

Clinical evaluation of hareetakyadi gutika on kaphaja kasa

Research article

Deeja CR^{1*}, Satya Priya T⁴, Venkat Shivudu K², Ram Reddy GP³

1. PG-Scholar, 2. Reader, 3. Professor and H.O.D, Dept. of Ayurveda Siddhanta,
4. PG Scholar, Dept of Rasa Shastra
Sri Venkateswara Ayurvedic College, Tirupati, Andhra Pradesh

Abstract

Kasa is one of the most common ailments afflicting the *Pranavaha Srotas*. *Kaphaja Kasa* has been considered to be the cutting edge of the *Doshic* type of *Kasa*, which if neglected or mismanaged, may serve as the substratum for the emergence of a good number of disorders such as *Kshataja Kasa*, *Kshayaja Kasa* and *Tamaka Swasa* etc., which are very difficult to manage.

This clinical study was carried out to evaluate the efficacy of *Hareetakyadi Gutika* in patients suffering from *Kaphaja Kasa* by selecting 30 patients in SV Ayurvedic Medical College Hospital, Tirupati during the period 2011-2012. Patients were given *Hareetakyadi Gutika* in a dose of 12 gm per day in divided doses for 14 days and effect was evaluated on pre-test and post-test design. Statistically significant ($p < 0.01$) results were seen in the subjective symptoms like *Mandagni*, *Gourava*, *Nishteeva* etc., and objective signs like ESR, Neutrophils and Eosinophils counts giving a conclusion that *Hareetakyadi Gutika* is an effective treatment for *Kaphaja Kasa*.

Key words: *Pranavaha Srotas*, *Kaphaja Kasa*, *Hareetakyadi Gutika*

Introduction:

In recent years, there has been an extraordinary increase of incidence related to Respiratory system. According to National center for health statistics, 62 million cases of common cold and cough occurs each year. Cough is the fifth most common symptom for which patients seeks medical care.

Kasa has been described under various categories in the classics of *Ayurveda*— as independent disease (1, 2), Symptom (3) Complication (4) and sequel.

Kaphaja Kasa is a common Upper Respiratory tract ailment prevalent now a days and it is increasingly annoying and irritating the individual in his routine activity.

Ayurveda has a lot to offer in this regard. *Vata* and *Kapha* are the two key pathological factors involved in the *Samprapti* of *Kaphaja Kasa* (5). *Hareetakyadi Gutika* is having *Kapha Vatahara* property. Hence, this effort was made to access the action of drug in *Kaphaja Kasa*.

*Corresponding Author:

Deeja CR

P G Scholar,

S V Ayurvedic College, Tirupathi.

Contact no: +91-8125700893

Email: drdeeja.009@gmail.com

Disease review:

Kaphaja Kasa consists of two words “*Kapha*” and “*Kasa*”. The word *Kapha* is derived from the root *Ke*, meaning “*Shirasi Kena Jalena va palathi*”

(6), that which is produced in the *Shiras* and nourished by *jala*. *Acharya Charaka* has defined *Kasa* as “*Shushko Va Sa Kapho Va api Kasanath Kasaha*” means release of obstructed *vayu* resulting in the production of abnormal sound in the process, which may be productive or dry (7).

Nidana:

The *Nidanas* mentioned in the classics are *Guru, Abhishyandi, Madura, Picchila, Snigdha Ahara sevana, Divaswapna, Vicheshtana, Dhoomopaghata* (8).

Samprapti: (9)

Kapha prakopaka nidana i.e. *Ahara* and *vihara* will leads to *Kapha vriddhi* which results in *Agnimandhya*. Due to *Agnimandhya - Amarasa* will be formed which results in *Rasadathu dusthi*. *Rasadathu dusthi* may lead to *malarupi Kaphavrudhi*, which will cause *srotosangha (Pranavaha)*, due to which *Vatavarodha* occurs; this leads to *Vimarga gamana* of *vata* resulting in occurrence of *Kaphaja Kasa*.

Flow chart no: 1

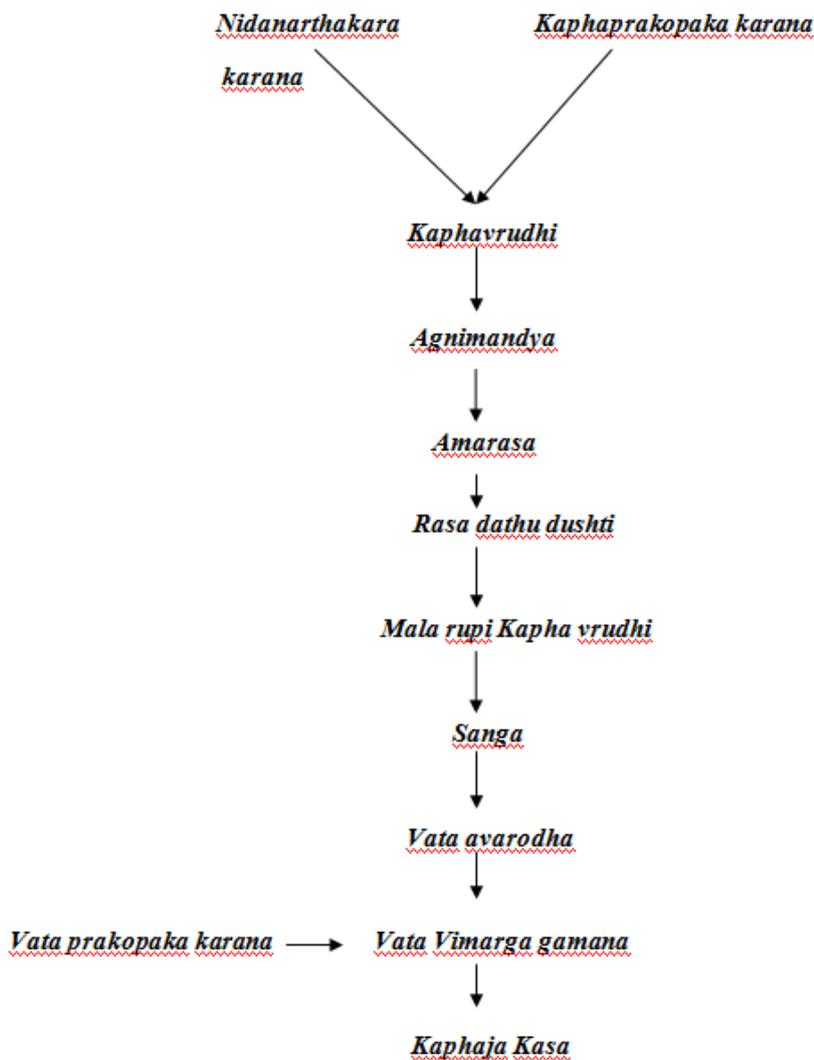


Table no: 1: Showing the *Samprapti ghataka's* of *Kaphaja Kasa*

<i>Dosha</i>	<i>Kapha, Vata</i>
<i>Dushya</i>	<i>Rasa</i>
<i>Agni</i>	<i>Jatharagni mandya</i>
<i>Ama</i>	<i>Jatharagni mandya janya ama</i>
<i>Srotas</i>	<i>Pranavaha & Rasavaha</i>
<i>Sroto dusthi</i>	<i>Sanga</i>
<i>Udbhavasthana</i>	<i>Amashaya</i>
<i>Sancharasthana</i>	<i>Rasayani (Srotas)</i>
<i>Adhishtana</i>	<i>Urah pradesha</i>
<i>Vyaktasthana</i>	<i>Kantha, Mukha</i>
<i>Rogamarga</i>	<i>Abhyantara</i>

Rupa:

Table no: 2 Showing *Visishta lakshanas* of *Kaphaja Kasa* (10)

1.	<i>Kasa</i> (Cough)
2.	<i>Bahala, Snigda, Sweta Nishteevana</i> (Expectoration)
3.	<i>Aruchi</i> (Tastelessness)
4.	<i>Gourava</i> (Heaviness)
5.	<i>Sira soola</i> (Headache)
6.	<i>Mandagni</i> (Loss of appetite)
7.	<i>Peenasa</i> (Running nose)
8.	<i>Utklesa</i> (Excitation)
9.	<i>Kanthe kandu</i> (Itching sensation in throat)
10.	<i>Swarabhedha</i> (Hoarseness of voice)

Note:

Acharya Charaka and Susruta have mentioned first eight symptoms in *Kaphaja Kasa* lakshanas and last the two are associated symptoms.

Table no: 3: Showing interrelation between *Lakshana, Dosha, Vikalpa, Dushya, Srotas & Sthana* in *Kaphaja Kasa*

Lakshanas	Dosha	Vikalpa	Dushya	Srotas	Sthana
<i>Kasa</i>	K, V	<i>Karma</i>	R	P, Ra	<i>Mukha</i>
<i>Bahala, Snigda, Sweta shteevana</i>	K	<i>Drava</i>	R	P	<i>Uras</i>
<i>Aruchi</i>	K	<i>Karma</i>	R	A, Ra	<i>Mukha</i>
<i>Gourava</i>	K	<i>Guru</i>	R	R	<i>Sarvataha</i>
<i>Sira soola</i>	V	<i>Karma</i>	R	A	<i>Siras</i>
<i>Swarabhedha</i>	V	<i>Ruksha</i>	R	Ra, A	<i>Mukha</i>
<i>Peenasa</i>	K	<i>Drava</i>	R	P	<i>Nasa</i>
<i>Kanthe kandu</i>	K	<i>Karma</i>	R	P	<i>Kantha</i>
<i>Utklesa</i>	K	<i>Karma</i>	R	A	<i>Amashaya</i>

Mandagni	K	Guru	R	Ra	Amashaya
----------	---	------	---	----	----------

Note: V = Vata; K = Kapha; R = Rasa; P = Pranavaha; A = Annavaha; Ra = Rasavaha

Drug review:

Hareetakyadi Gutika – Chakradatta Kasarogadhikara (11)

Table No: 4: Showing the ingredients of Hareetakyadi Gutika:

S.No	Ingredients	Botanical name	Part used	Quantity
1.	<i>Hareetaki</i>	<i>Terminalia chebula retz</i>	<i>Phala majja</i>	1 part
2.	<i>Nagara</i>	<i>Zingiber officinale</i>	<i>Kanda</i>	1 part
3.	<i>Musta</i>	<i>Cyperus rotundus</i>	<i>Kanda</i>	1 part
4.	<i>Guda</i>	Double to above drugs		

Mode of preparation:

Hareetaki churna, Nagara churna and Musta churna were taken in equal quantity and to this double quantity of *Guda* was added and made into pills

Properties of ingredients of Hareetakyadi Gutika:

Table no: 5: Showing properties of ingredients

Dravya	Rasa	Guna	Doshaghata	Karma
<i>Hareetaki</i>	<i>Kashaya ++ Pacharasa</i>	<i>Ruksha, Laghu</i>	<i>Tridosahara</i>	<i>Anulomana Rasayana Kasahara Krimighna</i>
<i>Nagara</i>	<i>Katu</i>	<i>Laghu, Tikshna</i>	<i>Vata Kaphahara</i>	<i>Deepana Bhedana Kasahara</i>
<i>Musta</i>	<i>Katu, Tikta</i>	<i>Ruksha, Laghu</i>	<i>Kapha Pitta hara</i>	<i>Deepana Pachana Kapharogahara</i>
<i>Guda-Purana</i>	<i>Madura</i>	<i>Laghu, Pathya</i>	<i>Vata Pitta hara</i>	<i>Anabhysyandi</i>

Administration of the drug:

Mode of administration – orally
 Dose - 1 *Karsha* i.e. 12 gm of gutika in divided doses i.e. on and off (Patient were advised to take the Gutika as per their convenience depending on the severity of the cough. Maximum dose – up to 12 gm, minimum dose- 6 gm)
Anupana – Hot water (*Ushna jala*)
 Duration of treatment- 14 days
 Follow up-After 15 days of treatment

Type of statistical study:

Randomized open trial

Aims and objectives

To evaluate the clinical efficacy of *Hareetakyadi Gutika* in the selected cases of *Kaphaja Kasa* patients.

Materials and methods

Diagnostic criteria:

- Diagnosis was made based on Symptomatology.
- Kaphaja Kasa* less than 10 days duration with Sputum of white in color and thick in consistency were taken for the study.

Statistical criteria:

Patients were selected by random sampling technique i.e. irrespective of sex, caste, religion & occupation; they were advised to visit the hospital every 2 weeks for regular check up & to assess the effect of the therapy there by. In case any patient leaves the trial without completing 14 days treatment and 15 days follow up there after, he / she have declared as dropped out from the research work.

Criteria for selection of cases:

A. Inclusion Criteria:

- a. Patients having classical signs and symptoms of *Kaphaja Kasa*.
- b. Patients having age above 10 years & below 60 years.

B. Exclusion Criteria:

- a. Patients with complication of *Kasa* i.e., Chronic obstructive Bronchitis, Tuberculosis, Bronchiectasis, Lung abscess, Pulmonary edema resulting from Cardiac & Renal disease, Pneumonia have been excluded.
- b. Patients with severe form of other systemic disorders and metabolic diseases.
- c. Pregnant women and lactating mothers.

Criteria for Assessment

Assessment was done under the two headings, subjective and objective assessment.

Subjective Assessment

Main signs and symptoms and associated complaints were given different scores according to their severity, they were recorded before and after treatment

Grading pattern for subjective assessment:

Table no:6: Grading-Kasa

None	No Complaints	0
Mild	Intermittent cough	1

Moderate	Constant cough	2
Severe	Worsened cough	3

Table no:7: Grading-Quality of Sputum

None	No Productive cough	0
Mild	Serous expectoration with traces of thick Sputum	1
Moderate	Moderately thick white in color	2
Severe	Thick large quantity of solid white Sputum	3

Table no: 8: Grading- Aruchi

None	Equal willing to all kinds of food	0
Mild	Willing to some specific foods	1
Moderate	Willing only one <i>rasa</i>	2
Severe	Willing to only most liking foods, (<i>Ushna Ahara</i>)	3

Table no: 9: Grading-Gourava

None	Not present	0
Mild	Frequency of Gourava 1 to 2 times per day	1
Moderate	Frequency of Gourava 3 to 4 times per day	2
Severe	<i>Gourava</i> present daily	3

Table no: 10: Grading-Shira soola

None	Absent	0
Mild	Soola is present only at morning and after intake of food	1
Moderate	Soola is present only at time of cough	2
Severe	Soola is disturbing daily routine.	3

Table no: 11: Grading- Swarabeda

None	0
Mild	1
Moderate	2
Severe	3

Table no: 12: Grading-Peenasa

None	No Nasal discharge	0
Mild	Nasal discharge in less quantity	1
Moderate	Yellowish nasal discharge with heaviness in head and low grade fever	2
Severe	Yellowish discharge in large quantity with headache and fever	3

Table no: 13: Grading-Kanthe kandu

None	0
Mild	1
Moderate	2
Severe	3

Table no: 14: Grading-Utklesa

None	No Utklesa	0
Mild	Utklesa often	1
Moderate	Often, but relieved by vomiting	2
Severe	No relief even after vomiting	3

Table no: 15: Grading- Mandagni

None	Digestion within 3 hours	0
Mild	Digestion within 3-6 hours	1
Moderate	Digestion wit in 6-9 hours	2
Severe	Digestion will take 9- 12 hours	3

Objective Assessment:

Under the objective parameters, laboratory findings were assessed as follows: ESR, Neutrophil and Eosinophil counts were done before treatment, after treatment and for follow up. Data is statistically analyzed by using 't' test.

Assessment of total effect of therapy:

Based on improvement in the subjective and objective parameters of *Kaphaja Kasa*, the following criteria was adopted to evaluate the total efficacy of the therapy.

Table no: 16: Showing criteria for accessing the total efficacy of therapy

Complete remission	75-100% relief in signs and symptoms of <i>Kaphaja Kasa</i>
Moderate improvement	50-74% relief in signs and symptoms of <i>Kaphaja Kasa</i>
Mild improvement	25-49% relief in signs and symptoms of <i>Kaphaja Kasa</i>
No improvement	Less than 25% relief in signs and symptoms of <i>Kaphaja Kasa</i>

Statistical evaluation:

The obtained information was analyzed statistically in terms of Mean score (x), Standard Deviation (S.D.) and Standard Error (S.E.). Paired t-Test was carried out at the level of 0.05, 0.01 and 0.001 of P levels. The results were interpreted as

P > 0.05 – Insignificant

P < 0.05 – Significant

P < 0.01 and P < 0.001 - Highly significant

Observations:

General discussion:

The general observations found in 30 patients of *Kaphaja Kasa* registered in this study are as follows:

Age wise:

Majority of the patients i.e. 43.33% belong to the age group of 20 – 30 yrs, followed by 23.33% in 30-40 yrs age group. There is no age specification mentioned in the disease *Kaphajakasa*. In this study, the probable cause for increasing incidence in 20-40 age groups may be because Persons of this group i.e. 20 to 40 years are more exposed towards the changing external environment owing to their *Vihara* & irregularities in diet like *nidana* for several years, which leads to occurrence of this disease.

Sex wise:

The majority of patients i.e. 66.66% were male and remaining 33.33% were female. This may be due to cumulative effect of following factors especially in male; these are smoking, unavoidable exposure to external pattern, responsibilities to earn for family member to comparison to females.

Occupation wise:

It was observed that more number of patients belongs to labor group (50%) followed by, housewives (26.66%), and students (16.66%). This is because more chance of exposure to allergens like dust, smoke, house dust mite, pollens etc. Many patients admitted that symptoms are going to disappear by change of place. It clearly shows their exposure to allergens in their occupation.

Socio Economic wise:

Maximum numbers of patients observed were from poor class family i.e. 50% followed by 30% of middle class people and remaining 20% of them belonging to well to do family. This might be due to improper hygiene and decreased health awareness in those classes.

Agni wise:

Mandagni was observed in 56.66%. Because as excessive *Kapha* leads to *Mandagni*. In *Kaphaja Kasa*, *Kapha* is the main dosha and here *Agni* remains in *vikruta* state. This creates an imbalance of dosha state and hence cause of the disease.

Predominant Rasa wise:

Maximum percentage of patients 43.33% were taking predominantly *Madhura rasa*. Excessive intake of sweets leads to *Kapha Prakopa* that in turn leads to *Kaphaja Kasa*.

Addiction wise:

According to Text Book of Harsh Mohan pathology, the pathology of smoking creates Respiratory problems and ultimately disease COPD (*Nidannarthakara Roga*). It is single most factor for causing malignancy of lungs.

According to *Ayurveda*, it is *Dhuma* (fumes) factor, which continuously irritate the inner wall of alveoli and cause *Pranavaha Sroto dusthi*. Tobacco is also one factor along with smoking causing cancer of larynx or Oropharynx, parts of upper respiratory tract. Here in the current study 50% patients were smokers and 40% were addicted to tobacco chewing.

30% of patients are tea addicts as it is one of the most popular refreshing drink of India in routine. The modern research shows that it causes bad effect on gastric secretion i.e., *Mandagni*, which ultimately affects *dushya Rasa dhatu* and vitiation of *Vata* and *Kapha dosha*.

History of Recurrent URTI:

The frequency of *Kaphaja Kasa* is much higher in a person who is recurrently suffering from cold. *Acharya Susruta* explained that if *Pratisyaya* is untreated it leads to *Kasa*. In this study, 56.66% of cases had history of recurrent URTI.

Bowel habit:

In current study 56.66% of patients having irregular bowel habits, which indicate dominancy of *Vata*. These persons were having habitual Constipation leading to vitiation of *Vayu*. This is one of the major causes of the disease, which leads to *Pratilomagati* of *Vayu* & thus plays an important role in the pathology of *Kasa*.

Periodicity of cough:

Maximum numbers of 23 (76.66%) cases were having seasonal periodicity. This shows dependency of disease over season.

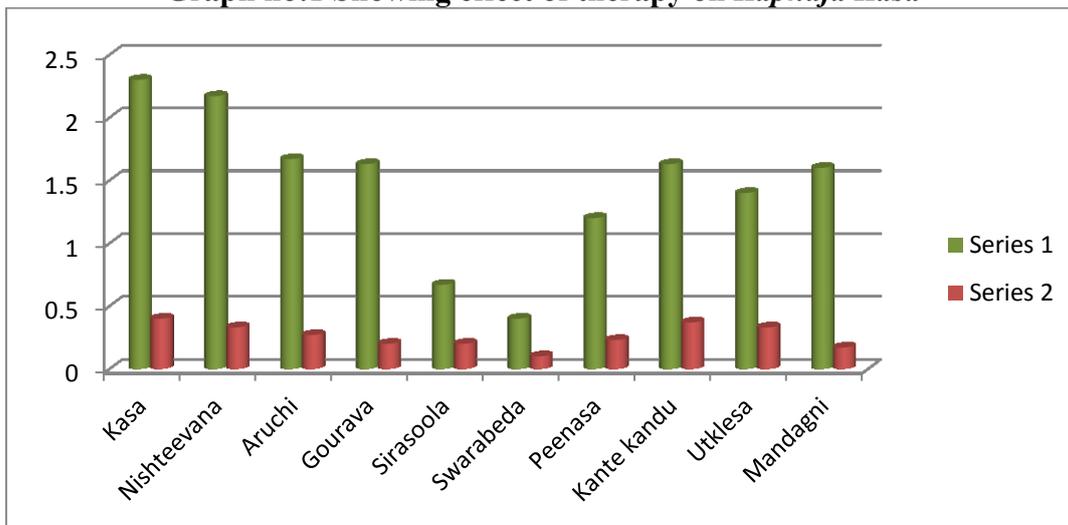
Table No: 17 showing evaluation of the effect of *Hareetakyadi gutika* on Subjective parameters

S.No	Symptoms	N	B.T	A.T	Mean	Relief %	S.D	S.E	t	p
1.	<i>Kasa</i>	30	2.3	0.4	1.9	82%	0.76	0.14	13.7	<0.01
2.	<i>Nishteevana</i>	30	2.17	0.33	1.83	84%	0.69	0.13	14.4	<0.01
3.	<i>Aruchi</i>	30	1.67	0.27	1.4	84%	1.16	0.21	6.6	<0.01
4.	<i>Gourava</i>	30	1.63	0.2	1.43	88%	1.25	0.23	6.3	<0.01
5.	<i>Sira soola</i>	30	0.67	0.2	0.47	70%	0.86	0.16	3.0	<0.01
6.	<i>Swarabeda</i>	30	0.4	0.1	0.3	75%	0.79	0.15	2.1	<0.05
7.	<i>Peenasa</i>	30	1.2	0.23	0.97	81%	0.99	0.18	5.3	<0.01
8.	<i>Kanthe kandu</i>	30	1.63	0.37	1.27	78%	1.11	0.21	6.2	<0.01
9.	<i>Utklesa</i>	30	1.4	0.33	1.07	76%	1.14	0.21	5.1	<0.01
10.	<i>Mandagni</i>	30	1.6	0.17	1.43	90%	1.19	0.22	6.6	<0.01

Table no: 18 Showing effect of therapy on subjective parameters of *Kaphaja Kasa*

Effect on <i>Kasa</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 82%
Effect on <i>Nishteevana</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 84%
Effect on <i>Aruchi</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 84%
Effect on <i>Gourava</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 88%
Effect on <i>Sira soola</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 70%
Effect on <i>Swarabeda</i>	Statistically significant relief (p< .05) Percentage wise relief is 75%
Effect on <i>Peenasa</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 81%
Effect on <i>Kanthe kandu</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 78%
Effect on <i>Utklesa</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 76%
Effect on <i>Mandagni</i>	Statistically highly significant relief (p< .01) Percentage wise relief is 90%

Graph no:1 Showing effect of therapy on *Kaphaja Kasa*



Note: Series 1 – Before treatment mean; Series 2 – After treatment mean

Table No: 19: Showing evaluation of the effect of *Hareetakyadi gutika* on objective parameters

Objective parameter	N	BT	AT	Mean	Relief	S.D	S.E	t	P
ESR	30	29.6	25.4	13.4	45%	8.28	1.51	8.9	<.01
N	30	66	59.7	6.33	9.6%	4.77	.87	7.3	<.01
E	30	6.03	4.0	2	33%	1.17	.37	5.4	<.01

- The effects of therapy on ESR is highly significant results at $p < 0.01$ obtained, i.e. the improvement in the ESR level is 45%
- The effects of therapy on Neutrophil is highly significant results at $p < 0.01$, obtained, 9.6% improvement in Neutrophil level.
- The effect of therapy on Eosinophils is highly significant results at $p < 0.01$, obtained 33 % improvement in Eosinophils levels.

Table no: 20 Showing overall assessment of the clinical trial

Result	No. of patients	%
Complete cure	25	83%
Moderate relief	4	13%
Mild relief	1	3%
Not cured	0	0%

Discussion:

Cough is the commonest Respiratory symptom that has been experienced by every human being. It is having greater influence of environmental factors such as pollutants, allergens,

smoke, dust, etc (12), and this is unavoidable circumstance in the life. The primary action of currently available cough suppressants have significant side effects such as constipation, respiratory depression, dependence, drowsiness etc,

hence there is a current huge unmet need for the development of safe, effective therapeutic options in the treatment of persistent cough as alternative to existing medications.

In *Kaphaja Kasa*, *Kapha dosha* obstructs the *Vata gati* and there by *Vata* takes abnormal path, so while treating one should focus on *Kapha nirharana* as well as normalizing the *Vata gati*.

Hareetakyadi Gutika is having *Ushna veerya* which mitigates the *Vata* and *Kapha*, which directly antagonizing the *Sheeta guna* of the *Vata* and *Kapha*. *Deepana* and *Pachana* property of the *Nagara*, *Musta* and *Guda* makes *Agnivardhana* and *Ama pachana* at the *Amashaya*, therefore, the ultimate goal is achieved i.e. *Kapha* gets mitigate at its own seat. Hence, the vitiation of the *kapha* is under control.

In addition, the above said properties, also enhance the *Dhatwagni* of the *rasa dhatu* which also helps in the controlling the vitiated *Kapha*, as the *Kapha* is *mala* of the *rasadhatu*. *Hareetaki* having *gunas* like *Vaataanulomaka*, *Tridoshhara*, which helps in mitigating *Kapha* and giving *anulomana gati* to *Vata*, which also helps in *Vaatashamana*. Most of the drugs, have *Kashaya*, *Tikta*, *Katu rasa* that helps to alleviate *Kapha dosha*. *Hareetaki* and *Nagara* both of them works in *Kasa*. So with this yoga can achieve better result in this disease.

The aim of the present study was to evaluate effect of an Ayurvedic formulation *Hareetakyadi Gutika* in patients of *Kaphaja Kasa*. Symptomatic relief was observed in 82%, 84%, 84%, 88% and 81% c regarding *Kasa*, *Nishteeva*, *Aruchi*, *Gourava* and in *Peenasa*. Mean ESR level drooped from 29.6 to 25.4, mean Neutrophils count dropped from 66 to 60.7 similarly mean Eosinophil count drooped from 6.03 to 4.1 in the 14 days of study.

Conclusion:

Kaphaja Kasa is a simple Productive Cough associated with cold and throat infection with recent origin and without much infection.

Hareetakyadi Gutika was highly significant in relieving *Mandagni*, *Gourava* and *Nishteeva* and other symptoms with p value < 0.01. It reduced E.S.R. to certain extent and normalized Eosinophil and Neutrophil count.

Recommendation for future study:

Hareetakyadi Gutika and other *Yogas* mentioned for *Kaphaja Kasa* can be studied Comparatively.

Present study pattern can be continued in the form of prospective clinical Study with increased sample size.

As the present study was limited to 14 days, it was not possible to observe the Optimum efficacy of the Trial drug in chronic cases. Further drug may give for more number of days to observe in chronic cases as treatment for best result.

References:

1. Jadhavji Trikamji Acharya, Charaka samhita, Varanasi, Chaukhambha Sanskrit Sansthan ; 2011, 433p
2. Jadhavji Trikamji Acharya, Susruta Samhita, Varanasi, Chaukhambha Sanskrit Sansthan, 2012, 766p
3. Ramavalamba Sastri, Harita Samhita Varanasi, Prachya Prakashan; 1985, 232p
4. Ramavalamba Sastri, Harita Samhita Varanasi, Prachya Prakashan; 1985, 230p
5. Jadhavji Trikamji Acharya, Charaka samhita, Varanasi, Chaukhambha Sanskrit Sansthan ; 2011, 433p .
6. Deva R.K, Shabda kalpa druma, part 2, 2516p
7. Jadhavji Trikamji Acharya, Charaka samhita, Varanasi, Chaukhambha Sanskrit Sansthan ; 2011, 433p

8. Jadhavji Trikamji Acharya, Charaka samhita, Varanasi, Chaukhambha Sanskrit Sansthan ; 2011, 433p
9. Charaka Samhita, Ayurveda deepika commentary, Jadhavji Trikamji Acharya, editor: Varanasi, Chokhambha Sanscrit Sansthan ; 2011, 433p
10. Susruta Sanhita, Nibhandha Sangraha commentary, Jadhavji Trikamji Acharya, editor: Varanasi, Chokhambha Sanscrit Sansthan ; 2012, 766p
11. Cheppat Achyuta Varrier, Chakradattam, 2007, 124p
12. Harrison's Principle's of Internal Medicine-vol.I 16th, McGraw Hill Publication USA2005, 242th chap., 1547pp.
