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Research Article

TO STUDY THE *NIDANPANCHAK* OF *DOSHAJ KASA*

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KEYWORDS: *Nidan Panchaka, Doshaj Kasa,* Total Leucocyte Count, Differential Leucocyte Count.

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ABSTRACT

Kasa roga is very common due to unfavorable environmental condition, Hence the disease '*Kasa*' was selected for present study. In this research we have studied the *Nidanpanchak* of *Vataj kasa, Pittaj kasa,* and *Kaphaj kasa* and changes in values of total leucocyte count and differential leucocyte count. Those patients who were complaining the symptoms like *Hrid pradeshi shool, Swarbheda, Shirshool, Shushk kasa* considered as *Vataj kasa. Urovidah, Trushna, Jwar, Chhardi* were considered as *Pittaj kasa* and in *Kaphaj kasa* symptoms were *Shiroruja, Kasa, Kaphashtivan* and *Kandu*.

Present study is to find the changes in total leucocyte count and differential leucocyte count in *Vataj kasa, Pittaj kasa* and *Kaphaj kasa.*

The patients were more in number with *Vataj kasa* as compared to *Pittaj* and *Kaphaj kasa*. Total leucocyte count was seen more in *Kaphaj kasa* than in *Pittaj* and *Vataj kasa*. Neutrophil for *Pittaj kasa* was observed to be significantly higher than that of *Kaphaj kasa* but there was no significant difference between neutrophil of *Pittaj* and *Vataj kasa* as well as *Kaphaj* and *Vataj kasa*. Eosinophil was significantly observed in *Kaphaj kasa* as compared to *Pittaj* and *Vataj kasa*. Also, there was significant increase in *Vataj kasa* than *Pittaj kasa*. Basophil was not observed in any of the patient included in study.

Monocyte was found significant in *Vataj kasa* as compare to *Kaphaj* and *Pittaj kasa*. Lymphocyte count was nearly equal for all three *Kasas*. i.e., there was no significant difference between lymphocyte count of three *Kasa – Vataj, Pittaj* and *Kaphaj.*

INTRODUCTION

Ayurveda is an ancient holistic medical system that originated in India more than five thousand years ago. It is considered as the *Upveda* of 'Atharv Veda'. The term Ayurveda is derived from the Sanskrit word 'AYU' which stands for the integrated relation of body, sense, mind and the soul, and Veda means science.

Thus, Ayurveda can be translated to 'Life science'. Usually treatment is not the first step for disease, so we have to find the *Nidana* by examine the patient with clinical examination and investigation.

Cell is the fundamental unit of biological activity. One of the unique features of living activity is breathing. The basic activity of *Pranvaha strotas* is exchange of gases. The rate at which it functions for the exchange of gas makes it one of the most vulnerable sites for disease. Respiration is the process by which oxygen from the lungs is carried by the blood to the tissues and co_2 formed in the tissues by the metabolic activity is carried by the blood to the lungs and is expired out. Upper respiratory track extends from the upper nares to the vocal cord and lower respiratory track extend from the vocal cord to the alveoli.

In today's stressful modern urbanized life style people are suffering from different kinds of health problems. Due to rapid industrialization, excessive crowding, increasing pollution, sudden climate change, unavoidable factors, infections, they are prone to develop respiratory disease is nothing but *Kasa Vyadhi*.

Kasa is a symptom in many diseases but Ayurveda separately explained that, it is a one type of disease. *Ahitkar aahar, Vihar* and *Manas hetu sevana* leads to the *Apan vayu prakopa*, the normal *gati* of *Apan vayu* is *Anuloma* but *Prakupit Apan vayu* becomes *Pratiloma* it gets *Urdhwa gati* due to this there is obstruction in *Prakrut anuloma gati* of *Pranvayu* and *Gati* of *Udan vayu* which is naturally *Pratiloma* is increased in *Pranvaha strotas* which causes *Sangarsha* of *Pran* and *Udan vayu* and this *Dosha Dushya samurchana* produces expulsion of *Sadosh pranvayu* producing different sound. The most common disease to the extent up to 60% of total disease record. A wide description about *Kasa vyadhi* is available in Bhruhatrayee and Laghutrayee also.

There is forceful expulsion of *Vayu* through *Kanth* produces *Vikrit* sound i.e. *Kasa*. It is *Pranvaha Strotodushti* in which mainly *Pran* and *Udana vayu vikriti* takes place. Cough is protective reflex by means of which respiratory passages are kept free from foreign matter. Charkacharya has explained five types of *Kasa Vyadhi. Vataj kasa, Pittaj kasa, Kaphaj kasa, Kshayaj kasa*, and *Kshataj kasa*. Out of them we have studied only *Doshaj kasa* i.e. *Vataj kasa, Pittaj kasa* and *Kaphaj kasa.*

Leucocytosis will indicate respiratory infection of bacterial origin. The leucocytes of the peripheral blood are of two main varieties distinguished by the presence or absence of granules, they are granulocytes and agranulocytes. The granulocytes according to appearance of nuclei are subdivided into Neutrophil, Eosinophil, Basophil and agranulocytes are lymphocyte and monocyte. So in this research study evaluation of changes in total leucocyte count and differential leucocyte count may be much easier and helpful for physician to diagnose *Doshaj* types and treat the *Kasa*.

AIMS AND OBJECTIVE

AIM- To study the *Nidanpanchak* of *Doshaj kasa.*

OBJECTIVE

1) To study of *Vataj kasa, Pittaj kasa, Kaphaj kasa* from Ayurvedic literature.

2) Study of total leucocyte count and differential leucocyte count.

3) To find the changes in total leucocyte count and differential leucocyte count in *Vataj kasa, Pittaj kasa* and *Kaphaj kasa*.

MATERIALS AND METHODS

1) Patients were selected randomly from OPD and camp organized by our institute.

2) Kit needed for total leucocyte count and differential leucocyte count-Leishman's stain, buffer, slide, microscope, spreader, neubaurs chamber, cover slip, EDTA bulb, and disposable syringe with needle, Cidar wood oil, WBC pipette, WBC diluting fluid.

Diagnostic Phase

Patients suffering from signs and symptoms of *Doshaj kasa* were diagnosed and selected for study.

Selection of the Patient

Inclusion Criteria

a) Patients of age group above 12 year.

b) Both sexes- male and female patients was selected.

c) Patient from any social, economical, marital state and profession was taken.

d) Patient who have sign and symptoms of *Kasa* mentioned in Ayurveda texts was included for study which are as follows-

Vataj kasa

Symptoms

1) *Hrid pradeshi shool* while *Kasa* (Pain in chest while coughing)

2) *Swarbheda* (harshness of voice)

3) *Shirshool* (headache)

4) *Shushk kasa* (dry cough)

Pittaj kasa

Symptoms

1) *Urovidah* (burning sensation in chest)

2) *Chhardi* (vomiting)

3) *Trushna* (thirst)

4) *Jwar* (Fever)

Kaphaj kasa

Symptoms

1) *Shiroruja* (headache)

2) *Kasa* (cough)

3) *Kaphashtivan* (cough with expectoration)

4) *Kandu* (itching sensation over body)

Exclusion Criteria

a) Age below 12 year

b) Patient having any complication like heart disease, diabetes mellitus, congestive cardiac failure, HIV, carcinoma, tuberculosis, Drug induced cough like ACE inhibitor.

c) *Kasa* as a complication in other systemic disease.

d) Patient of *Kshayaj* and *Kshataj kasa* was excluded.

1. Single group of 100 patients were carried out for study after appropriate consulting with written consent for participation in the research.
2. Separate consent form was designed for 2 groups-
   1) 12 to 18 year
   2) Above 18 year
3. Special case paper Performa were made up.
4. Blood sample was taken in EDTA bulb.
5. Method used for total leucocyte count and differential leucocyte counts are-
   TLC- Neubaurs chamber
   DLC-peripheral blood smears

Interventional phase

Specimens- Blood sample was taken in EDTA Bulb.

Procedure

Requirements

1) Microscope

2) Neubaurs chamber

3) WBC Pipette

4) WBC diluting fluid: It was prepared as follows

a) Glacial acetic acid: 2 ml

b) 1 % (w/v) gentian violet: 1ml

c) Distilled water: 97ml

This solution is stable at room temperature.

Procedure: Total leucocyte count

1) Blood was drawn up to 0.5 mark of a WBC pipette.

2) Carefully, wipe excess blood outside the pipette by using cotton. Diluting fluid was drawn up to 11 marks.

3) Mix the content in the pipette and after five minutes by discarding few drops, fill the counting chamber and allow the cells to settle for two to three minutes.

4) Focus on one of the "W" marked areas (each having 16 small squares) by turning objective to low power (10X).

5) Count cells in all four "W" marked corner squares.

Calculations

Number of white cells/cu mm (µ) of whole blood=

$$\frac{\text{Number of white cells counted} \times \text{Dilution}}{\text{Area counted} \times \text{Depth of fluid}}$$

Where: Dilution=20

Area counted=4× 1 square mm = 4 square mm

Depth of fluid =0.1 mm (constant)

Hence no. of white cells per cu mm (µl) of whole blood=

$$\frac{\text{No of cells counted x 20}}{4 \times 0.1}$$

= No of cells counted x 50

Differential Leucocyte Count

SPECIMEN: The blood smears should be preferably prepared immediately after venipuncture before mixing with anticoagulant. If EDTA blood is used the smears should be prepared within 1 to 2 hours after blood drawing.

Requirements-

1) Microscope slides and a glass spreader

2) Cedar wood oil (immersion oil)

3) Reagents

A) Leishman stain

B) Buffer: It was prepared as follows:

1) Sodium dihydrogen phosphate: 3.76 g

2) Potassium dihydrogen phosphate: 2.10 g

3) Distilled water to 1000 ml Keep at room temperature.

Procedure: A thin smear is prepared by spreading a small drop of blood evenly on a slide.

Making the film

1) Take a clean, dry slide.

2) Transfer a small drop of blood near the edge of the slide.

3) Place the spreader slide at an angle of 30°. Pull back the spreader until it touches the drop of blood. Let the blood run along the edge of the spreader.

4) Push the spreader forward to the end of the slide with a smooth movement.

5) Dry the blood smear at room temperature. Adequate drying is essential to preserve the quality of the film.

Staining the film

1) Cover the smear with the staining solution by adding 10-15 drops on the smear. Wait exactly for one minute.

2) Add equal number of the drops of buffer solution. Mix the reaction mixture adequately by blowing on it through a pipette. Wait for 10 minutes.

3) Wash the smear by using tap water.

4) Stand the slide in a draining rack.

Examination of film

1) First examine the stained smear under the low power. In an ideal smear three zones will appear 1) Thick smear2) Body 3) Thin end of the smear.

2) Choose the portion slightly before the tail end where the red cells are beginning to overlap.

3) Place a drop of immersion oil on the smear. Switch to the oil immersion objective and increase the light by opening the iris diaphragm.

4) Examine the film by moving from one field to the next systematically. Record the type of leucocyte seen in each field.

5) Count at least a total of 100 leucocytes.

Assessment Phase

Criteria for Assessment

For the assessment following parameters were considered and they were graded and scores were given as follows

0 – Absent
1 –Mild
2 – Moderate
3 – Severe

1) *Vataj kasa*

a) *Hrid pradeshi shool* while *Kasa*

0 –Absent
1 –Mild pain during coughing only
2 – Unable to cough because of pain but no tenderness over chest
3 –Unbearable continuous pain during coughing even in resting stage and tenderness over chest.

b) *Swarbheda*

0 –Absent
1 - Mild harshness of voice
2 - Unclear words are produced
3 - Words are not produced only air comes

c) *Shirshool*

0 - Absent
1 - Pain lasting for short duration
2 - Continuous pain but able to work
3 - Unbearable pain unable to work

d) *Shushka kasa*

0 - Absent
1 - Duration of *Kasa* less than 5 seconds
2 - Duration of *Kasa* between 6-15 seconds
3 -Duration of *Kasa* above 15 seconds

2) *Pittaj kasa*

a) *Urovidah*-
0 -Absent
1 - Epigastric burning sensation lasting for short duration and subside itself
2 -Continuous epigastric burning sensation but no epigastric tenderness
3 -Continuous epigastric burning sensation with epigastric pain

b) *Charddi*

0 - Absent
1 - Once in 2 days
2 - 2-3 time/days
3 - Above 3 times /day

c) *Trushna*

0 - Absent
1 - *Trushna* subsides after drinking of water
2 - Patient needs continue drinking of water
3 - Not subside after drinking plenty of water

d) *Jwara*

0 - No fever
1 – Between 98-99 degree F
2 - Between 100-101 degree F
3 - Above 101 degree F

3) *Kaphaj kasa*

a) *Shiroruja*

0 - Absent
1 - Pain lasting for short duration and subside itself
2 - Continuous pain but able to work
3 - Unbearable pain unable to work

b) *Kasa*

0 - Absent
1 - Episodes of cough with expectoration 10 times /day
2 - Episodes of cough with expectoration 11-15 times /day
3 - Episodes of cough with expectoration above 15 times

c) *Kandu*

0 - Absent
1 - Occasional itching
2 - Continuous itching without disturbing daily work
3 - Continuous itching which interferes daily work

d) *Kaphashthivan*

0 - Absent
1 - Whitish and watery colour of sputum
2 - Yellow white colour of sputum
3 - Greenish and purulent colour

Objective Criteria

a) Wheeze

0 – Absent
1 - Mild polyphonic wheezing limited to zones
2 – Marked polyphonic wheezing limited to zones
3 - Marked polyphonic wheezing all over lung field

b) Crepitation

0 - Absent
1 - Present in one zone
2 - Present in 2 zone
3 - Scattered all over lung field

c) Fever

0 - Absent
1 – Between 98-99 degree F
2 - Between100-101 degree F

3 – Above 101 degree F

d) Respiratory rate

0 – 18-20/minute
1 – 21-25/minute
3 – 26-30/minute
4 – Above 30/minute

e) Pulse rate

0 - 70-72/minute
1 - 73-80/minute
2 - 81-90/minute
3 - Above 90/minute

Total Leucocyte Count

1) Leucocytes

0 - 4000-11000/cu mm
1 - 11001-13000/cu mm
2 – 13001- 16000/cu mm
3 - Above 16000/cu mm

Below 4000/cu mm- Leucopenia
Below 3000/cu mm- Absolute leucopenia

Differential Leucocyte Count

1) Neutrophil

0 - 60-75%
1 - 76-80%
2 - 81-85%
3 - Above 85%

2) Eosinophil

0 - 1-6%
1 - 7-9%
2 - 10-12%
3 - Above 12%

3) Basophil- Absent

4) Monocyte

0 - 1-10 %
1 - 11-13%
2 - 14-16%
3 - Above 16%

5) Lymphocyte

0 - 20-45%
1 - 46-54%
2 - 55-64%
3 - Above 65%

OBSERVATIONS AND RESULTS

1. A)Incidence of Age

Age (in Years)	Mean	S.D.	S.E.	n
Kapha kasa	38.67	18.82	3.28	33
Pitta Kasa	37.27	10.98	2.00	30
Vata Kasa	33.78	13.19	2.17	37

For *Kaphaj kasa* subgroup, mean age of patients were 38.67 years with S.D. of 18.82 years. Patients with *Pittaj kasa* were with mean age of 37.27 years and S.D. of 10.98 years while *Vataj kasa* patients were distributed with mean age 33.78 years and S.D. of 13.19 years.

B) Group wise Incidence of Age

Sr. No.	Age (in yrs)	*Kaphaj kasa*		*Pittaj kasa*		*Vataj kasa*		Total	
		Count	%	Count	%	Count	%	Count	%
1.	12 – 20	06	16.22%	02	06.67%	04	12.12%	12	12.00%
2.	20 – 30	08	21.62%	06	20.00%	10	30.30%	24	24.00%
3.	30 – 40	10	27.03%	10	33.33%	06	18.18%	26	26.00%
4.	40 – 50	09	24.32%	09	30.00%	03	09.09%	21	21.00%
5.	50 – 60	03	08.11%	02	06.67%	02	06.06%	07	07.00%
6.	60 – 70	00	00.00%	01	03.33%	06	18.18%	07	07.00%
7.	70 – 80	01	02.70%	00	00.00%	02	06.06%	03	03.00%
Total		33	100.00%	30	100.00%	37	100.00%	100	100.00%

Out of 37 patients of *Vata kasa,* 6 patients (16%) were from age group 10 – 20 years, 8 patients (22%) were having age between 20 – 30 years, 10 patients (27%) were with age group 30 – 40 years, 9 patients (24%) were with age group 40 – 50 years, 3 patients (8%) were having age between 50 – 60 years while 1 patient (3%) was with age between 70 – 80 years. Out of 30 patients of *Pitta kasa,* 2 patients (7%) were from age group 10 – 20 years, 6 patients (20%) were having age between 20 – 30 years, 10 patients (33%) were with age group 30 – 40 years, 9 patients (30%) were with age group 40 – 50 years, 2 patients (7%) were having age between 50 – 60 years while 1 patient (3%) was with age between 60 – 70 years. Out

of 33 patients of *Kapha kasa,* 4 patients (12%) were from age group 10 – 20 years, 10 patients (30%) were having age between 20 – 30 years, 6 patients (18%) were with age group 30 – 40 years, 3 patients (9%) were with age group 40 – 50 years, 2 patients (6%) were having age between 50 – 60 years, 6 patient (18%) was with age between 60 – 70 years while 2 patients (6) were having age between 70 – 80 years.

2. Incidence of Sex

Sr. No.	Sex	*Kaphaj kasa*		*Pittaj kasa*		*Vataj kasa*		Total	
		Count	%	Count	%	Count	%	Count	%
1.	Male	17	51.52%	12	40.00%	15	40.54%	44	44.00%
2.	Female	16	48.48%	18	60.00%	22	59.46%	56	56.00%
Total		33	100.00%	30	100.00%	37	100.00%	100	100.00%

Out of 33 patients of *Kaphaj kasa*, 17 patients (52%) were male while 16 patients (48%) were Female. Out of 30 patients of *Pitta kasa*, 12 patients (40%) were male while 18 patients (60%) were female while in *Vataj kasa* subgroup, 15 patients (41%) out of 37 patients were male while remaining 22 patients (59%) were female.

3. Incidence of Socio-economic status

Sr. No.	Socio-economic status	*Kaphaj kasa*		*Pittaj kasa*		*Vataj kasa*		Total	
		Count	%	Count	%	Count	%	Count	%
1.	Lower class	03	09.09%	05	16.67%	06	16.21%	14	14.00%
2.	Middle class	27	81.81%	22	73.33%	30	81.08%	79	79.00%
3.	Upper class	03	09.09%	03	10.00%	01	02.70%	07	07.00%

Out of 33 patients of *Kaphaj kasa*, 3 patients (9%) were from lower class, 27 patients (82%) were from middle class while 3 patients (9%) were from upper class. Out of 30 patients of *Pittaj kasa*, 5 patients (17%) from lower class, 22 patients (73%) were from middle class while remaining 3 patietns (10%) were from upper class. Out of 37 patients of vataj – kasa, 6 patients (16%) were from lower class, 30 patients (81%) were from middle class while 1 patient (3%) was from upper class.

4. Incidence of Occupation

Sr. No.	Sex	*Kaphaj kasa*		*Pittaj kasa*		*Vataj kasa*		Total	
		Count	%	Count	%	Count	%	Count	%
1.	Farmer	03	09.09%	08	26.66%	05	13.51%	16	16.00%
2.	Housewife	07	21.21%	07	23.33%	04	10.81%	18	18.00%
3.	Service	10	30.30%	09	30.00%	14	37.84%	33	33.00%
4.	Student	06	18.18%	02	06.67%	09	24.32%	17	17.00%
5.	Worker	07	21.21%	04	13.33%	05	13.51%	16	16.00%
Total		33	100.00%	30	100.00%	37	100.00%	100	100.00%

Out of 33 patients of *Kaphaj kasa*, 3 patients (9%) were farmer, 7 patients (21%) were housewives, 10 patients (30%) were in service, and 6 patients (18%) were student while 7 patients (21%) were worker. In 30 patients of *Pittaj kasa*, 8 patients (27%) were farmer, 7 patients (23%) were housewives, 9 patients (30%) were in service, 2 patients (7%) were student and 4 patients (13%) were worker. While in *Vataj kasa* subgroup out of 37 patients, 5 patients (13%) were farmer, 4 patietns (11%) were housewives, 14 patients (38%) were in service, 9 patients (24%) were student and 5 patients (14%) were worker.

Incidence of *Prakruti*

Sr. No.	Prakruti	*Kaphaj kasa*		*Pittaj kasa*		*Vataj kasa*		Total	
		Count	%	Count	%	Count	%	Count	%
1.	*Vata- Pitta*	04	12.12%	02	06.67%	07	18.92%	13	13.00%
2.	*Vata-Kaphaja*	02	06.06%	00	00.00%	06	16.22%	08	08.00%
3.	*Pitta-Kaphaja*	06	18.18%	19	63.33%	08	21.62%	23	23.00%

4.	*Pitta-Vataj*	01	03.03%	06	20.00%	06	16.22%	13	13.00%
5.	*Kapha-Vataj*	06	18.18%	01	03.33%	04	10.81%	11	11.00%
	Kapha-Pittaj	14	42.42%	02	06.67%	06	16.22	22	22.00%
Total		33	100.00%	30	100.00%	37	100.00%	100	100.00%

Out of 33 patients of *Kapha kasa*, 4 patients (12%) were of *Vata – pittaj prakruti*, 2 patients (7%) were of *Vata – kaphaj prakruti*, 6 patients (18%) were of *Pitta – kaphaj prakruti*, 1 patient (3%) was of *Pitta vataj prakruti*, 6 patients (18%) were of *Kapha vataj prakruti* while 14 patients (42%) were of *Kapha – pittaj prakruti*. In 30 patients of *Pitta kasa*, 2 patients (7%) were of *Vata – pittaj prakruti*, 19 patients (63%) were of *Pitta – kaphaj prakruti*, 6 patients (20%) were of *Pitta vataj prakruti*, 1 patient (3%) was of *Kapha vataj parakruti* while 2 patients (7%) were of *Kapha – pittaj prakruti*. While in *Vata kasa* subgroup out of 37 patients, 7 patients (19%) were of *Vata – pittaj prakruti*, 6 patients (16%) were of *Vata – kaphaj prakruti*, 8 patients (22%) were of *Pitta – kaphaj prakruti*, 6 patients (16%) were of *Pitta vataj prakruti*, 4 patients (11%) were of *Kapha vataj parakruti* while 6 patients (16%) were of *Kapha – pittaj prakruti*.

5. Incidence of *Lakshanas*

Kasa Subgroup	**No**	***Lakshana***	**No. of patients**	**%**	**Degree of *Lakshana***		
					Median score	**Mean score**	**S.D. of score**
Kaphaj kasa	33	*Shiroruja*	23	70%	1	0.697	0.467
		Kasa	33	100%	1	1.303	0.529
		Kandu	19	58%	1	0.727	0.719
		Kaphashtivan	33	100%	1	1.545	0.711
Pittaj kasa	30	*Urovidhah*	17	57%	1	0.700	0.702
		Chardi	20	67%	1	0.667	0.479
		Trushna	30	100%	2	1.800	0.761
		Jwara	30	100%	1	1.133	0.346
Vataj kasa	37	*Hrid pradeshi shool while kasa*	18	49%	0	0.595	0.725
		Swarbheda	32	87%	1	1.135	0.631
		Shirshool	34	92%	1	1.135	0.536
		Shushka kasa	37	100%	1	1.595	0.798

***Kaphaj – Kasa* subgroup**

a. ***Shiroruja*** – *Shiroruja* was observed in *Kaphaj – Kasa* subgroup with median score 1 and Mean score 0.697 with S.D. of 0.467.
b. ***Kasa*** – *Kasa* was observed in *Kaphaj – Kasa* subgroup with median score 1 and Mean score 1.303 with S.D. of 0.529.
c. ***Kandu*** – *Kandu* was observed in *Kaphaj – Kasa* subgroup with median score 1 and Mean score 0.727 with S.D. of 0.719.
d. ***Kaphashtivan*** – *Kaphashtivan* was observed in *Kaphaj – Kasa* subgroup with median score 1 and Mean score 1.545 with S.D. of 0.711.

***Pittaj – Kasa* subgroup**

a. ***Urovidhah*** – *Urovidah* was observed in *Pitta – Kasa* subgroup with median score 1 and Mean score 0.700 with S.D. of 0.702.
b. ***Chardi*** – *Chardi* was observed in *Pitta – Chardi* subgroup with median score 1 and Mean score 0.667 with S.D. of 0.479.
c. ***Trushna*** – *Trushna* was observed in *Pitta – Kasa* subgroup with median score 2 and Mean score 1.800 with S.D. of 0.761.
d. ***Jwara*** – *Jwara* was observed in *Pitta – Kasa* subgroup with median score 1 and Mean score 1.133 with S.D. of 0.346.

***Vataj – Kasa* subgroup:-**

a. *Hrid pradeshi shool* while *Kasa – Hrid pradeshi shool* with *Kasa* was observed in *Vata – Kasa* subgroup with median score 0 and Mean score 0.595 with S.D. of 0.725.

b. *Swarbheda – Swarbheda* was observed in *Vata – Swarbheda* subgroup with median score 1 and Mean score 1.135 with S.D. of 0.641.
c. *Shirshool – Shirshool* was observed in *Vata – Kasa* subgroup with median score 1 and Mean score 1.135 with S.D. of 0.536.
d. *Shushka kasa – Shushka kasa* was observed in *Vata – Kasa* subgroup with median score 1 and Mean score 1.595 with S.D. of 0.798.

Statistical analysis of different parameters:- As grading used for some of the parameters were ordinal in nature, "Kruskal-Wallis test" with "Dunn test" (Bonferroni corrected) as post-hoc test is used. For quantitative parameters (Laboratory investigations), we have used Analysis of Variance (ANOVA) with "Pairwise t test" (Bonferroni corrected) as post-hoc test. Post-hoc tests are performed only when there is significant difference observed in omnibus tests (i.e. either Kruskal-Wallis or one way ANOVA). We have tested hypothesis for each parameter and result is interpreted accordingly. The level of significance is kept at 0.05. Finding are presented with proper summary statistics - mean, median and S.D. In graphical representation, spread of data is represented by S.D. as error bars while variability for mean is represented by S.E. as error bars.

Wheeze

Subgroup	Median score	Mean score	S.D. Of score	d.f.	Kruskal- Wallis Statistic	P- Value
Kaphaj kasa	1	1.12	0.545	2	63.858	<0.001
Pittaj kasa	1	0.80	0.484			
Vataj kasa	0	0.00	0.000			

Distribution of Wheeze for *Kaphaj kasa*, *Pittaj kasa* and *Vataj kasa* subgroups were significantly different (Kruskal-Wallis statistic = 68.858, P-value < 0.001) at 5% level of significance. Post-hoc analysis using Dunn test with Bonferroni correction revealed that, Wheeze for *Kapha kasa* subgroup was significantly higher than that of *Vataj kasa* (P-value < 0.001). Also, Wheeze for *Pittaj kasa* subgroup was significantly higher than that of *Vataj kasa* (P-value < 0.001). While there was no significant difference observed between wheeze of subgroups – *Pitta Kasa* and *Kapha kasa* (P-value = 0.128) at 5% level of significance.

Subgroups	***Kaphaj kasa***	***Pittaj kasa***
Pittaj kasa	0.128	-
Vataj kasa	< 0.001	< 0.001

Crepitation

Subgroup	Median score	Mean score	S.D. Of score	d.f.	Kruskal- Wallis statistic	P- Value
Kaphaj kasa	1	1.27	0.574	2	62.446	<0.001
Pittaj kasa	0	0.47	0.571			
Vataj kasa	0	0.00	0.000			

Distribution of Crepitation for *Kaphaj kasa*, *Pittaj kasa* and *Vataj kasa* subgroups were significantly different (Kruskal-Wallis statistic = 62.446, P-value < 0.001) at 5% level of significance. Post-hoc analysis using Dunn test with Bonferroni correction revealed that, Crepitation for *Kaphaj kasa* subgroup was significantly higher than that of *Pittaj kasa* and *Vataj kasa* (both P-values < 0.001). Also, Crepitation for *Pittaj kasa* subgroup was significantly higher than that of *Vataj kasa* (P-value = 0.003) at 5% level of significance.

Subgroups	***Kaphaj kasa***	***Pittaj kasa***
Pittaj kasa	< 0.001	-
Vataj kasa	< 0.001	0.003

Fever

Subgroup	Median score	Mean score	S.D. Of score	d.f.	Kruskal- Wallis statistic	P- Value
Kaphaj kasa	0	0.00	0.000	2	95.917	<0.001
Pittaj kasa	1.5	1.50	0.509			
Vataj kasa	0	0.00	0.000			

Distribution of Fever for *Kaphaj kasa*, *Pittaj kasa* and *Vataj kasa* subgroups were significantly different (Kruskal-Wallis statistic = 95.917, P-value < 0.001) at 5% level of significance. Post-hoc analysis using Dunn test with Bonferroni correction revealed that, Fever for *Pittaj kasa* subgroup was significantly higher than that of *Kaphaj kasa* and *Vataj kasa* subgroups (both P-value < 0.001) at 5% level of significance. while there was no incidence of fever in *Kaphaj* and *Vataj kasa*.

Subgroups	***Kaphaj kasa***	***Pittaj kasa***
Pittaj kasa	< 0.001	-
Vataj kasa	-	< 0.001

Respiratory rate

Subgroup	**Median score**	**Mean score**	**S.D. Of score**	**d.f.**	**Kruskal- Wallis statistic**	**P- Value**
Kaphaj kasa	1	0.97	0.467	2	58.073	<0.001
Pittaj kasa	1	0.80	0.484			
Vataj kasa	0	0.03	0.164			

Distribution of Respiratory rate for *Kaphaj kasa*, *Pittaj kasa* and *Vataj kasa* subgroups were significantly different (Kruskal-Wallis statistic = 58.073, P-value < 0.001) at 5% level of significance. Post-hoc analysis using Dunn test with Bonferroni correction revealed that, Respiratory rate for *Kaphaj kasa* subgroup was significantly higher than that of *Vataj kasa* subgroup (P-value < 0.001). Also, Respiratory rate for *Pittaj kasa* subgroup was significantly higher than that of *Vataj kasa* subgroup (P-value < 0.001) while mean respiratory rate for *Kaphaj kasa* and *Pittaj kasa* were not significantly different (P-value = 0.427) at 5% level of significance.

Subgroups	***Kaphaj kasa***	***Pittaj kasa***
Pittaj kasa	0.427	-
Vataj kasa	< 0.001	< 0.001

Pulse rate

Subgroup	**Median score**	**Mean score**	**S.D. Of score**	**d.f.**	**Kruskal- Wallis statistic**	**P- Value**
Kaphaj kasa	1	0.64	0.653	2	57.102	<0.001
Pittaj kasa	1	1.23	0.504			
Vataj kasa	0	0.03	0.164			

Distribution of Pulse rate for *Kaphaj kasa*, *Pittaj kasa* and *Vataj kasa* subgroups were significantly different (Kruskal-Wallis statistic = 57.102, P-value < 0.001) at 5% level of significance. Post-hoc analysis using Dunn test with Bonferroni correction revealed that, Pulse rate for *Pittaj kasa* subgroup was significantly higher than that of *Kaphaj kasa* and *Vataj kasa* subgroup (P-value = 0.001 & < 0.001 respectively). Also, Pulse rate for *Kaphaj kasa* subgroup was significantly higher than that of *Vataj kasa* subgroup (P-value < 0.001) at 5% level of significance.

Subgroups	***Kaphaj kasa***	***Pittaj kasa***
Pittaj kasa	0.001	-
Vataj kasa	< 0.001	< 0.001

Total Leucocyte Count (TLC)

Source	**d.f.**	**Sum of squares**	**Mean sum of square**	**F statistic**	**P-value**
Kasa (subgroups)	2	804321381	402160690	275	<0.001
Residuals	97	141860219	1462476		

TLC for *Kaphaj kasa* subgroup (Mean = 12836.36, S.D. = 1461.13), *Pittaj kasa* subgroup (Mean = 9646.67, S.D. =1008.49) and *Vataj kasa* subgroup (mean = 6059.46, S.D. = 1106.16) were significantly different (F = 275, P-value < 0.001) at 5% level of significance. Post-Hoc analysis using "Pairwise t test" revealed that, Mean TLC for *Kaphaj kasa* subgroup was significantly higher than mean TLC for *Pittaj kasa* and *Vataj kasa* subgroups (both P-values < 0.001). Also, mean TLC for *Pittaj kasa* subgroup was significantly higher (P-value < 0.001) than that of *Vataj kasa* subgroup.

Subgroups	*Kaphaj kasa*	*Pittaj kasa*
Pittaj kasa	< 0.001	-
Vataj kasa	< 0.001	< 0.001

Differential Leucocyte Count (DLC)

Neutrophil

Source	d.f.	Sum of squares	Mean sum of square	F statistic	P-value
Kasa (subgroups)	2	1108	553.8	8.282	< 0.001
Residuals	97	6486	66.9		

Neutrophil for *Kaphaj kasa* subgroup (Mean =62.91, S.D. = 11.71), *Pittaj kasa* subgroup (Mean = 71.27, S.D. =5.67) and *Vataj kasa* subgroup (mean = 67.54, S.D. = 5.68) were significantly different (F = 8.282, P-value < 0.001) at 5% level of significance. Post-Hoc analysis using "Pairwise t test" revealed that, mean Neutrophil for *Pittaj kasa* subgroup was significantly higher than mean Neutrophil for *Kaphaj kasa* subgroup (P-value < 0.001). While there was no significant difference observed in mean Neutrophil for *Kaphaj kasa* subgroup and *Vataj – Kasa* subgroup (P-value = 0.060). Also, the difference between mean Neutrophils of *Pittaj kasa* and *Vataj kasa* subgroup was insignificant (0.200) at 5% level of significance.

Subgroups	*Kaphaj kasa*	*Pittaj kasa*
Pittaj kasa	< 0.001	-
Vataj kasa	0.060	0.200

Eosinophil

Source	d.f.	Sum of squares	Mean sum of square	F statistic	P-value
Kasa (subgroups)	2	358.00	179.00	64.68	< 0.001
Residuals	97	268.40	2.77		

Eosinophil for *Kaphaj kasa* subgroup (Mean = 6.12, S.D. = 1.14), *Pittaj kasa* subgroup (Mean = 1.40, S.D. =0.81) and *Vataj kasa* subgroup (mean = 3.30, S.D. = 2.40) were significantly different (F = 64.68, P-value < 0.001) at 5% level of significance. Post-Hoc analysis using "Pairwise t test" revealed that, Mean Eosinophil for *Kapha kasa* subgroup was significantly higher than mean Eosinophil for *Pittaj kasa* and *Vataj kasa* subgroups (both P-values < 0.001). Also, mean Eosinophil for *Vataj kasa* subgroup was significantly higher (P-value < 0.001) than that of *Pittaj kasa* subgroup.

Subgroups	*Kaphaj kasa*	*Pittaj kasa*
Pittaj kasa	< 0.001	-
Vataj kasa	< 0.001	< 0.001

Basophil

Basophil was not observed in any of the patients included in the study.

Monocyte

Source	d.f.	Sum of squares	Mean sum of square	F statistic	P-value
Kasa (subgroups)	2	64.20	32.10	27.62	< 0.001
Residuals	97	112.8	1.16		

Monocyte for *Kaphaj kasa* subgroup (Mean = 0.73, S.D. = 0.45), *Pittaj kasa* subgroup (Mean = 1.03, S.D. =0.56) and *Vataj kasa* subgroup (mean = 2.51, S.D. = 1.64) were significantly different (F = 27.62, P-value < 0.001) at 5% level of significance. Post-Hoc analysis using "Pairwise t test" revealed that, Mean Monocyte for *Vataj kasa* subgroup was significantly higher than mean Monocyte for *Kaphaj kasa* and *Pittaj kasa* subgroups (both P-values < 0.001). While there was no significant difference between mean Monocyte of *Kaphaj kasa* and *Pittaj kasa* subgroups (P-value = 0.790) at 5% level of significance.

Subgroups	*Kaphaj kasa*	*Pittaj kasa*
Pittaj kasa	0.790	-
Vataj kasa	< 0.001	< 0.001

Lymphocyte

Source	d.f.	Sum of squares	Mean sum of square	F statistic	P-value
***Kasa* (subgroups)**	2	311	155.63	2.575	0.081
Residuals	97	5862	60.43		

Lymphocyte for *Kaphaj kasa* subgroup (Mean = 30.15, S.D. = 11.48), *Pittaj kasa* subgroup (Mean = 26.30, S.D. = 5.53) and *Vataj kasa* subgroup (mean = 26.49, S.D. = 4.57) were not significantly different (F = 2.575, P-value = 0.081) at 5% level of significance.

DISCUSSION

Discussion constitutes a critical stage in the development of thesis. Data observed during the study are pooled together and statistically analysed. *Kasa* appears to be a very simple disease but if neglected may lead to various critical conditions like *Kshaya, Rajyakshma* etc. as such has been described as *Swatantra Vyadhi*. While explaining the *Doshaj kasa* there is important to see the changes in leucocyte count may be much easier and helpful for physician to diagnose *Doshaj* types and treat the *Kasa*.

Vataj kasa

Aaharaj Hetu- Due to *Ruksha*, sheet, *Kashay aahar sevana, Langhana, Anashana, Guru vishtambhi aahar sevana* causes *Vata vriddhi* and leads to *Vataj kasa*.

Viharaj Hetu- *Atimargakramana, Ativyavay, Vegavidharna, Ratri jagarana, dhur dhul sevana, Atishrama, Ativyayam, Abhighat* leads to *Vata prakopa* resulting into *Vataj kasa*.

Mansik Hetu- *Shok, Bhay, Chinta, Anidra* causes *Vata prakopa* leading to *Vataj kasa*. Due to this *Aaharaj*, Viharaj and *Mansik hetu* develops *Vata prakopa* leading to *Pratiloma gati* of *Apan vayu* i.e. *Urdhwa gati* resulting into obstruction in *Prakrut gati* of *Pran vayu. Udan vayu* and *Pran vayu gati sangharsha*. *Pran vayu* gets *Pratiloma* direction reaches to *Ura, Kantha, Kanthanadi* leads to expulsion of *Sadosh pranvayu* through mouth producing *Vataj kasa*. During this *Samprapti* we found *Poorva rupas* like *Shuk poorna* gala, *Kanthkandu, Bhojyanamavarodha.* In *Vataj kasa* symptoms were *Shushka kasa, Hrid shool, Shir shool, Swarbheda Shankh pradeshi shool, Udar shool, Ksheena bala, Kshamnan, Prasakta vega.*

Pittaj kasa

Aaharaj Hetu- *Katu, Aamla, Lawana rasa sevan* causes vitiation of *Pitta prakopa*. *Ushna, Vidahi aahar atisevan* leading to *Pitta prakopa*. Viharaj *Hetu- Agisevan, Aatapsevan* leads *Ushna guna vriddhi*. Hence *Pittavriddhi* occurs.

Mansik Hetu- *Krodha, Bhay, shok* causes *pittavriddhi*. Due to this *Aaharaj, Viharaj, Mansik hetu* more *Pitta* and *Kapha prakopa* occurs at *Kantha, Kanthnadi, Ura Pradesh*. Which leads to expulsion of *Sadosh pran vayu* through mouth producing different sounds leads to *Pittaj kasa*. Hense these *Prakupit dosha* gives *Shook poorna* gala, *Kanthakandu, Bhojyanamavarodha* like *Poorva rupas* in *Pittaj kasa*. When *samprapti* happens symptoms were *Urovidah, Jwara, Chardi, Mukh shushkata, Trishna, Tikta mukha, Pittayukta kaphashthivan, Uradhumayan, Pitavarn Raktyukta chardi, Kantha daha, Netra daha, Netra twak panduta, Aruchi, Bhrama,* and *Shirshool*.

Kaphaj kasa

Aaharaj Hetu- Due to Guru, *Abhishyandi, Madhur, Snigdha Aahar sevana* causes *Kapha vriddhi* leads to *Kaphaj kasa*.

Viharaj Hetu- *Diwaswap* is the cause of *Kapha prakopa*. Due to this *Aaharaj, Viharaj* and *Mansik hetu kaphaprakopa* occurs which causes *Strotorodh*. Hence *Apanvayu* gets *Pratiloma gati* resulting into Udanvayu and *Pranvayu gati sangharsha.* Then *Pranvayu* gets *Pratiloma gati*. At *Kanth, kanthnadi, ura* Pradesh *Kapha prakopa* occurs leads to expulsion of *Sadosh Pranvayu* through mouth producing sound causes *Kaphaj kasa*. *Poorva rupas* found were shook *Poorna gala*, *Kanthakandu, Bhojyanamavarodha.* Symptoms were *Shiroruja, Kaphashthivan, Kandu, Kasa, Angagourav, Agnimandya, Chardi, Madhur aasya, Pratishyay.*

Age: In this study, it was observed that mean age of patients were 38.67 years for *Kaphaj kasa*. patients with *Pittaj kasa* were with mean age of 37.27 years while *Vataj kasa* patients were mean age of 33.78 years.

Sex: Out of 33 patients of *Kaphaj kasa* 17 patients (51.52%) were male while 16 patients (48.48%) were female. In this sex ratio male involvement is more, as numbers of male patients were taking sheet *Aahar, Viruddh aahar, Diwaswap, Avyayam*. Out of 30 patients of *Pittaj kasa*, 12 patients (40%) were male while 18 patients (60%) were female. In this sex ratio female involvement is more, as numbers of female patients were taking *Akalbhojana, Anashan, Ajirana, Diwaswap, Ratrojagarana.* While in *Vataj kasa* 15 patients (40.54%) out of 37 patients were male while 22

patients (59.46%) were female. In this sex ratio female involvement is more, as numbers of female patients were having *Dhur dhum Sevana, Aptarpana, Atishram, Ruksha Bhojana, Ativyavay.*

Socio economic status: In *Kaphaj kasa* it was observed from study that more number of patients were from middle class i.e. 27 patients (81.81%) because of *Diwaswap*, irregular meal timing, *Dadhi sevana*. In *Pittaj kasa* maximum number of patients were from middle class i.e. 22 patients (73.33%) because of *Ushna, Tikshna aahar* (drinking, spicy food) *Ratro jagarana*. In *Vataj kasa*, majority of patients were from middle class i.e. 30 patients (81.08%) because of *Ruksha Aahar, Alpa Aahar, Shrama, Vyasan, Rajodhum Sevana*.

Occupation: In this study, Out of 33 patients of *Kaphaj kasa*, maximum number of patients i.e.10 patients (30.30%) were in service which works in AC, sitting work. In this maximum number of patients i.e.9 patients (30%) were in service and takes *Vidahi aahar* (wadapav, spicy food, fried foods) *Viruddh aahar* (fruit salad), *Ratri jagaranottar diwaswap*, *Atijagarana*. In this maximum number of patients i.e. 14 patients (37.84%) were in service, the reason being due to marketing, *Dhur dhum sevana.*

Prakruti: In *Kaphaj kasa* we found maximum number of patient i.e. 14 patients (42.42%) were of *Kapha pittaj prakruti* because of *Samana gunatmaka* aahar *vihar* like banana, milk and milk products, *Diwaswap*. In *Pittaj kasa* we found maximum number of patient i.e.19 patients (63.33%) were of *Pitta kaphaj prakruti* as they taking *Samana Gunatmaka aahar vihar* like *Vidahi aahar, Viruddh Aahar* like milkshake, eating curd at night, *Ratri jagarana*. Though it is *Vataj kasa* we found maximum number of patient i.e. 8 patients (21.62%) were of *Pitta kaphaj prakruti* because of *Prakruti visham samvay janya aahar vihar* like cold drinks, *Ruksha aahar*, *Sheet aahar vihar.*

Lakshana

Vataj kasa

1) *Hrid pradeshi shool* while *Kasa*-It was present in 18 patients (49%)

2) *Swarbheda*-It was present in 32 patients (87%)

3) *Shirshool*-It was present in 34 patients (92%)

4) *Shushka kasa*- It was present in 37 patients (100%)

Pittaj kasa

1) *Urovidah*- It was present in 17 patients (57%)

2) *Chhardi* – It was present in 20 patients (67%)

3) *Trushna*-It was present in 30 patients (100%)

4) *Jwara*-It was present in 30 patients (100%)

Kaphaj kasa

1) *Shiroruja*- It was present in 23 patients (70%)

2) *Kasa*- It was present in 33 patients (100%)

3) *Kandu*- It was present in 19 patients (58%)

4) *Kaphashtivan*- It was present in 33 patients (100%)

Lakshana of *Vataj kasa, Pittaj kasa* and *Kaphaj kasa* explained above.

Wheeze: Wheeze was present in 30 patients (91%) of *Kaphaj kasa*, 23 patients (77%) of *Pittaj kasa* and absent in *Vataj kasa*(0%). Maximum number of patients of wheeze found in *Kaphaj* and *Pittaj kasa* than *Vataj kasa*, it may be due to *Shoth* inside the lumen of *Pranavaha strotas*. This shoth creats narrowing of lumen of bronchioles when inhaled air passes through this narrow bronchioles and it creats the sound of wheeze. The mean score for wheeze for *Kaphaj kasa* was significantly higher than that of *Vataj kasa* (P-value < 0.001). Mean score for wheeze of *Pittaj kasa* was also significantly higher than that of *Vataj kasa* (P-value < 0.001) while there was no significant difference in mean wheeze score for *Kaphaj kasa* and *Pittaj kasa* (P-value = 0.128).

Crepitation: Crepitation was present in 31 patients (94%) of *Kaphaj kasa*, 13 patients (44%) of *Pittaj kasa* and absent in *Vataj kasa* patients (0%). Maximum number of patients of crepitation was found in *Kaphaj kasa* than Pittaj and *Vataj kasa*, it may be due to *Sama kapha* deposited inside the *Pranvaha strotas*. Also, crepitation for *Pittaj kasa* was found more than *Vataj kasa*, it may due to Snigdha and *Drava gunatmaka kapha* deposited in *Pranvaha strotas*. The mean crepitation for *Kaphaj kasa* subgroup was significantly higher (P-value < 0.001) than that of *Pittaj kasa* and *Vataj kasa* subgroup. Also, the mean crepitation of *Pittaj kasa* was found to be significantly higher than that of *Vataj kasa* (P-value < 0.001).

Fever: In this study, Fever was present in 30 patients (100%) of *Pittaj kasa* it may be due to *Pitta* entering into rasa *Dhatu* which spreads all over body causing fever. While fever was absent in *Vataj* and *Kaphaj kasa* subgroup. The mean score for fever in *Pittaj kasa* subgroup was significantly higher (P-value< 0.001) than that of *Kaphaj kasa* and *Vataj kasa*.

Respiratory rate: In this study, Respiratory rate was present in 29 patients (88%) of *Kaphaj kasa*, 23 patients (77%) of *Pittaj kasa* and 1 patient (3%) of *Vataj kasa*. Maximum number of patients of respiratory rate was found in *Kaphaj kasa* than *Vataj kasa*, Because of Avarodha created by *Kapha* inside the *Pranavaha strotas* creating *Vimarg*

gamana of *Pran* and *Udan vayu* so respiratory rate increases. Also, maximum number of patients of respiratory rate was found in *Pittaj kasa* than *Vataj kasa* it may be due to *Ushna, Tikshna guna* of *Pitta* entering inside *Rasa dhatu* and it circulated in *Rasavaha strotas*, the *Mulsthana* of Rasa is *Hriday* which creates increasing heart rate and so the respiratory rate also increases. The mean respiratory rate score for *Kaphaja kasa* was significantly higher than that of *Vataj kasa* (P-value < 0.001). Also, mean respiratory rate score for *Pittaj kasa* was significantly higher than that of the *Vataj kasa* (P-value < 0.001). While there was significant difference in respiratory rate score of *Kaphaj* and *Pittaj kasa* (P-value = 0.427).

Pulse rate: Pulse rate was present in 29 patients (97%) of *Pittaj kasa*, 18 patients (55%) of *Kaphaj kasa* and 1 patient (3%) of *Vataj kasa*. Maximum number of patients of pulse rate was found in *Pittaj kasa* than *Kaphaj kasa* and *Vataj kasa*, it may due to *Ushna Tikshna guna* of *Pitta* entering into Rasa *dhatu* and hence *Rasavaha strotas* creating impact on *Mulsthana* i.e. *Hriday* which increases heart rate. Due to increase in heart rate there is increase in pulse rate. Also, maximum number of patient of pulse rate was found in *Kaphaj kasa* than *Vataj kasa*, it may be due to *Sama kapha* creating *Agni dushti*. *Samaan vayu* is *Agnisamipastha* which gets *Dushit*. This *Samaan vayu* gets vimargamana and creates *Dushti* in *Vyan vayu. Vyan vayu sthan* is *Hriday* which creates increasing in heart rate, this heart increases pulse rate.

The mean score of pulse rate for *Pittaj kasa* was significantly higher than that of *Kaphaj kasa* and *Vataj kasa* (P-values = 0.001 & < 0.001 respectively). Also, mean score of pulse rate for *Kaphaj kasa* was significantly higher than that of the *Vataj kasa* subgroup (P-value < 0.001).

Total leucocyte count: Mean Total Leucocyte Count for *Kaphaj kasa* was significantly higher than that of *Pittaj kasa* and *Vataj kasa* (both P-values < 0.001)**.** Also, mean Total Leucocyte Count for *Pittaj kasa* was significantly higher than that of *Vataj kasa* (P-value < 0.001).In this study Total leucocyte count is seen increased in case of *Kaphaj kasa* due to severe bacterial infection. Also total leucocyte count for *Pittaj kasa* than *Vataj kasa* is seen normally higher level due to bacterial infection causing fever.

Neutrophil: In this study it was observed that, mean neutrophil for *Pittaj kasa* was significantly higher than *Kaphaj kasa* (P-value < 0.001). While there was no significant difference observed in mean Neutrophil of *Kaphaj kasa* and *Vataj kasa* subgroup (P-value = 0.060). Also, the difference between mean neutrophil of *Pittaj kasa* and *Vataj kasa* was insignificant (P-value = 0.200).

Maximum number of Neutrophil was found in *Pittaj kasa* than *Vataj kasa* and *Kaphaj kasa*, Because of *Lakshana* of *Pittaj kasa* are similar to acute bacterial infection. As fever is seen in *Pittaj kasa*. Neutrophil acts as first line of defense in acute bacterial infection hence neutophilia is seen in *Pittaj kasa* which is significantly higher.

Eosinophil: Mean eosinophil for *Kaphaj kasa* was significantly higher than *Pittaj kasa* and *Vataj kasa* (Both P-values < 0.001). While mean eosinophil for *Vataj kasa* subgroup was significantly higher than that of the *Pittaj kasa* subgroup (P-value < 0.001). Maximum number of patients of eosinophil was found in *Kaphaj kasa* than *Pittaj kasa* and *Vataj kasa* because in *Lakshana* of *Kaphaj kasa* is kandu hence eosinophilia was seen. Also, maximum number of patients of eosinophil was found in *Vataj kasa* than *Pittaj kasa* because of eosinophills can consume foreign substances, particularly substance related to infection.

Basophil: Basophil was not observed in any of patient included in the study.

Monocyte: Mean monocyte for *Vataj kasa* was significantly higher than *Pittaj kasa* and *Kaphaj kasa* (both P-values<0.001). While there was no significant difference between mean monocyte of *Pittaj kasa* and *Kaphaj kasa* subgroup (P-value = 0.790). Maximum number of patient of monocyte was found in *Vataj kasa* than *Pittaj kasa* and *Kaphaj kasa* because *Kasa lakshana* is seen chronically in *Vataj kasa* patients. Monocytes are antigen specific immune cells and need many days to develop defence action.

Lymphocyte: Mean lymphocyte count of *Kaphaj kasa*, *Pittaj kasa* and *Vataj kasa* were not significantly different (P-value = 0.081) as observed by one way ANOVA.

CONCLUSION

The conclusions which can be drawn are as follows-

- In *Vataj kasa* patients we found *Aaharaj hetu* like *Ruksha*, sheet, *Kashay aahar, Langhana*, *Anashana*, *Guru vishtambi aahar* and *Vihar* like *Atimargkramana, Dhur dhul sevana, Ativyayam, Atishram* and *Mansik hetu* like *Shok*, *Bhay*, *Chinta* which causes *Vata prakopa* leading to *Pratiloma gati* of *Apan vayu* resulting into obstruction in *Prakrut gati* of *Pran vayu. Udan vayu* and *Pran vayu gatisngarsha*. *Pranvayu* gets *Pratiloma* direction reaches to *Ura, kantha*, *Kanthanadi* leads to expulsion of *Sadosha Pranvayu* through mouth producing *Kasa* during this *Samprapti* we found *Poorvarupa* like

Shookpurna galasyta, Kanthkandu, *Bhojyana-mavarodh* and *Lakshanas* were *Shushaka kasa, Hrid shool, Shirshool, Swarbheda, Udarshool.*

- In *Pittaj kasa aaharaj hetu* like *Katu, Aamla*, *Lavana, Ushna, Vidahi aahar* and *Viharaj hetu* like *Agnisevana, Aatapsevana* and *Mansik hetu* like *Krodha, Bhay, Shok* are responsible for *Pittaj kasa* which causes *Pitta* and *Kapha prakopa* occurs at *Kantha, Kanthanadi, Ura* Pradesh which leads to expulsion of *Sadosh pranvayu* through producing sound leads to *Pittaj kasa*. During this *Samprapti* we found *Poorvarupas* like *Shookpurnagalasyta*, *kanth-kandu*, *Bhojyanamavrodh* and *Lakshana* like *Urovidah, Trushna, Jwar, Chardi, Pittayukta Kapha shtivan, Kanthadaha, Shirshool*.
- *Hetu* like guru, *Abhishyandi*, *Madhur, Snigdha aahar* and *Vihar* like *Diwaswap* which causes *Kaphaprakopa* and it causes *Strotorodh* hence *Apan vayu* gets *Pratiloma gati* resulting into *Udan vayu* and *Pran vayu*.
- *Gati sangarsha* then *Pran vayu* gets *Pratiloma gati*. At *Kanth, Kanthnadi*, *Ura Pradesh Kapha prakopa* occurs leads to expulsion of *Sadosha pranvayu* through mouth producing sound causes *Kaphaj kasa*. During this *Samprapti* we found *Poorvarupa* like *Shookpurnagalasyta*, *Kanthkandu, Bhojyanamavrodh* and *Lakshana* like *Shiroruja, Kaphashtivan, Kandu, Kasa, Angagaurav, Chardi, Pratishyay, Madhuraasya.*
- In this study there were more number of patients with *Vataj kasa* as compare to *Pittaj* and *Kaphaj kasa*.
- Total leucocyte count was seen more in *Kaphaj kasa* than in *Pittaj* and *Vataj kasa*.

Differential leucocyte count

a. Neutrophil- Neutrophil for *Pittaj kasa* was observed to be significantly higher than that of *Kaphaj kasa* but there was no significant difference between neutrophil of *Pittaj* and *Vataj kasa* as well as *Kaphaj* and *Vataj kasa*.

b. Eosinophil- Eosinophil was significantly observed in *Kaphaj kasa* as compare to *Pittaj* and *Vataj kasa*. Also, significantly increased in *Vataj kasa* than *Pittaj kasa*.

c. Basophil- Basophil was not observed in any of patient included in study.

d. Monocyte- Monocyte was found significant in *Vataj kasa* as compare to *Kaphaj* and *Pittaj kasa*.

e. Lymphocyte- Lymphocyte count was nearly equal for all three *Kasas*. i.e., there was no significant difference between lymphocyte count of three *Kasa – Vataj, Pittaj* and *Kaphaj*.

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