

International Research Journal of Ayurveda & Yoga

An International Peer Reviewed Journal for Ayurveda & Yoga



A Comprehensive Study On *Krimi* And Its Management Through The Three Fold Principle Of Treatment Of *Charaka Samhita*

Dr. Neetu Jha,¹ Dr. Nabin Kumar Behera², Dr. Sushil Kumar Meher³, Dr. Manoj Kumar Sahoo⁴,
(Prof.) Dr. P.K. Panda⁵

ICV-70.44- ISRA-1.318

VOLUME 4 ISSUE 5

- 1- PG Scholar PG Department of Samhita and Siddhant, Govt. Ayurvedic College & Hospital, Balangir, Odisha
- 2- Lecturer PG Department of Samhita and Siddhant, Govt. Ayurvedic College & Hospital, Balangir, Odisha
- 3- Reader PG Department of Samhita and Siddhant, Govt. Ayurvedic College & Hospital, Balangir, Odisha
- 4- Reader and Head, PG Department of Samhita and Siddhanta, Govt. Ayurvedic College & Hospital, Balangir, Odisha
- 5- Professor and Head, PG Department of Roga Nidan and Vikriti Vigyan, Govt. Ayurvedic College & Hospital, Balangir, Odisha

Corresponding Author:- Dr. Neetu Jha, PG Scholar PG Department of Samhita and Siddhant, Govt. Ayurvedic College & Hospital, Balangir, Odisha, E-mail-neetujha51192@gmail.com

Article revised on 26th April 2021

Article Accepted 20th May 2021

Article published 31st May 2021

ABSTRACT: -

Introduction- *Krimi* (worms) is considered as one of the causative factor for *Aagantuja Vyadhi*. *Krimiroga* (worm infestations) may interrupt growth and development of person and deteriorate the physical condition and leads to malnutrition, if not treated properly. In *Charaka Samhita*, three fold principle of treatment is given to manage *Krimiroga* (worm infestations). This research work has been carried out to assess the treatment principle.

Aim and Objective- To assess the three steps treatment principle i.e. *Apakarshana* (Expulsion of harmful substances through *shodhan chikitsa*), *Prakriti Vighata* (counteracting/ modalities) and *Nidana Parivarjana* (avoiding the cause) depicted by *Acharya Charaka*.

Materials and methods- 30 patients were registered from OPD and IPD of Govt. Ayurvedic College & Hospital, Balangir, presented with Subjective parameters; *Aruchi* (anorexia), *Chardi* (vomiting), *Udarashool* (pain in abdomen), *Vivarnata* (discoloration), *Atisara* (diarrhoea) and *Gudakandu* (Anal itching) and Objective parameters; Haemoglobin (Hb gm%), DC, TLC, ESR and Absolute eosinophilic count (AEC). After diagnosis they were advised for *Nidana Parivarjana* and trialed with Ayurvedic formulations of *Virechana Yoga* (*Trivrit*), which was taken as drug for *Apakarshana* procedure along with *Krimihara Yoga* (*Shigru beeja*, *Palasha beeja*, *Maricha* and *Vidanga*), taken as *Prakriti Vighata dravya*. The assessment of subjective parameters and objective parameters were evaluated in 0th, 7th and 15th day respectively from the day of initiation in order to find the efficacy of both the trial drugs by statistical Wilcoxon test and paired t-test.

Observation and Results- It has been observed that the trial drugs work statistically significant to reduce signs and symptoms that had taken as subjective and objective parameters after 15 days of treatment with p-value < 0.05.

Discussion and Conclusion- So, it can be concluded from this research work that treatment principle given by *Maharshi Charaka* for *Krimiroga* (worm infestations) works effectively. No side effect was noticed during clinical study of three fold treatment principle.

Keywords- *Aagantuja Vyadhi*, *Apakarshana*, *Prakriti Vighata*, *Nidana Parivarjana*



This work is licensed under a creative attribution -Non-commercial-No derivatives 4.0 International License commons

How to cite this article: Dr. Neetu Jha, Dr. Nabin Kumar Behera, Dr. Sushil Kumar Meher, Dr. Manoj Kumar Sahoo, (Prof.) Dr. P.K. Panda "A Comprehensive Study On Krimi And Its Management Through The Three Fold Principle Of Treatment Of Charaka Samhita" IRJAY, May: 2021, Vol-4, Issue-5;1-10 ;
DOI: <https://doi.org/10.47223/IRJAY.2021.4504>

INTRODUCTION

Description of *Krimi* is very old found since *Vedas*¹. *Ayurvedic Acharyas* have described 20 types of *Krimi*² along with their location, causes, symptoms and treatment. *Kaphaja* and *Purishaja krimi* (worms due to vitiated feces) are termed as *kosthagata krimi*³, because they live in the gastrointestinal tract of human. *Kosthagata krimi* harm the host by depriving of food, causing loss of blood, bring injury to the intestine by secreting various types of toxins. So, it may interrupt growth and development of a person. In modern science *Kosthagata Krimi* can be correlated with intestinal protozoa and helminthes⁴. Allopathic medicines have many side effects e.g. allergic reactions, fever, jaundice, urticaria⁵ etc and resistance is also developed against them. *Ayurvedic* drugs are effective and safe for long term use. In *Ayurvedic* literature *Acharya Charaka* has described three fold treatment for *krimi* i.e. *Apakarshana*, *Prakriti Vighata* and *Nidana Parivarjana*⁶. *Apakarshana* means to eliminate the *Dosha*, *Mala* And *Krimi Sanghata* forcefully. It contains most forcible *samshodhana* i.e. *Vaman*(emesis), *Virechana*(purgation), *Shirovirechana* and *Asthapana basti*. *Prakriti Vighata* means destruction of susceptible environment of *krimi* (worms). *Nidana Parivarjana* means to avoid the causative factor. The drug taken for *Apakarshana* procedure is; *Trivrit*⁷ (*Virechaka dravya*) and for *Prakriti Vighata* of *Krimi* four drugs are taken i.e. *Shigru beeja* (*Moringa oleifera*)⁸, *Palasha beeja* (*Butea monosperma*)⁹, *Maricha*¹⁰, (*Piper nigrum*) *Vidanga* (*Embelia ribes*)¹¹. A clinical trial is

carried out to prove the principle of treatment procedures for *Kosthagata Krimi* by implementation of aforesaid medications.

AIM AND OBJECTIVE

- (1) To study the theoretical aspects of *Krimi roga* (worm infestations) according to *Ayurvedic* literature and Modern literature.
- (2) To adopt the principle of treatment depicted by *Maharshi Charaka* for the treatment of *Krimi roga*.
- (3) To assess the treatment of certain *Krimighna dravya* (*Prakriti Vighata*) after implementing *Apakarshana* procedure by *Trivrit* and followed by *Nidana Parivarjana*.
- (4) To study the complication if any occurs during the course of the treatment.

MATERIALS AND METHODS

Selection of Patients:

The total 30 patients were selected by a special proforma covering demography both Subjective and Objective parameters from OPD and IPD of Govt. Ayurvedic College and Hospital, Balangir and Saradesweri Govt. Ayurvedic Hospital, Balangir. The consent of the patients were also taken before clinical trial.

Inclusion Criteria:

- (1) Patients having *kosthagata krimi* as per laboratory report and clinical sign and symptoms as in classical text.
- (2) Patients without systemic disorders.
- (3) Patients age >10 years and <50 years were included in present study.

Exclusion Criteria:

- (1) Pregnant women and lactating mother.
- (2) The patients not having positive laboratory report of krimi.
- (3) The patients <10 years and >50 years.
- (4) Patient undergoing treatment for any other systemic disorder or serious illness were excluded in present study.

Criteria for Investigations:

Stool test (Microscopic examination), Hb%, DC, TLC, ESR and Absolute Eosinophilic Count (AEC) were investigated before and after treatment.

Selection of Drug:

Two medicines (Table No-01)

Table No-01: Showing the pharmacodynamics of drugs¹²

Drug Name	Rasa	Guna	Veerya	Vipaka	Doshakarmata	Quantity taken
Virechana Yoga						
<i>Trivrit</i>	<i>Tikta, katu</i>	<i>Laghu, Ruksha, Tikshna</i>	<i>Ushna</i>	<i>Katu</i>	<i>Kapha-pittashamaka</i>	1 part
Krimihara Yoga						
<i>Maricha</i>	<i>Katu</i>	<i>Laghu, Tikshna</i>	<i>Ushna</i>	<i>Katu</i>	<i>Vata-kaphashamaka</i>	1 part
<i>Shigru beeja</i>	<i>Katu, Tikta</i>	<i>Laghu, Ruksha, Tikshna</i>	<i>Ushna</i>	<i>Katu</i>	<i>Vata-kaphashamaka</i>	2 parts
<i>Palasha beeja</i>	<i>Katu, Tikta, Kashaya</i>	<i>Laghu, Ruksha</i>	<i>Ushna</i>	<i>Katu</i>	<i>Vata-kaphashamaka</i>	6 parts
<i>Vidanga</i>	<i>Katu, Kashaya</i>	<i>Laghu, Ruksha, Tikshna</i>	<i>Ushna</i>	<i>Katu</i>	<i>Vata-kaphashamaka</i>	10 parts

Dose- (1)*Virechana Yoga*- 3 gms; for 10-12 yrs and 5 gms; for above 12 yrs at bed time with warm water for first day.

(2)*Krimihara Yoga*- 3 gms; for 10-12 yrs and 5 gms; for above 12 yrs in empty stomach with jaggery for 15 days.

Assessment Criteria:

The Subjective parameters like *Aruchi* (anorexia), *Chardi* (vomiting), *Udarashool* (pain in abdomen), *Vivarnata* (discoloration),

Virechana Yoga and *Krimihara Yoga* were taken for clinical trial. The drugs of both medicines were identified by the experts of Dept. of Dravyaguna which were approved by DRC and IEC of college and Sambalpur University. Medicines were prepared as per GMP certified method in Mini Pharmacy of College under the supervision of expert of Rasashatra and Bhaisajya Kalpana. The sample of research medicines were sent to ALN Rao Memorial Ayurvedic Medical College and PG Centre, Koppa, Chikmagalur, Karnataka for analytical study.

Atisara (diarrhoea) and *Gudakandu* (anal itching) and Objective parameters like stool test (microscopic examination), Hb gm%, DC, TLC, ESR and AEC were assessed by the grading score from 0 to 3 according to the severity of disease. The overall assessment was done by considering the percentage relief of both parameters and statistical evaluation.

OBSERVATION AND RESULT

The clinical study period of 30 patients were from 30/07/2020 to 30/04/2021. Within the

aforesaid period the demography (Table No-02) based on Age, Sex, Religion etc. along with incidence of *Dasvidha Pariksha* (Table N0-03) were observed and assessed.

Table No-02: Showing the demographic incidence of registered patients (n=30)

Demographic Parameters	Maximum Percentage	Maximum Group
Age	80	10-20 yrs
Sex	56.67	Male
Religion	100	Hindu
Marital Status	86.67	Unmarried
Educational Status	50	Secondary education
Socio-economic Status	73.33	Lower-middle
Habitat	100	Urban
Occupation	80	Student

Table No-03: Showing incidence of *Dashavidha Pariksha* of registered patients (n=30)

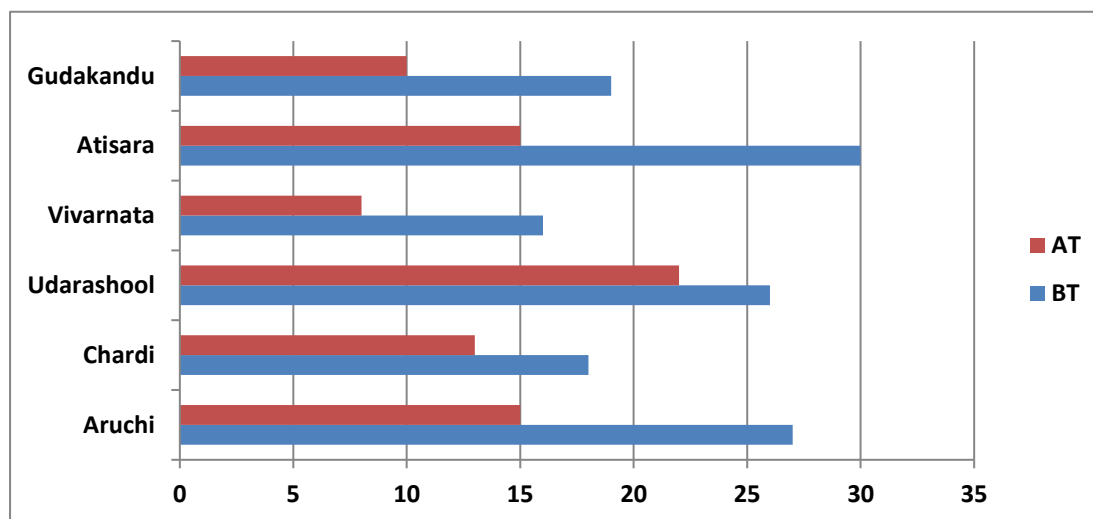
Criteria	Maximum percentage	Category
<i>Prakriti</i>	56.67	<i>Pittakaphaja prakriti</i>
<i>Vikriti</i>	46.67	<i>Alpabala Vyadhi</i>
<i>Sara</i>	53.33	<i>Madhyam sara</i>
<i>Samhanan</i>	53.33	<i>Madhyam samhanan</i>
<i>Pramana</i>	60	<i>Madhyam pramana</i>
<i>Satwa</i>	43.33	<i>Madhyama satwa</i>
<i>Satmya</i>	50	<i>Madhyam satmya</i>
<i>Ahar Shakti</i>	63.33	<i>Madhyam aharshakti</i>
<i>Vyayam Shakti</i>	60	<i>Madhyam vyayamshakti</i>
<i>Vaya</i>	63.33	<i>Balavastha</i>

The clinical features (Subjective Parameters) were observed before treatment and after treatment in individual patients and percentage of improvement was revealed as per Table No-04 and Chart No-01.

Table No-04: Showing the incidence of clinical symptoms before and after treatment (n=30)

Clinical features (Subjective Parameters)	BT		AT		Percentage of improvement
	Frequency	Percentage	Frequency	Percentage	
<i>Aruchi</i> (anorexia)	27	90	15	50	60.53
<i>Chardi</i> (vomiting)	18	60	13	43.33	48.48
<i>Udarashool</i> (pain in abdomen)	26	86.67	22	73.33	62.16
<i>Vivarnata</i> (discoloration)	16	53.33	8	50	52.94
<i>Atisara</i> (diarrhea)	30	100	15	50	60.98
<i>Gudakandu</i> (anal itching)	19	63.33	10	33.33	61.29

Chart No-01: Showing the incidence of Clinical Symptoms in patients before and after treatment (N=30)



The parasites like Ascaris, Hookworm etc were observed microscopically during examination of stool which is placed in Table No-05 with their percentage.

Table No-05: Showing the incidence of Parasitic infestation in patients (n=30)

PARASITE NAME	Frequency	Percentage
<i>Ascaris lumbricoides</i> (Gandupada Krimi) ¹³	16	53.33
<i>Hookworm</i> (Urnanshu-samkash) ¹⁴	8	26.67
<i>Hymenolysis nana</i> (Braghna-sansthana) ¹⁵	5	16.67
<i>Entamoeba histplytica</i> (Suchimukhi Krimi) ¹⁶	12	40
<i>Giardia lamblia</i> (dhanyankura) ¹⁷	7	23.33

The statistical analysis of subjective parameters were observed during the clinical trial period of before treatment and after treatment and were evaluated statistically (Table No-06).

Table No-06: Showing statistical analysis of Subjective parameters (n=30)

Subjective Parameters	Treatment Time	Mean	SD	Median	Z-value	P-value
<i>Aruchi</i>	BT	1.27	0.64	1.0	2.37	<0.001,HS
	AT	0.50	0.51	0.5		
<i>Chardi</i>	BT	1.10	1.09	1.0	2.20	<0.01,S
	AT	0.57	0.73	0.0		
<i>Udarashool</i>	BT	1.23	0.68	1.0	3.18	<0.01,S
	AT	0.47	0.51	0.0		
<i>Vivarnata</i>	BT	0.57	0.57	1.0	2.20	<0.05,S
	AT	0.27	0.45	0.0		
<i>Atisara</i>	BT	1.37	0.56	1.0	2.52	<0.001,HS
	AT	0.53	0.57	0.5		
<i>Gudakandu</i>	BT	1.03	1.00	1.0	2.52	<0.05,S
	AT	0.40	0.62	0.0		

As regards to objective parameters i.e. Hb gm%, DC, TLC, ESR and AEC were also clinically evaluated and statistically calculated and placed in Table No-07 and Table No-08.

Table No-07: Showing statistical analysis of Objective Parameters (n=30)

Objective parameter	Treatment time	Mean	SD	Mean Diff.	SD Diff.	% of change	t-value	p-value
Hb gm%	BT	11.54	1.24	-0.15	0.15	-1.27	-5.19	<0.001,HS
	AT	11.69	1.25					
DC (N)	BT	63.80	5.64	0.40	1.69	0.63	1.29	>0.05,NS
	AT	63.40	5.93					
DC (E)	BT	8.53	3.07	2.53	1.01	29.69	13.77	<0.001,HS
	AT	6.00	2.49					
DC (B)	BT	0.00	0.00	0.00	--	--	--	--
	AT	0.00	0.00					
DC (L)	BT	27.47	7.09	-2.67	2.77	-9.71	-5.27	<0.001,HS
	AT	30.13	7.14					
DC (M)	BT	0.20	0.41	0.07	0.25	33.33	1.44	>0.05, NS
	AT	0.13	0.35					
TLC	BT	8223.33	794.89	21.00	64.71	0.26	1.78	>0.05,NS
	AT	8202.33	799.23					
ESR	BT	13.37	3.86	1.40	1.83	10.47	4.19	<0.001,HS
	AT	11.97	4.18					

Table No-08: Showing statistical analysis of Objective Parameter(AEC) (n=30)

Objective Parameter	Treatment Time	Mean	SD	Median	% of change	Z-value	P-value
AEC	BT	0.80	0.76	1.00	54.16	3.18	<0.005,S
	AT	0.37	0.56	0.00			

DISCUSSION-

Krimiroga (worm infestations) is a global health problem and is a matter of serious concern for the developing countries. In Ayurveda '*Krimi*' is described by various *Acharyas*. Their types, *Swaroopa*, *Lakshana* (sign and symptoms) etc are also given in various Ayurvedic literatures. In Modern science, there is a branch known as 'Microbiology' which includes the study of all microorganisms, helminths, protozoa, bacteria and viruses. According to similarities in morphology, some *Krimi* (worms) can be correlated with Modern science microbes. But not all because of lack of detailed description of individual *Krimi* (worms).

It has been revealed on demography incidence (Table No-02) that mostly children, male, hindu, unmarried, having secondary education, belong to lower-middle class family, residing in urban areas and students were more prone to *Krimiroga* because of not maintaining the hygiene status in their lifestyle.

Individual *Dashavidha Pariksha* (10 fold examination) was covered and observed that (Table No-03) *Pittakaphaja* patients having *Madhyama-Sara-Samhanan-Pramana-Satwa-Satmya-Aharshakti-Vyayamshakti* and in *Balavastha* were manifested with *Krimiroga* (worm infestations). As *Krimiroga* is an *Aagantuja Vyadhi*. So, individuals *Sara*, *Samhanan* etc. are independent of it.

It was observed that number of patients with clinical features in before treatment and after treatment of trial drugs were reduced and revealed that the mean percentage of improvement was 60.53%, 48.48%, 62.16%,

52.94%, 60.98% and 61.29% in *Aruchi*, *Chardi*, *Udarashool Vivarnata*, *Atisara* and *Gudakandu* respectively (Table No-04). Because most of the drugs used in formulations were carminative, stomachic, astringent and tonic. So, they helps to relieve above symptoms.

The microscopic examination of stool of individual patients was conducted and it was observed that 16 (53.33%), 12 (40%), 8 (26.67%), 7 (23.33%) and 5 (16.67%) patients were infected by Roundworm, *Entamoeba histolytica*, Hookworm, *Giardia lamblia* and *H.nana* respectively (Table No-05) and after completing trial drugs, very less quantity of parasites were observed during stool examination may be due to the effectiveness of *Apakarshana* and *Prakriti Vighata* treatment principle.

It was revealed that the Subjective Parameter like *Vivarnata* (discoloration) and *Gudakandu* (itching in anal region) show statistically significant result with p-value<0.05. *Chardi* (vomiting) and *Udarashool* (abdominal pain) features were also statistically significant with p-value<0.01. Highly significant result was revealed in *Aruchi* (anorexia) and *Atisara* (diarrhoea) with p-value<0.001 (Table No-06).

It was revealed that the Objective Parameter like Hb gm% and ESR show statistically highly significant result with p-value<0.001. AEC was statistically significant with p-value<0.005. TLC was statistically insignificant with p-value>0.05. In DC, Neutrophils, Monocytes were showing statistically insignificant result with p-

value>0.05, while statistically highly significant result were revealed in Eosinophils and lymphocytes with p-value<0.001 (Table No-07 and Table No-08).

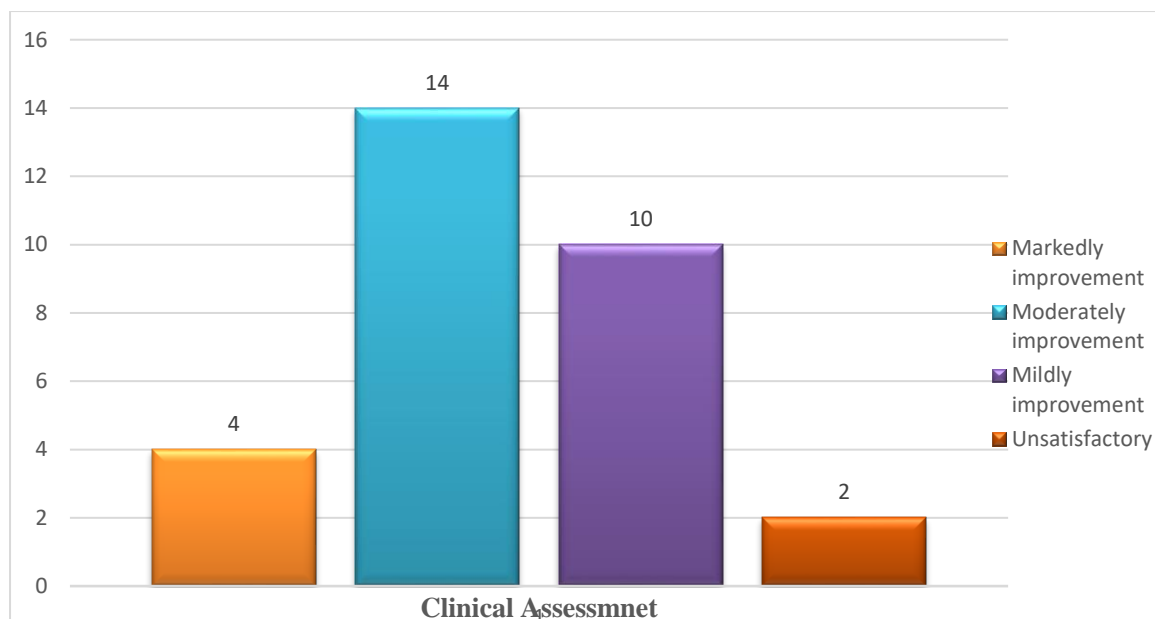
The drugs (Table No-01) were the predominance of *Katu* (pungent), *Tikta*(bitter) *And Kashaya Rasa*(astringent). The *Katu* (pungent), *Tikta*(bitter) *And Kashaya Rasa*(astringent) acts on the vitiated *kapha*. Most of the components had *laghu*(light), *ruksha* (dry)and *tikshana guna* (sharp). Thus the vitiated *kapha* was alleviated by The *Laghu*, *Ruksha*, *Tikshana Guna*. The drugs predominantly having *Ushna Veerya* (hot potency) which acts on vitiated *vata*. The drugs had *katu vipaka* as a result of which *kapha dosha* was alleviated¹⁷. All the drugs were *vata-kapha shamaka* by virtue of which the disease was treated successfully. Most of the drugs having *deepan-pachana* (appetizer-digestive) property. Thus the medicine had the potential

to correct the *agni*. The drugs were having some active principles which were antihelminthic. In *Vidanga*, **Embeline** and **Christembelin** (alkaloid) were present which had special effect on roundworm, hookworm and threadworm. In the same way. *Palasha* had **Palasonin**, which was effective against roundworm. **Pterygospermin** is found in *Shigru*, which has antihelminthic property.

The *Virechan Yoga* (purgative yogas) have purgative property that results in *srotoshodhana*. After that when channels were clear, *Krimighan Yoga* (anthelminthic)was given in empty stomach to improve the efficacy of drugs having *krimighan karma*¹⁸. *Guda* (jaggery) was used for *anupana* of *Krimihara Yoga*. *Guda* having *Madhura rasa*, *Guru guna* and *Madhura Vipaka*, so that it helps to attract *Krimi* (worms)and easily expelled out due to *Anulomana Karma* of *Palashsa* and *Vidanga*.

Table No-09 & Chart No-02: Showing Clinical Assessment of Results in patients (n=30)

Clinical Assessment	No. of Patients	Percentage of relief
Markedly improvement (76-100%)	4	13.33
Moderately improvement (51-75%)	14	46.67
Mildly improvement (26-50%)	10	33.33
Unsatisfactory (below 25%)	2	6.67



It has been revealed that 4 (13.33%), 14 (46.67%) and 10 (33.33%) patients were shown marked, moderate, mild improvement and 2 (6.67%) patient was shown unsatisfactory result (Table No-09 and Chart No-02).

With the detail discussion about the trial drugs for the treatment of *Krimiroga* adopted in the principle by *Maharshi Charaka* is true and can be implemented for the benefits of public.

CONCLUSION

Apakarshana (Expulsion of harmful substances through *shodhan chikitsa*), *Prakriti Vighata* (counteracting/ modalities) and *Nidana Parivarjana* (avoiding the cause) *Virechana Yoga* and *Krimihara Yoga* respectively were provided significant result by reducing the signs and symptoms of *Krimiroga* (worm infestations).¹⁸ All the drugs having anthelmintic property. That results in alleviation of the disease. So, it had been concluded that the three fold treatment principle depicted by *Acharya Charaka* for the management of *Krimiroga* (worm infestations). was found to be very effective. In addition it is more economical and painless treatment with no or minimal side

effects. Present study was carried out with certain limitations like less sample size and shorter duration of treatment time. Forth coming researchers may persue further study in a large sample size over a period of longer duration.

ACKNOWLEDGEMENT

I am very much grateful and thankful to Principal Prof. (Dr.) Arun Ku. Das, Dr. G.B. Acharya (H.O.D Dravyaguna), Dr. S.B. Behera (H.O.D Rasa Shastra & Bhaisajya Kalpana), Dr. P.K. Sahoo (Reader, Kaumarbhritaya), Dr. M.R. Sahu (Lecturer, RNVV), Dr. Ambuja Ku. Biswal (Lecturer and Head incharge, Kaumarbhritaya) for their grateful blessings. I am also thankful to Dr. Esha Dhiman, Dr. Madhusmita Sethi and Dr. Saumyaleena Baral and other all my P.G. Scholar friends, Hospital Staff and other Staff of Samhita & Siddhant dept. for their constant helping attitude to complete the research work with a full satisfaction and belief.

Financial Support: Nil.

Conflict of Interest: Nil

REFERENCES

1. Rigveda Khanda 1, Sutra 191; Krishna Yajurveda 16/63; Atharvaveda 5/29/6.
2. Tripathy Bramhanand. Charaka Samhita. Viman sthan, Vyadharupiya adhyay (Ch.Vi.7/9) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-987
3. Tripathy Bramhanand. Charaka Samhita. Viman sthan, Vyadharupiya adhyay (Ch.Vi.7/27) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-989
4. Article "A review on Ayurvedic concept of Krimi & its management" by Salina Siddiqui, www.ijrap.net.
5. KD Tripathi Essential of Medical Pharmacology- 7th edition, Jaypee Brothers Medical Publishers LTD, Chapter-60, Page no-839.
6. Tripathy Bramhanand. Charaka Samhita. Viman sthan, Vyadharupiya adhyay (Ch.Vi.7/14) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-987
7. Tripathy Bramhanand. Charaka Samhita. Viman sthan, Vyadharupiya adhyay (Ch.Ka.7/3) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-980
8. Tripathy Bramhanand. Charaka Samhita. Sutra sthan, Sadvirechanasatashiriya adhyay (Ch.Vi.4/15) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-675
9. P.V Tiwari Bhavprakash Nighantu, Madhyama Khanda, Choukamba Surbharati Prakashan, Varanasi. 2005 Page no-256
10. Tripathy Bramhanand. Charaka Samhita. Sutra sthan, Sadvirechanasatashiriya adhyay (Ch.Vi.4/15) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-675
11. Tripathy Bramhanand. Charaka Samhita. Sutra sthan, Sadvirechanasatashiriya adhyay (Ch.Vi.4/15) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-675
12. Acharya Priyavrat Sharma Dravya-Guna vigyan, Part-2, Page no-418, 111, 506, 362, 503
13. Kaviraja Ambikadutta Shastri, Susruta Samhita, Edited with Ayurveda Tattva Sandipika Uttar tantra, Krimirogaprathishedha adhyay (Su. U.54/11) Choukamba Surbharati Prakashan, Varanasi. 2005pp-876
14. Tripathy Bramhanand. Charaka Samhita. Viman sthan, Vyadharupiya adhyay (Ch.Vi.7/13) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-675
15. Tripathy Bramhanand. Charaka Samhita. Viman sthan, Vyadharupiya adhyay (Ch.Vi.7/12) Choukamba Surbharati Prakashan, Varanasi. 2005.pp-677
16. Dr. Devendranath Mishra Kaumarbhritya, Vyadhi Khanda, Chapter-14, Choukamba Surbharati Prakashan, Varanasi. 2005, Page no-493
17. Dr.Neha chalmela , Dr.Shiromani mishra , A Comprehensive Study Of Miracle Tree: Shigru- A Review, IRJAY, August: 2020 Vol- 3, Issue- 8; 77-91
18. Kaviraja Ambikadutta Shastri, Susruta Samhita, Edited with Ayurveda Tattva Sandipika Uttar tantra, Krimirogaprathishedha adhyay (Su. U.54/11) Choukamba Surbharati Prakashan, Varanasi. 2005pp-876