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# Comparative clinical study to evaluate the efficacy of *Vartaku Gutika* and *Chitrakadi Vati* in the management of *Grahani Roga* (Irritable Bowel Syndrome)

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## ABSTRACT

**Background:** *Grahani* is a disease of great clinical relevance in modern era because of it's directly link with improper food habits and stressful lifestyle. *Agnimandhya* is root cause of *Amadosha* and it is crucial factor for *Grahani* and causes *Pakwa Apakwa Mala Pravritti*. It can be correlated to irritable bowel syndrome. About 15% of the general populations have symptoms that justify diagnosis of IBS. As in the *Grahani Agnimandhya* is important factor in *Samprapti*, so it should be treated with *Agnivardhan Yogas*. *Vartaku Gutika* which is described in *Chakradatta* as reseach drug and *Chitrakadi Vati* mentioned in *Charak Samhita* for control group. **Objectives:** To evaluate the effect of *Vartaku Gutika* and to compare the effect *Vartaku Gutika* and *Chitrakadi Vati* in the management of *Grahani*. **Methods:** 40 enrolled subjects completed the course of intervention. Randomly they were divided into two groups, group A was given *Chitrakadi Vati* and group B *Vartaku Gutika* abd they were adviced 500 mg of tablet two times after food with *Ushna Jala*, and were adviced to follow *Pathya Aahara*. Statistical analysis with paired t test, Wilcoxon signed rank test, Mann Whitney test, Mc Nemar test and Chi square test was performed for numerical, ordinal and nominal data respectively. **Results:** Statistically significant reduction of *Lakshana* of *Grahani* in both the group was observed. Overall *Vartaku Gutika* has more improvement in compared to *Chitrakadi Vati*. **Conclusion:** Both *Vartaku Gutika* and *Chitrakadi Vati* breaking the pathology of *Grahani*, but in this study *Vartaku Gutika* is more effective than compared to *Chitrakadi Vati*.

**Key words:** *Vartaku Gutika; Chitrakadi Vati; Grahani; IBS*

## INTRODUCTION

Today's world has been adapted to a system of consumption of food which has several adverse effects on human health. Lifestyle changes has compelled us so much that one has so little time to really think what we are eating is a healthy diet!

*Grahani* is a disease of great clinical relevance in modern era because of its direct link with improper food habits and stressful lifestyle. *Mandagni* brings about partial digestion of food, and then enters the circulation, which may move either in an upward or downward direction. When this *Pakva-Apakva Mala* moves downward in gastrointestinal tract it produces a disorder known as *Grahani Gada*.[1]

It can be probably correlated to Irritable Bowel Syndrome. IBS remains a clinical challenge in the 21st century. It is a functional gastrointestinal disorder having high population prevalence characterized by abdominal pain or discomfort and altered bowel habits in the absence of detectable structural abnormalities.[2] Based on more recent scientific knowledge that proposes the interaction of

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multifactorial pathophysiological factors involved in the generation of functional GI disorders, a revised definition was created: Disorder of gut brain interaction (DGBI) to help clarify its meaning.[3] These disorders classified by GI symptoms related to any combination of motility disturbance, visceral hypersensitivity, altered mucosal and immune function, gut micro biota, and /or central nervous system processing. Prevalence of IBS in India varies from 4.2-7.5%, prevalence varied substantially between individual countries, and this variability persisted even when the same diagnostic criteria were applied and identical methodology was used in studies.[4]

At present, the drugs available for the treatment of IBS have only a modest effect on symptom improvement there is no universal algorithm currently exists. Current management of IBS includes stool bulking agents, laxatives, anti-spasmodic, antacids and antidepressants etc. Despite recent advancements in the management of IBS in conventional medicine are merely symptomatic, but the symptomatic management of any disorder is incomplete as it cannot break the chain of pathogenesis. Due to the high prevalence, high healthcare costs and significant negative impact of this disorder on patients' quality of life, the treatment of IBS deserves increased attention. The burden of IBS on society is large, although there is no mortality associated with IBS but it has got poor quality of life and job-related problems.

In *Ayurveda*, *Grahani Roga* is well explained. This detailed study will help to understand the *Samprapti* and *Samprapti Vighatana* by *Ayurvedic* interventions.

As in the *Grahani Agnimandhya* is important factor in the *Samprapti*, so it should be treated with *Agnivardhan Yogas*. I have chosen the drug *Vartaku Gutika*[5] which is described in *Chakradatta* as the research drug and *Chitrakadi Vati* mentioned in *Charak Samhita* for the control group. Hence here an attempt has been made to evaluate the comparative clinical study of *Vartaku Gutika* and *Chitrakadi Vati* in the management of *Grahani*.[6]

## Objectives of the Study

1. To study the literary review of *Grahani*
2. To evaluate the effect of *Vartaku Gutika* in *Grahani*
3. To compare the effect of *Vartaku Gutika* and *Chitrakadi Vati* in the management of *Grahani*

## Materials and Methods

### Hypothesis

$H_0$ - There is no effect of *Varataku Gutika* in the management of *Grahani Roga*

$H_1$ - *Vartaku Gutika* is equally effective as *Chitrakadi Vati* in the management of *Grahani Roga*.

### Source of data

### Literary source

The literary data were collected from central library as well as Kaya Chikitsa department library of Muniyal Institute of Ayurveda Medical Science, Manipal also from journals, periodicals, other published works and internet sources.

### Drug source

Medicines required for the treatment were prepared in MIAMS Manipal Pharmacy.

### Clinical source

Patient diagnosed with *Grahani* who fulfil the inclusion criteria will be randomly selected from OPD and IPD of MIAMS, Manipal and also from the medical camps and referrals.

### Sample source

Patients were selected from OPD and IPD of PG studies in Kayachikitsa in MIAMS hospital, Manipal, Medical Camps and other referrals.

### Methods of collection of data

### Inclusion criteria

- Patients between age group of 18-60 years were selected for the study
- Patients irrespective of sex, religion, occupation were selected for the study

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- Patients having classical signs and symptoms of *Grahani Roga* like *Muhur Badda* and *Drava Mala Pravritti*, *Aruchi*, *Alasya*, *Klama*, *Mukha Vairasya*, *Trishna*, *Tikta Amlodgara, Praseka, Antra Kunjana.*

### Exclusion criteria

- Patients of *Asadhya Lakshna* and *Updrava* of *Grahani* were excluded
- Patients suffering with other systemic disease which interfere with the course of the treatment
- Vulnerable group - pregnant and breast-feeding women

### Diagnostic criteria

By signs and symptoms of *Grahani*

- *Muhur Badda Muhur Shithilita Mala Pravritti*
- *Anaddhordata*
- *Arochaka*
- *Balakshaya*
- *Alasya*
- *Klama*
- *Trishna*
- *Mukha Vairsaya*
- *Tikta Amlodgara*
- *Praseka*
- *Antra Kunjana*
- *Abhyavaran Shakti*
- *Jarana Shakti*

### Rome 3 diagnostic criteria

Recurrent abdominal pain or discomfort at least 3 days per month in the last 3 months associated with 2 or more following:

- Improvement with defecation
- Onset associated with a change in frequency of stool
- Onset associated with a change in form of stool

### Subjective criteria

| Symptoms | Scoring |
|---|---|
| ***Badda Mala*** | |
| Normal once daily | $B_0$ |
| Alternative days | $B_1$ |
| Once in two days | $B_2$ |
| Once in three days | $B_3$ |
| Once in four days | $B_4$ |
| ***Muhur Drava Mala Pravritti*** | |
| Normal once daily | $D_0$ |
| Twice daily | $D_1$ |
| 2-4 times daily | $D_2$ |
| 4-6 times daily | $D_3$ |
| >6 times daily | $D_4$ |
| ***Muhur Muhur Mala Pravritti*** | |
| Normal once daily | $M_0$ |
| Twice daily | $M_1$ |
| 2-4 times daily | $M_2$ |
| 4-6 times daily | $M_3$ |
| >6 times daily | $M_4$ |
| ***Udarshoola* or discomfort** | |
| No abdominal pain | $P_0$ |
| Ocassional/rarely abdominal pain | $P_1$ |
| Intermittent lower abdominal pain, relived by passage of stools & flatus | $P_2$ |
| Continuous pain not relieved by passage of stools and flatus | $P_3$ |
| ***Amayukta Mala*** | |
| No visible mucous in stool | $A_0$ |
| Visible mucous stickled to the stool | $A_1$ |
| Passage of mucous with frequent stool | $A_2$ |
| Passage of large amount of mucous | |

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in stool $A_3$

### Gas or flatulence

No abnormal gas/ flatulence $G_0$

Occasional abdominal distension $G_1$

Frequently abdominal distension with

Increased flatulence & belching $G_2$

Rumbling/ Gargling sound present

In abdomen $G_3$

### Objective parameters

Hb%

Stool examination

### Study design

The study was open lable, comparative clinical on 40 subjects of *Grahani* selected using the convenience sampling techniques.

### Plan of study

### Intervention

### Group A

| | |
|---|---|
| **Sample size** | 20 |
| **Intervention drug** | *Chitrakadi Vati* |
| **Dose** | 500mg twice daily after food |
| **Treatment duration** | 30 days |
| ***Anupana*** | *Ushna Jala* |

### Group B

| | |
|---|---|
| **Sample size** | 20 |
| **Intervention drug** | *Vartaku Gutika* |
| **Dose** | 500mg twice daily after food |
| **Treatment duration** | 30 days |
| ***Anupana*** | *Ushna Jala* |

### Statistical Method

Demographic data and other relevant information was analysed with descriptive statistics. Numerical data was analysed using paired t test, Nominal data was analysed with Mc-Nemar & chi square test and ordinal data analysed with Wilcoxon signed rank test, friedman's test and Mann-whitney test.

The changes with P value <0.005 were considered statistically significant.

## Observations and Results

### Table 1: Showing Age wise distribution

| Age | Group A | Percent | Group B | Percent | Total | % |
|---|---|---|---|---|---|---|
| 20-30 | 9 | 45.0 | 9 | 45.0 | 18 | 45.0 |
| 30-40 | 5 | 25.0 | 3 | 15.0 | 8 | 20.0 |
| 40-50 | 3 | 15.0 | 5 | 25.0 | 8 | 20.0 |
| 50-60 | 3 | 15.0 | 3 | 15.0 | 6 | 15.0 |
| Total | 20 | 100.0 | 20 | 100 | 40 | 100 |

During the clinical study on *Grahani*, Maximum number of study subject i.e., 18(45%) subjects were 20-30yr age, 08 subjects (20%) were between 30-40yr and 08 subjects (20%) were also in 40-50yr, 06 subjects (15%) were between 50-60yr.

### Table 2: Distribution of 40 patients of *Grahani* according to diet.

| Diet | Group A | % | Group B | % | Total | % |
|---|---|---|---|---|---|---|
| *Veg* | 08 | 40.00 | 09 | 45.00 | 17 | 42.5 |
| Mixed | 12 | 60.00 | 11 | 55.00 | 23 | 57.5 |
| Total | 20 | 100 | 20 | 100 | 40 | 100 |

Among the 40 patients of *Grahani*, (57.5%) of patients were having both Veg and Non veg food, followed by (42.5%) patients were having pure vegetarian food.

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**Table 3: Distribution of 40 patients of *Grahani* according to *Agni*.**

| *Agni* | Group A | % | Group B | % | Total | % |
|---|---|---|---|---|---|---|
| *Vishamagni* | 10 | 50.00 | 11 | 55.00 | 21 | 52.5 |
| *Tikshagni* | 02 | 10.00 | 03 | 25.00 | 05 | 12.5 |
| *Mandagni* | 07 | 35.00 | 05 | 15.00 | 12 | 30.0 |
| *Samagni* | 01 | 5.00 | 01 | 5.00 | 02 | 5.00 |
| Total | 20 | 100 | 20 | 100 | 40 | 100 |

Among the 40 patients of *Grahani*, (52.5%) of patients were having *Vishamagni*, followed by (30%) patients of *Mandagni*, (12.5%) with *Tikshnagni* and (5%) with *Mandagni*.

**Table 4: Distribution of 40 patients of *Grahani* according to *Koshta*.**

| *Koshta* | Group A | % | Group B | % | Total | % |
|---|---|---|---|---|---|---|
| Mrudu | 03 | 15.00 | 03 | 15.00 | 06 | 15.00 |
| Madhyam | 10 | 50.00 | 08 | 40.00 | 18 | 45.00 |
| Krur | 07 | 35.00 | 09 | 45.00 | 16 | 40.00 |
| Total | 20 | 100 | 20 | 100 | 40 | 100 |

Among 40 patients of *Grahani*, (45%) of patients had *Madhyam Koshta*, followed by (40%) and (15%) had *Mrudu Koshta*.

**Table 5: Distribution of 40 patients of *Grahani* according to *Satwa*.**

| *Sara* | Group A | Percent | Group B | Percent | Total | % |
|---|---|---|---|---|---|---|
| *Pravar* | 00 | 0.00 | 00 | 0.00 | 00 | 0.00 |
| *Madhyam* | 06 | 30.00 | 08 | 40.00 | 14 | 35.00 |
| *Avar* | 14 | 70.00 | 12 | 60.00 | 26 | 65.00 |
| Total | 20 | 100 | 20 | 100 | 40 | 100 |

Among 40 subjects of *Grahani*, majority of the subjects were having (65%) *Avar Satwa*, followed by (35%) *Madhyam Satwa*..

## RESULTS

### Subjective parameters: Between the group

**Table 6: showing the effect of treatment on *Badda Mala* between the groups with Mann-Whitney U test.**

| Baddamala | N | Mean Rank | | Sum of Ranks | | U value | Z value | P value | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | Group A | Group B | Group A | Group B | | | | |
| **BT** | 20 | 23.38 | 17.63 | 467.50 | 352.50 | 142.50 | -2.510 | 0.012 | **S** |
| **AT** | 20 | 23.95 | 17.05 | 479.00 | 341.00 | 131.00 | -2.127 | 0.033 | **S** |
| **AF** | 20 | 21.10 | 18.90 | 442.00 | 378.00 | 168.00 | -1.114 | 0.265 | **NS** |

Between the group analysis of before and after treatment (at the mean rank of the subordinate level of significance) Mean score of Group A was 23.95 and Group B was 17.05, which showed significant reduction of *Badda Mala* (P-0.033)

At follow up Mean score of group A was 21.05 and group B was 18.90 and value shows non-significant reduction (P-0.265)

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**Table 7: showing the effect of treatment on *Muhur Drava Mala Pravritti* between the groups with Mann-Whitney U test.**

| *Muhur Drava Mala* | N | Mean Rank | | Sum of Ranks | | U value | Z value | P value | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | Group A | Group B | Group A | Group B | | | | |
| BT | 20 | 21.35 | 19.65 | 427.00 | 393.00 | 183.00 | -0.546 | 0.659 | NS |
| AT | 20 | 22.95 | 18.05 | 459.00 | 361.00 | 151.00 | -1.497 | 0.192 | NS |
| AF | 20 | 21.68 | 19.33 | 433.50 | 386.50 | 176.50 | -0.743 | 0.529 | NS |

Between the group analysis of before and after treatment (at the Mean rank of the subordinate level of significance) Mean score of group A was 22.95 and group B was 18.05, which shows non-significant reduction (P-0.192)

After follow up Mean score of group A was 21.68 and group B was 19.33, which shows non-significant reduction (P- 0.529)

**Table 8: Showing the effect of treatment on *Muhur Muhur Mala Pravritti* between the groups with Mann-Whitney U test.**

| *Muhur Muhur Mala* | N | Mean Rank | | Sum of Ranks | | U value | Z value | P value | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | Group A | Group B | Group A | Group B | | | | |
| BT | 20 | 20.48 | 20.53 | 409.50 | 410.50 | 199.50 | -0.16 | 0.989 | NS |
| AT | 20 | 23.75 | 17.25 | 475.00 | 345.00 | 135.00 | -2.083 | 0.081 | NS |
| AF | 20 | 23.90 | 17.10 | 478.00 | 342.00 | 132.00 | -2.115 | 0.068 | NS |

Between the group analysis of before and after treatment (at the Mean rank of the subordinate level of significance) Mean score of group A was 23.75 and group B was 17.25, which shows non-significant reduction (P-0.081)

After follow up Mean score of group A was 23.90 and group B was 17.10, which shows non-significant reduction (P- 0.068)

**Table 9: Showing the effect of treatment on *Udarshoola* between the groups with Mann-Whitney U test.**

| *Udarshoola* | N | Mean Rank | | Sum of Ranks | | U value | Z value | P value | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | Group A | Group B | Group A | Group B | | | | |
| BT | 20 | 19.05 | 21.95 | 381.00 | 439.00 | 171.00 | -0.923 | 0.445 | NS |
| AT | 20 | 21.93 | 19.08 | 438.50 | 381.50 | 171.50 | -0.940 | 0.445 | NS |
| AF | 20 | 24.20 | 16.80 | 484.00 | 336.00 | 126.00 | -2.300 | 0.046 | S |

Between the group analysis of before and after treatment (at the Mean rank of the subordinate level of significance) Mean score of group A was 21.93 and group B was 19.08, which shows non-significant reduction (P-0.445)

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After follow up Mean score of group A was 24.20 and group B was 16.80, which shows significant reduction (P- 0.046)

**Table 10: Showing the effect of treatment on *Amayukta Mala Pravritti* between the groups with Mann-Whitney U test.**

| *Amayukta Mala* | N | Mean Rank | | Sum of Ranks | | U value | Z value | P value | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | Group A | Group B | Group A | Group B | | | | |
| BT | 20 | 19.05 | 21.050 | 390.00 | 430.00 | 180.00 | -0.673 | 0.602 | NS |
| AT | 20 | 24.10 | 16.90 | 482.00 | 338.00 | 128.00 | -2.306 | 0.052 | S |
| AF | 20 | 24.50 | 16.50 | 490.00 | 330.00 | 120.00 | -2.726 | 0.030 | S |

Between the group analysis of before and after treatment (at the Mean rank of the subordinate level of significance) Mean score of group A was 24.10 and group B was 19.60, which shows significant reduction (P- 0.052)

After follow up Mean score of group A was 24.50 and group B was 16.50, which shows significant reduction (P- 0.030)

**Table 11: Showing the effect of treatment on Flatulence between the groups with Mann-Whitney U test.**

| Flatulence | N | Mean Rank | | Sum of Ranks | | U value | Z value | P value | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | Group A | Group B | Group A | Group B | | | | |
| BT | 20 | 20.85 | 20.15 | 417.00 | 403.00 | 193.00 | -0.232 | 0.817 | NS |
| AT | 20 | 22.40 | 18.60 | 448.00 | 372.00 | 162.00 | -1.171 | 0.241 | NS |
| AF | 20 | 22.50 | 18.50 | 450.00 | 370.00 | 160.00 | -1.363 | 0.173 | NS |

Between the group analysis of before and after treatment (at the Mean rank of the subordinate level of significance) Mean score of group A was 22.40 and group B was 18.60, which shows non-significant reduction (P-0.241)

After follow up Mean score of group A was 22.50 and group B was 18.50, which shows non- significant reduction (P- 0.173)

**Objective parameters: between the groups**

**Table 12: Showing the effect of treatment on Ova in stool between the groups with Chi- square test.**

| Groups | BT | | AT | | Chi - square | P value |
|---|---|---|---|---|---|---|
| | Present | Absent | Present | Absent | | |
| Group A | 05 | 15 | 00 | 20 | 0.143 | 0.705 |
| Group B | 04 | 16 | 00 | 20 | | |
| Total | 09 | 31 | 00 | 40 | | |

Between the group analysis of before and after treatment in group A, before treatment was present in 05 subjects and absent in 15, and after treatment was absent in all the subjects. In group B before treatment was present 04 subjects and absent in 16 subjects and after treatment was absent in all the subjects.

**Table 13: Showing the effect of treatment on cyst in stool between the groups with Chi-square test.**

| Groups | BT | | AT | | Chi - square | P value |
|---|---|---|---|---|---|---|
| | Present | Absent | Present | Absent | | |
| Group A | 03 | 17 | 00 | 20 | 0.229 | 0.633 |
| Group B | 02 | 18 | 00 | 20 | | |
| Total | 05 | 35 | 00 | 40 | | |

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Between the group analysis of before and after treatment in group A, before treatment was present in 03 subjects and absent in 17, and after treatment was absent in all the subjects. In group B before treatment was present 02 subjects and absent in 18 subjects and after treatment was absent in all the subjects.

**Table 14: Showing the effect of treatment on pus cells in stool between the groups with Chi- square test.**

| Groups | BT | | AT | | Chi - square | P value |
|---|---|---|---|---|---|---|
| | Present | Absent | Present | Absent | | |
| Group A | 08 | 12 | 00 | 20 | 0.102 | 0.749 |
| Group B | 09 | 11 | 00 | 20 | | |
| Total | 17 | 23 | 00 | 40 | | |

Between the group analysis of before and after treatment in group A, before treatment was present in 08 subjects and absent in 12, and after treatment was absent in all the subjects. In group B before treatment was present 09 subjects and absent in 11 subjects and after treatment was absent in all the subjects.

**Table 15: Showing the effect of treatment on RBC cells in stool between the groups with Chi-square test.**

| Groups | BT | | AT | | Chi - square | P value |
|---|---|---|---|---|---|---|
| | Present | Absent | Present | Absent | | |
| Group A | 00 | 20 | 00 | 20 | 2.105 | 0.147 |
| Group B | 02 | 18 | 00 | 20 | | |
| Total | 02 | 38 | 00 | 40 | | |

Between the group analysis of before and after treatment in group A, before treatment was not present in any subjects, In group B before treatment was present 02 subjects and absent in 18 subjects and after treatment was absent in all the subjects.

**Table 16: Showing overall effect of treatment on parameters of group A and group B after treatment.**

| Parameters | Mean Score | | | | | |
|---|---|---|---|---|---|---|
| | Goup A | | | Group B | | |
| | BT | AT | % | BT | AT | % |
| *Badda Mala* | 2.05 | 0.90 | 56% | 1.75 | 0.45 | 74.28% |
| *Muhur Drava Mala* | 1.8 | 0.8 | 55.5% | 1.7 | 0.45 | 74.2% |
| *Muhur Muhur Mala* | 2.25 | 1.3 | 42.2% | 2.3 | 0.9 | 60.86% |
| *Udarshoola* | 1.55 | 0.85 | 45.16% | 1.75 | 0.70 | 60% |
| *Amayukta Mala* | 1.10 | 0.6 | 45.45% | 1.2 | 0.20 | 83.33% |
| Flatulence | 1.30 | 0.6 | 53.84% | 1.25 | 0.40 | 68% |

## DISCUSSION

### Discussion on observations

### Age

Among the 40 patients of *Grahani*, it was found that highest no. of patients i.e., 45% were between the age group of 20 to 30 years. IBS occurs in all age group. However, worldwide 50% of the patients with IBS report having first had symptoms before the age of 35 years.[7]

In this age group, people usually do *Adhyashana*, *Vishamashana*, *Ratrijagrana* and *Diwaswapna*, which leads to *Tridosha Dushti* - mainly *Samana Vayu*, *Pachak Pitta*, *Kledaka Kapha* and tension, anxiety is much seen in this age group, which leads to *Agni Dushti* and finally, it leads to *Agni Dushti*, finally leads to *Amavastha* of *Grahani Roga*.

### Dietary Habits

Maximum patients 57.5% were mixed diet while 42.5% were vegetarian. Probably *Guru*, *Snigdha* and *Abhishyandi Ahara* may cause indigestion leading to

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formation of *Ama* and resulting in *Grahani*. There are studies that indicates a possibility that symptoms of some IBS patients could be eased by changing into vegetarian diet often means increasing the intake of FODMAP's (Fermentable Oligo-Di-Mono-saccharides and Polyols) which present in for example onions, wheat, fruits and milk; intake of such diet worsen the symptoms.[8]

### *Agni*

Among 40 subjects of *Grahani*, (52.5%) were having *Vishamagni*, followed by (30%) of *Mandagni* and (12.5%) with *Tikshagni*. This may indicate predominance of *Vata Dosha* in *Lakshnas* among the subjects.

### *Koshta*

In the study, 45% of subjects were having *Madhyam Koshta*, followed by 40% of *Krur Koshta* and 15% subjects with *Mrudu Koshta*.

### *Satwa*

Among 40 subjects of *Grahani* 65% had the *Avara Satwa*, which can signify the relation between gut brain axis in IBS.

## Discussion on Results

### *Baddha Mala*

In statistical analysis effect of intervention on *Badda Mala* before and after treatment in Group A with Wilcoxon signed rank test (Z value -2.714 P value 0.007) showed significant reduction in all 20 subjects.

In Group B with Wilcoxon signed rank test (Z value -1.633 P value 0.025) showed significant reduction in all 20 subjects.

Between the groups after treatment Mean was reduced to 0.90 in Group A and 0.45 in Group B

Group B (74.28%) showed more percentage of improvement in *Badda Mala* than group A (56%)

Although action of medicine on the individual symptoms cannot be explained, its action on the *Samprapti*, *Dosha* and *Dushya* can be assessed. *Vartaku* has more significant effect on *Badda Mala* probably because of the *Dravyas* like *Snuhi*, *Arka* and *Lavanas* which can do the action of *Bhedana* and *Ushna Virya* and *Katu*, *Tikta Rasa* which can control the *Vata*.

### *Muhur Drava Mala Pravritti*

In statistical analysis effect of intervention on *Muhur Drava Mala* before and after treatment in Group A with Wilcoxon signed rank test (Z value-3.127 P value<0.001) showed significant reduction in all 20 subjects.

In Group B with Wilcoxon signed rank test (Z value-3.963 P value<0.001) showed significant reduction in all 20 subjects.

Between the groups after treatment Mean was reduced to 0.8 in Group A and 0.45 in Group B.

Group B (74.2%) showed more percentage of improvement in *Muhur Drava Mala Pravritti* than Group A (55.5%)

*Katu, Tikta Rasa* predominance medicine with *Deepana* and *Pachana* property does *Ama Pachana* and *Mala Roopi Kapha Shoshana*, which in turn reduces *Drava Mala Lakshna.*

### *Muhur Muhur Mala Pravritti*

In statistical analysis effect of intervention on *Muhur Muhur Mala Pravritti* before and after treatment Group A with Wilcoxon signed rank test (Z value-3.316 P value<0.001) showed significant reduction in all 20 subjects.

In Group B with Wilcoxon signed rank test (Z value-3.938 P value0.001) showed significant reduction in all 20 subjects.

Group B (60.86%) showed more percentage of improvement in *Muhur Muhur Mala Pravriti* than Group A (42.2%).

### *Udarashoola*

In statistical analysis effect of intervention on *Udarashoola* before and after treatment in Group A with Wilcoxon signed rank test (Z value-3.500 P value<0.001) showed significant reduction in all 20 subjects.

In Group B with wilcoxon signed rank test (Z value-4.739 P value<0.001) showed significant reduction in all 20 subjects.

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Between the groups after treatment Mean was reduced to 0.85 in group A and 0.70 in group B.

Group B (60%) showed more percentage of improvement in *Udarashoola* than group A (45.16%)

Although both the medicine contain *Katu, Tikta Rasa, Ushna Virya* and *Vatahara* property drugs, but *Kshara Guna* of *Vartaku Gutika*, it contains alkaloids (Kwonet al.,2007) Vohora et al., 1984 tested the effect of crude alkaloidal fraction isolated of *Solanum melongena* on the central nervous system. It exhibited significant analgesic effect (Vohora et al., 1984).

### *Amayukta Mala*

In statistical analysis effect of intervention on *Amayukta Mala* before and after treatment in group A with Wilcoxon signed rank test (Z value-2.673 P value0.008) showed dignificant reduction in all 20 subjects.

In group B with Wilcoxon signed rank test (Z value-3.879 P value<0.001) showed significant reduction in all 20 subjects.

Between the groups after treatment Mean was reduced to 0.6 in group A and 0.2 in group B.

Group B (45.4%) showed more percentage of improvement in *Amayukta Mala* than group A (83.33%)

*Katu*, *Tikta Rasa*, *Laghu*, *Kshara Guna* of medicine does the *Ama Pachana* and correct the deranged *Kledaka Kapha* in *Samprapti* of *Grahani* which in turn reduces the *Amayukta Mala Lakshna*.

### Flatulence

In statistical analysis effect of intervention on flatulence before and after treatment Group A with Wilcoxon signed rank test (Z value-3.500 P value <0.001) showed significant reduction in all 20 subjects.

In group B with Wilcoxon signed rank test (Z value-3.532 P value<0.001) showed significant reduction in all 20 subjects.

Between the groups after treatment Mean was reduced to 0.6 in group A and 0.4 in group B.

Group B (68%) showed more percentage of improvement in flatulence than group A (53.84%).

### Discussion on objective parameters

Non-significant improvement in Group A and Group B was seen. As at baseline lab parameters were in almost normal ranges and they remained almost same after completion of the study.

### Discussion on probable mode of action of drugs

### Probable mode of action of *Vartaku Gutika* at different levels

### At the level of *Dosha*

In *Grahani Roga, Saman Vayu, Pachaka Pitta, Kledaka Kapha* these are the main culprits. Because of its *Laghu*, *Tikshna*, *Ruksha Gunas* and *Katu*, *Tikta Rasa* (dominant with *Agni*, *Vayu* and *Akash Mahabhuta*) it subsides the aggrevated *Kapha*.

While, by *Ushna Virya* and *Tikshna*, *Snigdha Guna* it counteracts *Vata*. Due to *Madhura Rasa*, *Snigdha Guna*, *Madhura Vipaka* its balances the *Pitta*.

### At the level of *Dushya*

From the *Samprapti* of *Grahani Roga*, it is cleared that the main *Dushya* involved is *Rasa Dhatu*, most of the drugs from this formulation *Tikta* and *Katu Rasa* which improves the digestion and made first *Dhatu* in proper form, so the combination will act on the *Rasa Dhatu.*

### Probable action on *Srotas*

The disease exhibits three types of *Sroto Dushti* (*Sanga, Vimarga-Gamana, Atipravitti*)

The combination by the virtue of *Deepana, Pachana, Anulomana* property, *Laghu*, *Snigdha*, *Sukshma Guna*, *Tikta Rasa*, *Ushna Virya* relieves *Sanga* type of *Dushti*.

*Anulomana* property relieve from *Vimarga Gamana* type of *Dushti*.

*Deepana*, *Pachana* and *Grahi* property and *Ruksha Guna* decreases *Srotogata Ama* and relives *Atipravritti*.

### Probable action on *Agni* and *Ama* level

By virtue of its *Deepana*, *Pachana* and *Rochana* property, *Katu Tikta Rasa*, *Ushna Virya* it stimulates the

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*Jatharagni* which is the main culprit in *Grahani*. This in turn stops the further *Ama* production and helps into break the basic pathology.

This *Ama Pachana* causes *Srotomukh Shodhana*, Drugs like *Chitraka*, *Snuhi* etc. proved as best *Ama Pachaka*, so the *Yoga* will act as the *Amapachana* and *Agni Deepana*.

**Table 17: Showing Research articles related to each ingredient of *Vartaku Gutika*.**

| Drugs | Research Studies |
|---|---|
| *Chitraka* | Analgesic, Anticancer, Anti-inflammatory, Anti-oxidant, Anti-ulcer, Anti-bacterial[9] |
| *Snuhi* | Laxative, Improves appetite, Digestive, Antispasmodic[10] |
| *Arka* | Anti-inflammatory, Antioxidant, Antidiarrheal, Anticancer, Hepatoprotective, Antipyretic[11] |
| *Saidhava Lavna* | Antacid, Anti-flatulent, Carminative, Digestive stimulant[12] |
| *Suvarcha Lavna* | Laxative and used in Digestive aid[13] |
| *Vida Lavna* | Systemic acidifier, maintain pH and exerts a mild diuretic effect |
| *Vartaku* | Antioxidant, Analgesic, CNS depressant, the beneficial effects on health of chlorogenic acid and related compounds present in minor quantities in eggplants are numerous, and apart from their potent antioxidant activity, they also include free radical scavenging and anti tumoral activities (sawa et al.,1998. Triantis et al.,2005) |

## Conclusion

*Grahani Roga* represents a group of digestive disorder. It is closely linked with *Agnimandhya*, *Koshtha Gata Vata* and *Atisara*. Impaired *Agni* and *Samana Vata* are the most predominant factors in the pathogenesis of *Grahani*. *Prana Vata* and *Apana Vata* also have a significant role in *Grahani*. *Samana Vata Dushti* explained in *Ayurvedic* literatures in *Grahani* can be correlated and understood with the abnormal gut motor activity in IBS, similarly the *Agni Dushti* with that of abnormal gut sensory activity. Central nervous system deregulation can be understood with impaired function of *Prana Vata* with respect to "*Deha Indriya Chitta Drik*." Increased colonic motor activity in IBS due to various factors is similar to the involvement of *Apana Vata* in *Grahani*. Hence total physiologic disturbances mentioned in IBS are similar to *Vata Pitta Dushti* in *Grahani* and involvement of luminal factors in IBS can be explained with the *Kala Hani* in *Grahani*. Diagnostic criteria of IBS i.e., Rome III criteria is same as the *Pratyatmaka Lakshanas* of *Grahani*. Both *Vartaku Gutika* and *Chitrakadi Vati* breaking the pathology of *Grahani*, but in this study *Vartaku Gutika* is more effective than compared to *Chitrakadi Vati*. Null hypothesis is rejected here. Both interventions were well tolerated in the present study and there were no any adverse events reported during study.

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