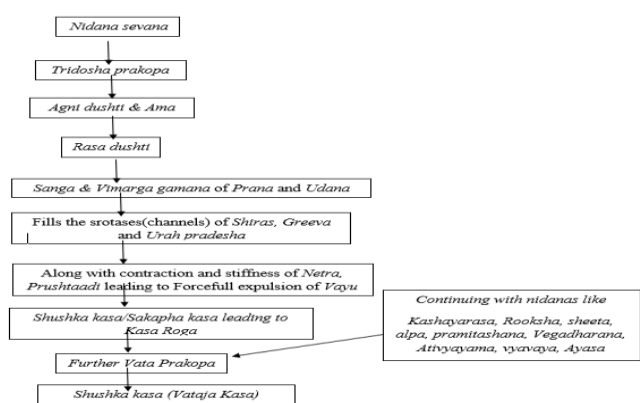


Figure 1 Samprapti of Vataja Kasa

Samprapti ghataka:

- ❖ Dosh- Vata pradhana tridosha
- ❖ Dushya- Rasa
- ❖ Agni- Jataragni dushti
- ❖ Srotas- Rasavaha, Pranavaha.
- ❖ Srotodusti- Sanga & Vimargagamana
- ❖ Udbhava sthana- Amapakvashaya.
- ❖ Sanchara sthana- Rasayani.
- ❖ Adhithana- Pranavahasrotas (Uraha, Kanta)
- ❖ Vyaktha sthana- Uraha, kanta, shira, parshwa.
- ❖ Rogamarga- Abhyantara.
- ❖ Swabhava- Chirakari
- ❖ Sadhya asadhyata- Krichrasadhya

Purvarupa and Lakshana:

Purvarupas (~premonitory symptoms) mentioned as Shukapurna gala-asyata (~feeling of thorns in throat and oral cavity), kante kandu (~throat itching), Bhojyanam avarodha (~difficulty in swallowing)³.

Lakshanas highlited are Shushka Kasa (~Dry cough), Prasakta vega (~paraoxysmal cough), Shirashula (~headache), Parshwa shula (~flanks pain), Hrit shula (~chest pain), Swarabheda (~hoarseness of voice), Dourbalya (~fatigue), Moha (~confusion), Shushka kanta (~dryness in throat), Anga harsha (~horripilation), Kshobha (~irritation), Snigdha, Amla, lavana bhukta peeta prashamyati (~reduction of symptoms on intake of unctuous, sour, salty food), Urah shula (~pain in thorax)⁵.

Upadrava:

Due to negligence or improper care, the condition developing in the bhedavasta (~a stage of November 10th 2023 Volume 19, Issue 3 **Page 30**

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kriyakala) of a disease is termed as *upadrava* (~complication). *Jwara* (~fever), *Arochaka* (~anorexia), *Swasa* (~shortness of breath), *Svarabheda*, *Kshaya* (~emaciation) and *Chardi* (~vomiting) are explained as complications of *Vataja Kasa*⁶.

Table 1 Treatment of *Vataja Kasa*⁷

	Shodana	Shamana	Avasthika Chikitsa
Abhyantara (internally)	<i>Sneha Basti</i> (unctuous enema)	<i>Sneha Gritha</i> (ghee), <i>Peya</i> , <i>Yusha</i> , <i>Ksheera</i> , <i>Rasaadi Prayoga</i> , <i>Lehya</i> , <i>Dhooma</i>	<ul style="list-style-type: none"> ▪ Associated with <i>pitta</i> and <i>Shushka urdhwa deha</i>(dryness of upper part of body) – <i>Ghritha</i> given after food. ▪ Associated with <i>Kapha</i> & <i>shushka urdhwa deha</i> – <i>Sneha virechana</i>(unctuous purgation). ▪ <i>Mala vibhandha</i> (obstruction for excretion of waste products)– <i>Anuvasana Basti</i>(oil enema) <i>Krimi</i>(worms)- <i>Krimigna oushadhi</i>
Bahya (externally)	<i>Sthanika Abhyanga</i> (local body massage), <i>Parisheka</i> (pouring medicated liquid), <i>Sweda</i>		

Table 2 Shamana Yogas⁷

Churna Yogas	Lehyas	Ghritha Yogas	Dhooma Yogas	Other Yogas
<i>Dhanyadi choorna</i>	<i>Agasthya haritaki</i>	<i>Kantakaryadi ghritha</i>	<i>Haratala Dhooma</i>	<i>Akshadi vataka</i>
<i>Hingwadi choorna</i>	<i>Chitrakadi leha</i>	<i>Pippalyadi ghritha</i>	<i>Manashiladi Dhooma</i>	<i>Aladhi gutika</i>
<i>Pathyadi choorna</i>	<i>Duralabhadi leha</i>	<i>Rasna ghritha</i>	<i>Prapoundarikadi Dhooma</i>	<i>Dashamula kwatha</i>
<i>Vidangadi choorna</i>	<i>Dusparshadi leha</i>	<i>Vyoshadi ghritha</i>		<i>Panchakola Ksheera</i>
	<i>Nagaradhi leha</i>			<i>Shringavera swarasa</i>
	<i>Vamshalochanadi leha</i>			<i>Krimikutara rasa</i>
	<i>Vidangadi leha</i>			

Pulmonary Eosinophilia

Pulmonary eosinophilia (PE) is the infiltration of eosinophils into the lung compartments constituting airways, interstitium, and alveoli⁸. It is a clinical term used to describe the association of radiographic lung opacities and blood eosinophilia and is a immunologically-mediated lung disease⁹.

Eosinophilia is the presence of >500 eosinophils per μ L of blood and is common in many settings besides parasite infection. A common cause of eosinophilia is allergic reaction to drugs (iodides, aspirin, sulfonamides, nitrofurantoin, penicillins, and cephalosporins). Allergies such as hay

Chikitsa:

In *vataja kasa* almost all the *Acharyas* suggests *snehana* procedure and *ahara kalpanas* (~food preparations) like *yusha* (~soup), *yavagu* (~gruel) etc. Management of *Vataja Kasa* is shown in detail in Table 1, 2.

fever, asthma, eczema, serum sickness, allergic vasculitis, and pemphigus are associated with eosinophilia. The most dramatic hypereosinophilic syndromes are Loeffler's syndrome, tropical pulmonary eosinophilia, Loeffler's endocarditis, eosinophilic leukemia, and idiopathic hyper-eosinophilic syndrome¹⁰.

Etiology:

Etiologically, pulmonary eosinophilia may be classified as cryptogenic or of known cause. In patients the cause of the pulmonary eosinophilia is not recognised such cases are categorised as suffering from cryptogenic pulmonary

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eosinophilia. A majority of these patients are atopic, giving a history of rhinitis or asthma⁹.

Known Causes of Pulmonary eosinophilia are as follows¹¹

- ❖ Hypersensitivity response due to drugs, Pollen, other fungi and antigens
- ❖ PE due to human filarial infections/other parasitic infections
- ❖ Allergic broncho-pulmonary aspergillosis
- ❖ Asthmatic PE
- ❖ Chrug-strauss syndrome
- ❖ Cryptogenic eosinophilic pneumonia
- ❖ Hypereosinophilic syndrome

Pathophysiology¹²

Activation of Eosinophils



Results in degranulation with extracellular release of eosinophil-specific proteins like MBP (Major basic protein), eosinophil-cationic protein, eosinophil derived neurotoxin, EPO (enzymatic protein eosinophil peroxidase)



Eosinophils also release pro-inflammatory cytokines, arachidonic acid-derived mediators, enzymes, reactive oxygen species, and matrix metalloproteases



They express a variety of surface protein



Hence the release of toxic substances in itself contributes to pathophysiology of eosinophilic disorders

Classification:

Classification of Eosinophilic lung diseases is shown in Table 3.

Non asthmatic eosinophilic bronchitis (NAEB)¹³

It is characterized by cough for at least 2 months, a sputum eosinophil counts greater than 3% and no evidence of airway obstruction. Environmental or occupational factors may be responsible for this situation. Affected patients are usually middle-aged, are nonatopic, and have no history of smoking. Activation and eosinophilic infiltration of the superficial airway occurs, rather than of airway smooth muscle.

Clinical presentation of pulmonary eosinophilia:

Methodical history taking to label pulmonary eosinophilia as intrinsic or extrinsic or idiopathic is important. Physician should evaluate for respiratory symptoms namely dry Cough, dyspnoea, wheezing, chest pain, rare pulmonary presentations like consolidation, cavitation, pneumothorax, bronchiectasis and systemic symptoms such as myalgia, abdominal discomfort, fatigue, weight loss.

Investigations:

Laboratory investigations helps to confirm the diagnosis, though much can be diagnosed based on the clinical signs and symptoms. Following tests can be carried out namely, routine blood investigations like TLC, DLC, Hb%, ESR helps to rule out, anemia and eosinophilia, etc.

Absolute eosinophilic count to rule out allergic factor, stool examination for evidence of

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Helminthic ova, sputum smear examination, culture of sputum where ever necessary. Chest Radiograph may help to indicate the presence and extent of inflammation. Bronchoscopy or laryngoscopy may be used to inspect the interior of bronchi and larynx, when a physician can't come to a conclusion with Radiograph.

Management:⁸

Management of pulmonary eosinophilia depends on the severity of symptoms and the exact diagnosis. Infection must be excluded prior to commencing corticosteroids which are very effective in reducing the peripheral eosinophil count within hours. In a patient with risk factors and positive serology for parasites, an empiric trial of mebendazole can be given. In Non-asthmatic eosinophilic asthma, cough responds to inhaled corticosteroid treatment with anti-inflammatory drugs. Diethylcarbamazine is the drug of choice for tropical pulmonary eosinophilia. Ascariasis is treated with oral mebendazole or albendazole. Strongyloides is treated with ivermectin, even if only antibodies are found to be positive, due to the risk of hyperinflation in the future. In acute and chronic eosinophilic pneumonia, intravenous corticosteroids respond very well to corticosteroids, with an improvement in symptoms and the radiological opacities within days to weeks.

DISCUSSION

Pranavaha srotodushti leads to derangement in respiration like *Ati srushta shwasa* (~prolonged breathing) and *Ati baddha Shwasa* (~too short breathing) etc., and leads to manifestation of diseases like *Shwasa, Kasa*. Thus, *Vataja Kasa* which comes under *Kasa* is a respiratory system disorder.

Dhumopaghata, Rajah Sevana are mentioned as etiology of *Vataja Kasa*. *Dhumopaghata* can be elicited as tobacco smoking, industrial and automobile fumes whereas *Rajah sevana* as Industrial dusts, cotton fiber dust etc.

Clinical features of *Vataja Kasa* such as dry Paroxysmal cough, chest pain, fatigue, myalgias in form of flanks pain, headache are seen in Pulmonary eosinophilia.

Complications mentioned for *Vataja Kasa* such as *Jwara, Swasa, Svarabheda, Arochaka* are seen as complication of pulmonary eosinophilia as seen in pneumonia.

Diagnosing a case of cough should be based on history taking to identify the etiology, clinical features, and investigations like Absolute eosinophilic count, Serum IgE to rule out hypersensitivity or allergic factor.

Management of pulmonary eosinophilia in contemporary science is based on etiology, use of corticosteroids to reduce immune reactions and symptomatic management which has many adverse effects and tends to reoccur on discontinuation of medicine. Thus, *Ayurveda* have scope by doing *Snehana* (~unctuous therapy), *Swedana* (~Sudation), *Shodhana, Samshama* (~palliative medicines), *Krimigna*

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chikitsa to cure the disease as well as to prevent the reoccurrence of disease.

CONCLUSION

Based on etiology, clinical features and with support of investigations like Absolute eosinophilic count, serum IgE and Chest x-ray, clinically *Vataja Kasa* can be diagnosed as Pulmonary eosinophilia. Hypersensitivity should be treated keeping it as main area of focus. It can be well managed with *Kasashwasahara*, *Krimigna* drugs, *Rasayana*, immuno-modulatory drugs and *Shodhana* to prevent the reoccurrence.

Conflict of Interest: None

Source of Funding: None

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REFERENCES

1. Momtazmanesh S, Moghaddam SS, Ghamari SH, Rad EM, Rezaei N, Shobeiri P, et al.(2023). Global burden of chronic respiratory diseases and risk factors, 1990–2019: an update from the Global Burden of Disease Study 2019. *eClinicalMedicine* [Internet], 59, 101936.
 2. D'Amato, G., Chong-Neto, H. J., Monge-Ortega, O. P., Vitale, C., Ansotegui, I. J., Rosário, N., Haahtela, T., Galán, C. R., Pawankar, R., Murrieta-Aguttes, M., Cecchi, L., Bergmann, C., Ridolo, E., Ramón, G., Díaz, S. G., D'Amato, M., & Annesi-Maesano, I. (2020). The effects of climate change on respiratory allergy and asthma induced by pollen and mold allergens. *Allergy*, 75(9), 2219–2228. <https://doi.org/10.1111/all.14476>
 3. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala Krit, edited by Vaidya Jadavji Trikamji Acharya. Chikitsa Sthana. Ch.18, Ver. 5-8. Varanasi: Chaukhambha Surbharati Prakashan; 2020. p. 540.
 4. Sushruta, Susruta Samhita of Susruta, Dalhana krit, edited by Vaidya Jadavji Trikamji Acharya, Uttara tantra. Ch. 52, Ver. 4-5. Chaukhambha Sanskrit Sansthan; 2015. p. 765.
 5. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala Krit, edited by Vaidya Jadavji Trikamji Acharya. Chikitsa Sthana. Ch.18, Ver. 10-13. Varanasi: Chaukhambha Surbharati Prakashan; 2020. p. 540-1.
 6. Sri Brahma Sankara Misra. (1941). Bhavaprakasha of Sri Bhavamisra, Madyama Khanda, Ch. 12, (part 2). Chaukhambha Sanskrit Series Office, p.160-7.
 7. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala Krit, edited by Vaidya Jadavji Trikamji Acharya. Chikitsa Sthana. Ch.18, Ver. 32-82. Varanasi: Chaukhambha Surbharati Prakashan; 2008. p. 541-2.
 8. Corrin, B., & Nicholson, A. G. (2011). *Pathology of the lungs E-book: Expert consult: Online and print*. Elsevier Health Sciences.
 9. Kasper, D. L., Braunwald, E., Fauci, A. S., Hauser, S. L., Longo, D. L., & Jameson, J. L. (2018). *Harrison's manual of medicine* (20th ed.). McGraw Hill Professional.
 10. Munjal, Y. P., & Sharm, S. K. (2008). *API textbook of medicine, two volume set* (8th ed.). JP Medical.
 11. Mason, R. J., Broaddus, C.V., Murray, J. F., Nadel, J. A., Lazarus, S.C., et.al (2016). Murray and Nadel's Textbook of Respiratory Medicine (6th ed). Elsevier.
- Pulmonary Eosinophilia: Background, Pathophysiology, Etiology. 2023 Jun 30 [cited 2023 Jul 23]; Available from <https://emedicine.medscape.com/article/301070-overview>.