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Research Article

DIAGNOSTIC EVALUATION OF *DOSHAJA KASA* W.S.R TO HEMATOLOGICAL INVESTIGATIONS

Agnihothram Venkata Ananda Vardhan[1], Subash Chandra Bose. M[2*]
[1]P.G.Scholar, *[2]Professor & H.O.D, Dept of Roganidana, J.S.S.Ayurveda Medical College & Hospital, Mysuru, Karnataka, India.

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***Address for correspondence**
Dr.Subhash Chandra Bose.M
Professor & H.O.D,
Dept of Roganidana,
J.S.S.Ayurveda Medical College & Hospital, Mysuru, Karnataka, India.
Email: scbmysore@gmail.com
Mob: 9886176690

ABSTRACT

Kasa is one of the commonest complaints in day to day life and clinical manifestation affecting *Pranavaha Srotas*. Among the five major types of *Kasa* mentioned by Acharyas*, Vata, Pitta* and *Kaphaja Kasa* have distinct and significant clinical features and *Samprapti*. Early intervention is necessary in case of *Kasa* as it is a potential *Nidanarthakara Vyadhi* (disease having tendency to produce secondary diseases) to produce *Kshaya.*

This observational study involving 150 subjects of age group 16 to 60 was carried out to assess the utility of hematological investigations (T.C, D.C, AEC, and ESR) to diagnose *Vata, Pitta* and *Kaphaja Kasa* respectively. Assessment of type of *Kasa* was done by scoring system of classical symptoms and changes in laboratory parameters were noted for each. Results are drawn based on statistical evaluation of each type of *Kasa* with respect to each of the hematological investigation involved in the study. Investigations like neutrophil count, absolute eosinophil count and lymphocyte count have shown significant association with respect to *Vataja*, *Pittaja* and *Kaphaja Kasa.*

INTRODUCTION

Respiratory system is in continuous contact with the external environment since birth until one's lifetime, so it is most vulnerable to infections and considered as the prime victim of hyper sensitization in most of the circumstances. *Kasa* is a disease explained in Ayurveda which involves presentations of a respiratory tract disease. Among many such diseases *Kasa* is one such clinical manifestation affecting *Pranavaha Srotas* increasingly prevalent now days, demanding greater concern over it.

***Kasanat Kasa* -** That which has sudden movement or exit from the head and throat is defined as *Kasa*[1]. *Vataja, Pittaja* & *Kaphaja Kasa* are the primary three types of *Kasa* mentioned by *Acharyas*. Though there are many subjective parameters to assess *Kasa*, diagnosis becomes more authentic by objective parameters. Objective parameters play an equally vital role in diagnosis of a disease along with subjective parameters. Hematology is the branch of medicine involving study of the blood. While medical and scientific testing has made diverse strides in recent years, many diagnoses of specific illnesses and disorders are made via blood analysis. Proper examination of blood cells can yield valuable information for patients needing advice on treatment.

Hence this study is an effort to assess the utility of hematological investigations in diagnosis of *Doshaja Kasa (Vata, Pitta, Kaphaja).*

AIMS AND OBJECTIVES

- ✓ To diagnose *Vata, Pitta* & *Kaphaja Kasa* based on classical clinical features.
- ✓ To establish the relationship between *Vata, Pitta, Kaphaja Kasa* and hematological investigations and assess the utility of hematological investigations in diagnosis of *Doshaja Kasa*.

MATERIALS AND METHODS

Diagnostic criteria [2-4]

Subjects of *Kasa* diagnosed with following *Lakshanas* and of acute origin of cough with duration less than 15 days were selected.

S.no	Type of *Kasa*	*Lakshanas*	Duration
1)	*Vataja*	A. *Shushka Kapha Krichranmukta alpatam Vrajet*	
		B. *Shushka Kaasa*	
		C. *Nirghosha*	
		D. *Hrit, Parshwa, Ura, Shira, Shanka, Udara shoola*	
		E. *Kshaamananha*	
		F. *Angaharsha*	
2)	*Pittaja*	A. *Peetanishteevana*	
		B. *Pratatam Kasavegena*	
		C. *Jyoteemsheeva Cha Pashyati*	
		D. *Urovidaha*	
		E. *Paridahyamaana*	
		F. *Tiktasyata*	
		G. *Bhrama*	
		H. *Moha*	
		I. *Vaktrashosha*	
		J. *Daha*	
		K. *Jwara*	
3)	*Kaphaja*	A. *Bahulam, Madhuram Snigdham, Nishteevati Ghanam Kapham*	
		B. *Kasamanohi Arug Vakshaha*	
		C. *Alpa Ruk* in *Ura, Murdha*	
		D. *Alpa Ruk* in *Hridaya*	
		E. *Mandagni*	
		F. *Aruchi*	
		G. *Chardi*	
		H. *Peenasa*	
		I. *Utklesha*	
		J. *Gourava*	
		K. *Lomaharsha*	
		L. *Asya Madhuryata*	
		M. *Sadana*	

Selection of Subjects

Inclusion Criteria

- ✓ Subjects of either gender between the age group of 16-60 years were selected.
- ✓ Subjects with history of *Vata, Pitta, Kaphaja Kasa* as per the *Lakshanas* mentioned in classics were taken for the study.

Exclusion Criteria

Other respiratory disorders like- *Kshataja & Kshayaja Kasa*, Bronchiectasis, Pleural effusion, Lung abscess, Pulmonary Tuberculosis.

Assessment Criteria

Subjective Criteria

1. Subjects fulfilling the diagnostic criteria.
2. Characteristics of sputum– (color, volume, odor, any other unusual findings)

Objective Criteria

1. Hematological investigations– TC, DC
2. Absolute Eosinophil Count
3. Erythrocyte Sedimentation Rate

Study Design

- ✓ 150 subjects who fulfilled the inclusion criteria were selected for the study.
- ✓ Subjects were examined in detail: symptoms were assessed based on the *Lakshanas* of *Vata, Pitta, Kaphaja Kasa* mentioned in Ayurveda Classics.
- ✓ Study was conducted by analyzing the subjective and objective parameters of *Vata, Pitta, Kaphaja Kasa*.
- ✓ Subject's venous blood sample was analyzed for TC, DC, AEC & ESR by using standard methodology.
- ✓ Obtained results from the above examinations and investigations were critically analyzed for evaluation of *Doshaja Kasa*

Statistical Analysis

- ✓ Data collected was entered in MS-Excel and analyzed using SPSS version 23.
- ✓ Data is represented as tables and graphs as relevant.
- ✓ Chi square test was applied for the data to assess the association between subjective and objective parameters.
- ✓ Obtained results were interpreted statistically significant at $p<0.05$.

Grading Pattern

- ➢ Each of the *Doshaja Kasa* were graded on severity in to low, moderate and high based on number of *Lakshanas* present i.e., for

Vataja Kasa

1-2 *Lakhanas* – low

3 - 4 – Moderate

>4 – Severe

Pittaja Kasa

1 - 3 – Low

4-6 – Moderate

More than 7– Severe

Kaphaja Kasa

1-3 *Lakshanas* – low

4 – 6- Moderate

More than 7– Severe

- ➢ The selected objective criteria's (T.C, D.C, A.E.C, E.S.R) were also categorized in to low, normal and high based on their laboratory values.
- ➢ Now chi-square test is applied between (low, moderate and high) severity of *Kasa* and (low normal and high) values of hematological investigations to assess the association between the subjective and objective parameters and to know the significance of the selected hematological investigations in diagnosing *Doshaja Kasa*.

RESULTS

Table 1: Relation between Neutrophils and *Doshaja Kasa*

Type of *Kasa*		Neutrophil			Chi square	P value
		Low	Normal	High		
Vata	Low (28.0%)	0	9 (18%)	5 (10%)	6.553	.038
	Moderate (64.0%)	0	30 (60%)	2 (4%)		
	High (8.0%)	0	3 (6%)	1 (2%)		
Pitta	Low (78.0%)	1 (2%)	37 (74%)	1 (2%)	1.447	.836
	Moderate (20.0%)	1 (2%)	9 (18%)	0		
	High (2%)	0	1 (2%)	0		
Kapha	Low (34%)	0	17 (34%)	0	.625	.731
	Moderate (62%)	1 (2%)	30 (60%)	0		
	High (4%)	0	2 (4%)	0		

Graph 1: Relation between Neutrophils and *Doshaja Kasa*

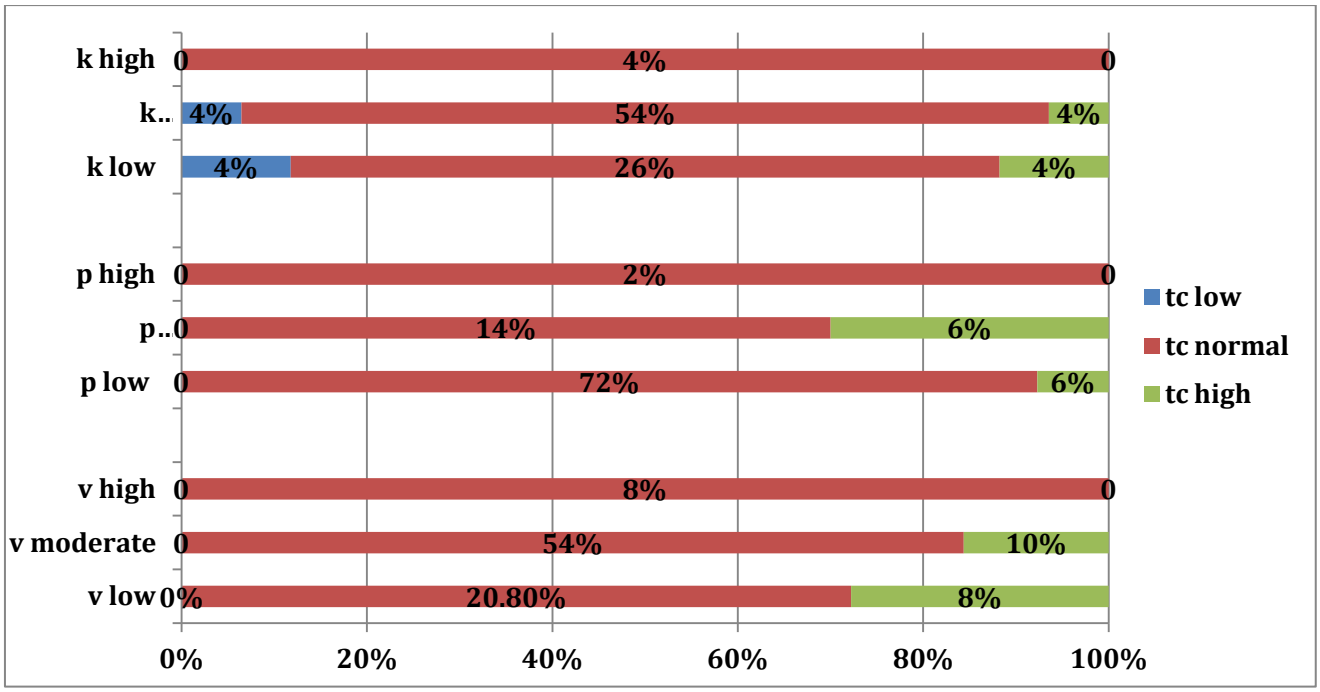


Table 2: Relation between A.E.C and *Doshaja Kasa*

Type of *Kasa*		A.E.C		Chi square	P value
		Normal	High		
Vata	Low (28.0%)	9 (18%)	5 (10%)	.187	.911
	Moderate (64.0%)	22 (44%)	10 (20%)		
	High (8.0%)	3 (6%)	1 (2%)		
Pitta	Low (78.0%)	35 (70%)	4 (8%)	7.483	0.024
	Moderate (20.0%)	9 (18%)	1 (2%)		
	High (2%)	0	1 (2%)		
Kapha	Low (34%)	17 (34%)	0	.625	.731
	Moderate (62%)	30 (60%)	1 (2%)		
	High (4%)	2 (4%)	0		

Graph 2: Relation between A.E.C and *Doshaja Kasa*

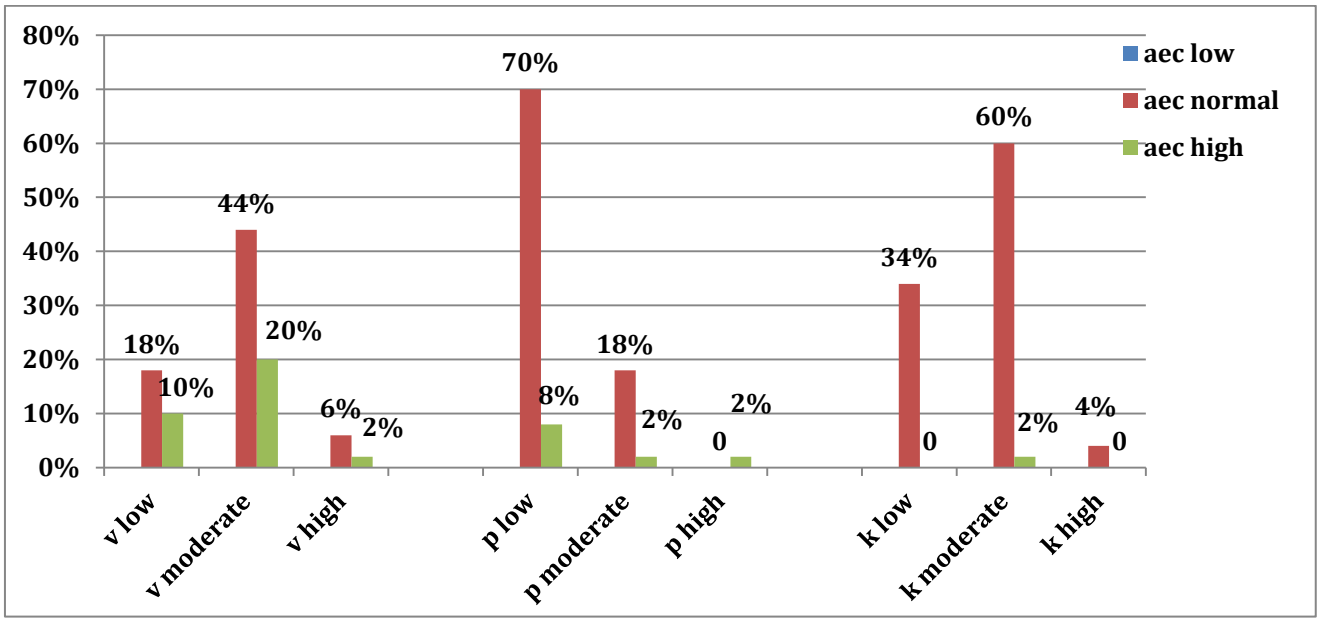
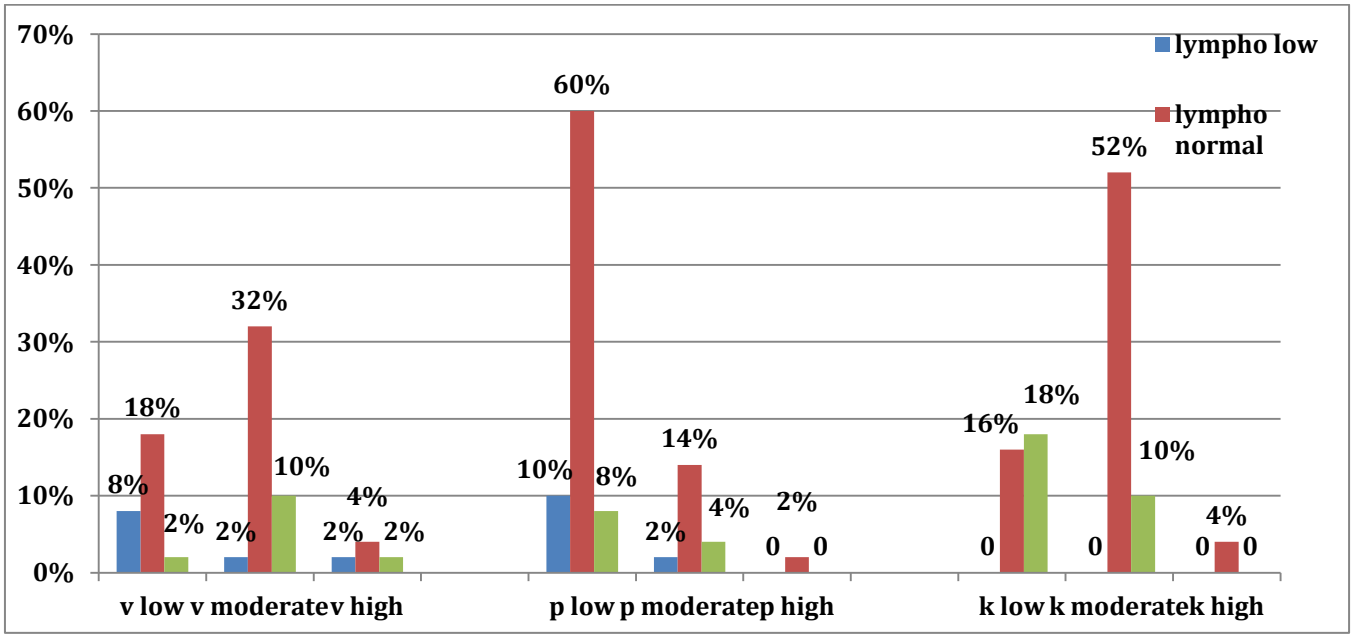


Table 3: Relation between Lymphocytes and *Doshaja Kasa*

Type of *Kasa*		Lymphocytes			Chi square	P value
		Low	Normal	High		
Vata	Low (28.0%)	4 (8%)	9 (18%)	1 (2%)	7.461	.113
	Moderate (64.0%)	1 (2%)	26 (52%)	5 (10%)		
	High (8.0%)	1 (2%)	2 (4%)	1 (2%)		
Pitta	Low (78.0%)	5 (10%)	30 (60%)	4 (8%)	1.055	.901
	Moderate (20.0%)	1 (2%)	7 (14%)	2 (4%)		
	High (2%)	0	1 (2%)	0		
Kapha	Low (34%)	0	8 (16%)	9 (18%)	8.190	0.017
	Moderate (62%)	0	26 (52%)	5 (10%)		
	High (4%)	0	2 (4%)	0		

Graph 3: Relation between Lymphocytes and *Doshaja Kasa*



DISCUSSION ON RESULTS

Significance of Neutrophils in *Vataja Kasa*

- The critical role of neutrophils in immunity associated diseases including respiratory diseases cannot be overlooked. Innate and adaptive immune component could participate in the activation of neutrophils in many different respiratory diseases. Neutrophils often cooperate with lymphocytes, they combine and constitute a huge immune regulatory network.
- Neutrophil sequestration is an essential defense mechanism in the lung which involves multiple steps, including.[5]
  - ✓ Activation of transcription factors.
  - ✓ Production of chemokines.
  - ✓ Up regulation of cell adhesion molecules.
  - ✓ Enhancement of cell to cell interactions. Elucidating the key molecules involved innate pulmonary defense.
  - ✓ Hence neutrophil accumulation is important to induce a successful adaptive immune response in the host.
  - ✓ Different stimulations from our sorroundings could produce a chemotactic activity towards the inflammatory sites for neutrophils.
  - ✓ Neutrophils are the primary respondents among immune cells which are responsible for further immune processes like alerting lung-resident lymphoid cells through the secretion of first order cytokines.[6]
  - ✓ Neutrophils and cytokines associated with neutrophil chemotaxis and activation may contribute to the pathogenesis of dry cough

might be the reason for significant neutrophil count in *Vataja Kasa*.[7]

Significance of Eosinophils in *Pittaja Kasa*

- ✓ Eosinophils are multifunctional leucocytes involved with in the pathogenesis of various inflammatory processes.[8]
- ✓ In response to several stimuli, like immune-globulins, cytokines, and complement system, eosiniphils are activated and recruited from circulation to the situatin of inflammation. Once at the situation of inflammation, eosinophils can modulate the immune response through the secretion of several pro-inflammatory mediators.[9]
- ✓ Modulation of cellular trafficking along with activation and regulation of vascular permeability and mucus secretion.[10]
- ✓ Eosinophilic cationic protein secreted by its cytotoxic granules is involved in the suppression of T-cell proliferative responses, and synthesis of immunoglobulin's by B cells, induces mast cell degranulation and stimulation of mucus secretion in the airways.[11]
- ✓ As *Paka* and *Shotha* are *Vishesha Lakshans* of *Pitta Vruddhi*, the effect of eisnophils in *Pittaja Kasa* may be correlated with the above mentioned functioning of eosinophils.

Significance of Lymphocytes in *Kaphaja Kasa*[12,13]

- ✓ Lymphocytes play an important role in innate immune response to viruses, bacteria, fungi, and they have rapid activation through cytokines and growth factors.
- ✓ There are said to be three types of lymphocytes, known as T cells, B cells, and NK (Natural Killer) cells.
- ✓ T lymphocytes are the immunomodulators and producers of cytokines. According to the pattern of synthesis of cytokines, helper T cells are classified in to Th1 cells secreting IL-2, IF- , and lymphotoxin, while Th2 cells secrete IL-4, IL-5, IL-6 and IL-10. The Th1 response is said to be associated with the antiviral immunity. T cells will be able to recognise viral antigens outside the infected cells
- ✓ B cells - they produce antibodies activating the immune system to destroy pathogens. They can reconise the surface antigens of both bacteria and virus.
- ✓ Natural killer cells are lymphocytes that are known as cytotoxic. This means that they possess the ability to kill other cells. These cells are an important part of the immune system because they are able to recognize virally infected cells, and kill them before they cause a great amount of harm.

As role lymphocyte is more prominent in immune response towards viruses, presence of viral pathogens might be the reason for increased count of lymphocytes in *Kaphaja Kasa.*

Discussion on other Clinically Significant Investigations

A.E.C was clinically significant in *Vataja Kasa* with 32% of the subjects of *Vataja Kasa* were recorded with higher ranges of A.E.C.

CONCLUSION

- ➢ *Vataja Kasa* can be diagnosed clinically by increase of Neutrophils and A.E.C.
- ➢ Raise in A.E.C elicits the inflammatory response of eosinophils in *Pittaja Kasa*.
- ➢ Role of lymphocytes count in *Kaphaja Kasa* cannot be established due to constrained sample size and need to study elobarate for further study.
- ➢ Other haematological parameters like Basophil, Monocyte, T.C has not shown any significance in diagnosis.

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