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Research Article

CLINICOPATHOLOGICAL EVALUATION OF *PANDU* FROM *GRAHANI ROGA* WITH SPECIAL REFERENCES TO HAEMATOLOGICAL PARAMETERS

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ABSTRACT

Ayurveda means wisdom or knowledge of life, is the natural holistic system of medicine. The disease *Grahani* is signified by its nomenclature i.e., incomplete digestion, malabsorption and mal formation of stool. In Ayurveda, *Grahani Roga* (malabsorption syndrome) is a chronic disease of *Annavaha srota* (GI tract) vividly explained in our classics. Above the umbilical region *Grahani* is located, is the seat of *Agni* (digestive enzyme). Main function of *Grahani* is to hold undigested food and after digestion it releases the food through the sides of its lumen. But the main cause behind *Grahani roga* is poor digestive fire and *Amadosa* (products of impaired digestion and metabolism) as per *Caraka Samhita*. It is important symptoms are *Sukta pakam* (fermentation), *Muhu baddha muhu dravam* (alternate pass of hard and loose stool), *Adhman* (flatulence), *Manasa sadanama* (mental frustration) etc. In modern view it is correlated to Mal-Absorption Syndrome (MAS). In *Grahani Roga* the *Pittadhara kala* fails to recognize the digested and undigested food, often release the undigested food towards small intestine. The insufficient digested food is unable to yield the required *Poshak Rasa* (plasma) for transformation of *Rakta* (blood). The person suffers from diminished blood in the system. Hence *Grahani* patients suffer from *Pandu* (anaemia). In this present study 60 cases of *Grahani roga* along with symptoms of *Pandu* were divided into two groups. Group A (30 patients) were treated with *Bhunimba churna.* Group B (30 patients) were treated with *Pippali churna*. The statistical analysis reveals that *Bhunimba churna* statistically more significant than *Pippali churna* in the management of *Grahani roga* and *Pandu*.

INTRODUCTION

In *Charak Samhita* following the sequences of pathogenesis of *Grahani Roga* (malabsorption syndrome) it is to be mentioned that *Pandu* (anemia) is originated from *Grahani Roga*. *Cakrapani* had interpreted that vitiation of *Pitta* in *Grahani* is responsible for production of *Pandu*. Recent clinical co-relation reveals that *Grahani* is a disease compared with mal absorption syndrome of GI tract and *Pandu* is compared with the anemia. Many scholars through their experimental and clinical research had established that mal absorption syndrome and sprue is a causative factor of various type of benign anemia mainly iron deficiency anemia. Hence the present study is aimed to find out the clinical co-relation between *Grahani and Pandu*. For that purpose patient will be selected from OPD and IPD of this institute "Institute of Post Graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra Pith Hospital", in a randomized form. *Bhunimba* (*Andrographis paniculata*) is a well known drug to combat *Pandu* and *Grahani* both. In the present sample the efficacy of *Bhunimba* will be ruled out, through control study in the cases of *Pandu* those who had been previously suffering from *Grahani.*

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MATERIALS AND METHODS

In the present study the patient of *Grahani* will be selected following the criteria of *Samanyaja Grahani* and *Doshaja Grahani*. Those selected patient will be also questioned for the symptomatology of *Pandu*. The patient of *Grahani* if satisfy the symptom of *Pandu*

along with altered gastro intestinal enzyme and positive stool test then they will be included in the study. Objective biochemical and haematological parameters will be done in the laboratory with appropriate interpretation. The selection of the patient will be done following the inclusion and exclusion criteria. The selected patients will be divided as groups, named as group A and group B respectively. Group A will be treated with powder of *Bhunimba (Andrographis paniculata*) and group B will be considered as control group and will be administered with powder of *Pippali (Piper longum)*. The drug will be administered in both the groups in divided doses per day. Before treatment and after treatment data of biochemical and hematological parameters will be recorded for statistical analysis. A complete history sheet will be furnished as case report file (CRF). The dose of *Bhunimba Churna* is 3gm twice daily [1] and *Pippali* is 1.5gm twice daily.[2]

Research Hypothesis

Sequences of *Pandu* in *Grahani* and role of *Bhunimbia churna* to cure *Pandu* along with *Grahani.*

AIMS AND OBJECTIVE

- To study the diagnostic approach of *Grahani.*
- To evaluate the pathogenesis of *Pandu* from *Grahani.*
- To reveal the efficacy of *Bhunimba churna in Grahani* as well as in *Pandu.*

Definition of Problem

The present study is an interventional, prospective, randomized, single blind, control clinical study with 2 groups of which 1 will be treated with *Bhunimba Churna* 6gm in divided dosages in a day and another will be treated with *Pippali churna* 3gm in divided dosages.

Duration of Study: Two years

Study Population: A small sample will be taken from population those who are suffering from *Grahani*, presenting *Pandu*, visiting the OPD & IPD of I.P.G.A.E. & R at S.V.S.P Hospital.

Sample Size and Design

Sampling will be done with a method of simple random sampling. The study will be conducted with a target of at least 30-40 completed cases in each group. Since the trial medication will be given to only one half of the sample and the other will be treated as control group assuming a 30% drop out rate. This trans state will give a figure of approximately 80 subjects to recruit after screening to achieve the target sample size of not less than 30 in each group.

Control Group Required or Not

The sample will be divided into 2 groups, Gr- A & Gr- B respectively. Gr. A will be treated with *Bhunimba churna* and Gr. B will be treated with *Pippali*. Gr. –B will be considered as control.

Inclusion Criteria in Group – A & Group – B

i. Adult subjects of either sex between 16-60 yrs of age.
ii. Presence of cardinal signs and symptoms of *Grahani with Pandu.*
iii. Stool examination showing infectious origin either of protozoa, helminthes.
iv. Willingness to give written consent to participate in the study.
v. Patient those who are not receiving any other therapies except research medicine.

Exclusion Criteria in Group- A & Group- B

i. Tropical enteropathy, due to any malignant causes such as immuno proliferative small intestinal disease and small bowel lymphoma.
ii. Pancreatic disease and tropical pancreatitis.
iii. Coeliac disease and Chron's disease, Colon Tuberculosis.
iv. Malignancy of any other origin.
v. Anaemia of any malignant origin.

Schedule of Data Collection

The drug will be administered for 90 consecutive days for each patient for both the groups and will be assessed after 90 days after the date of registration. The case report form will be filled up in both the groups and the baseline parameter should be recorded. In both the groups, the following laboratory investigations will be conducted during baseline and final follow up.

Laboratory Investigations

Stool Examination

Macroscopic examination

Chemical examination

Microscopical examination

Haematological Investigation

CBC

Serum Ferritin

Haemoglobin Electrophoresis

Screening Criteria for *Grahani*

1. *Sukta pakam* (fermentation)
2. *Kharangata* (roughness of body parts)
3. *Karsya* (emaciation)
4. *Parikartika* [3] (cutting pain in the rectum)
5. *Jirne jiryati ca adhmanama* (flatulence after and during the process of digestion).
6. *Bhukte swasthyama upaiti ca* (temporary feeling of relief immediately after the intake of food).
7. *Cirad dukhama dravama suṣkam tanu amam sabda phenavat* (with difficulty patient passes stool,which is liquid mixed with hard stool, thin associated with mucous, sound and froth).
8. *Punah punah sṛijed varca* (patients void stool frequently).

9. *Puti amla udgara*[4] (patient suffers from eructation having foul smell and sour taste).
10. *Hrid kantha daha* (burning sensation in cardiac region and throat).
11. *Aruci* (anorexia)
12. *Trit* (morbid thirst)
13. *Hrllasa* (suffers from nausea)
14. *Asyaupadeha madhuryama* (stickiness and sweet taste in the mouth).
15. *Dusta Madhura udgara*[5] (eructation with foul smell and sweet taste).

Screening Criteria for *Pandu*

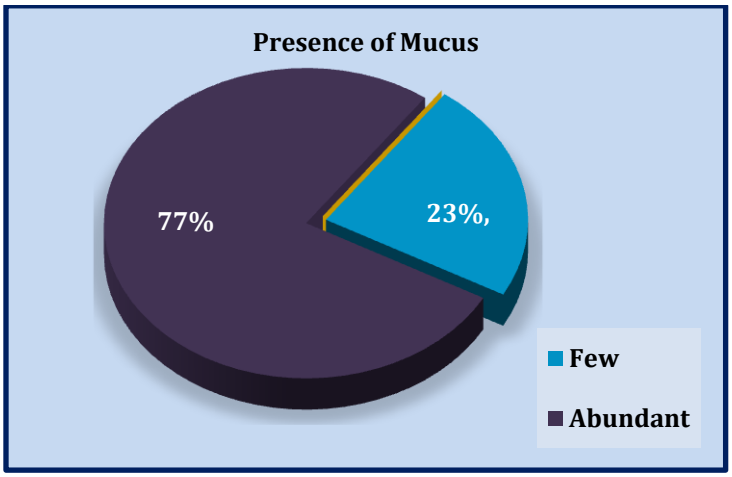
1. *Karnaksveda* [6] (tinnitus)
2. *Hatanala* (suppression of the power of digestion).
3. *Annadvit* (repugnance against food)
4. *Svasa* (dyspnoea)
5. *Mriditairiva gatra* (he feels as if all the limbs of his body are being kneaded).
6. *Sunaksikuta* (he suffers from swelling from orbital region).
7. *Harita* (complexion becomes green)
8. *Hataprabha* (he loses his bodily lustre)
9. *Pindikodvestana* (suffers from cramps in the calf region).
10. *Arohana ayasa* (while making efforts for climbing he suffers pain and weakness in lumber region).

OBSERVATIONS

Table 1: Distribution of 60 Patients of *Grahani* showing the incidence of presence of mucus in stool

S.No	Presence of mucus	No.of Patients	Percentage (%)
1.	Few	14	23%
2.	Abundant	46	77%
Total		60	100%

Table 1 show that abundant amount of mucus was present in 77% of patients, few amount of mucus was present in 23% of patients.

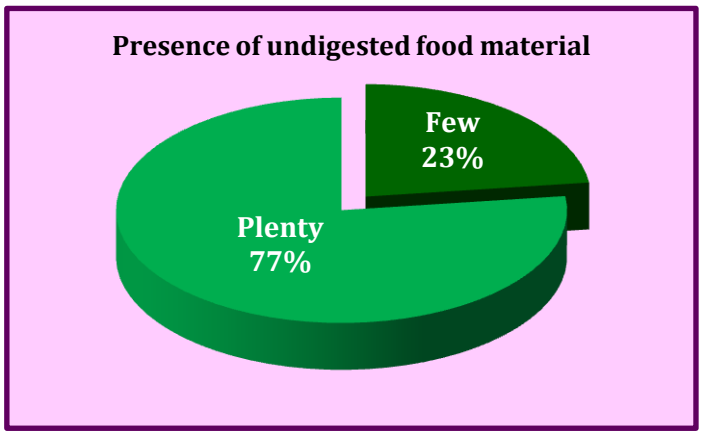


Graph 1: Distribution of 60 Patients of *Grahani* showing the incidence of presence of mucus in stool

Table 2: Distribution of 60 Patients of *Grahani* showing the incidence of presence of undigested food material in stool

S.No	Presence of undigested food material	No. of Patient	Percentage (%)
1.	Few	14	23%
2.	Plenty	46	77%
Total		60	100%

Table 2 show that undigested food was present in plenty in 77% of patients which was maximum, 23% patients had few.

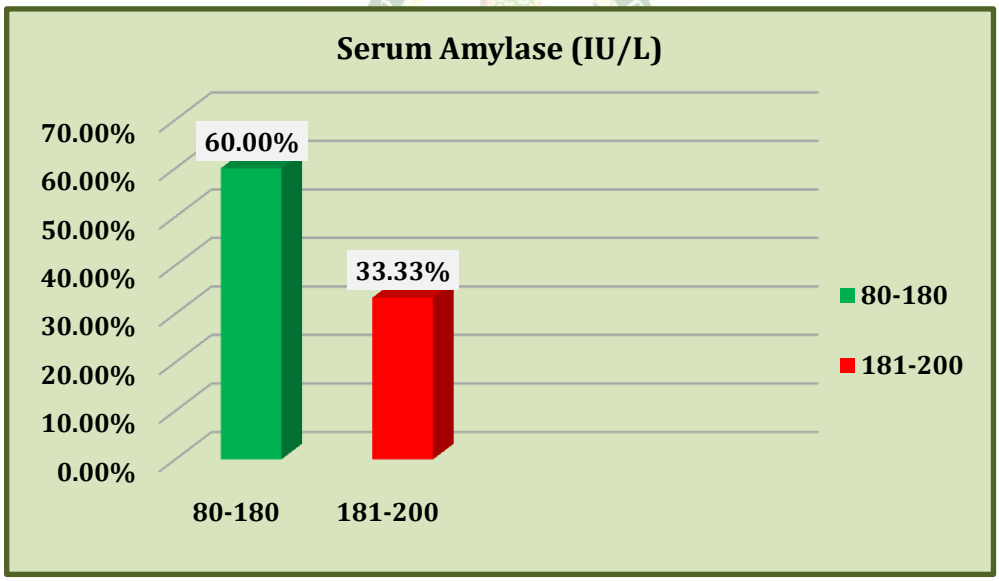


Graph 2: Distribution of 60 Patients of *Grahani* showing the incidence of presence of undigested food material in stool

Table 3: Shows the distribution of 60 Patients of *Grahani* the biochemical assessment of level of serum amylase

S.No.	Serum Amylase (IU/L)	No of Patients (n=60)	Percentage (%)
1.	80-180	36	60%
2.	181-200	24	40%
Total		60	100%

Table 3 shows that the maximum number of patients i.e., 60% are satisfying the range of Amylase value within (80-180) IU/L, 40% patients are satisfying the range of Amylase value within (181-200) IU/L.

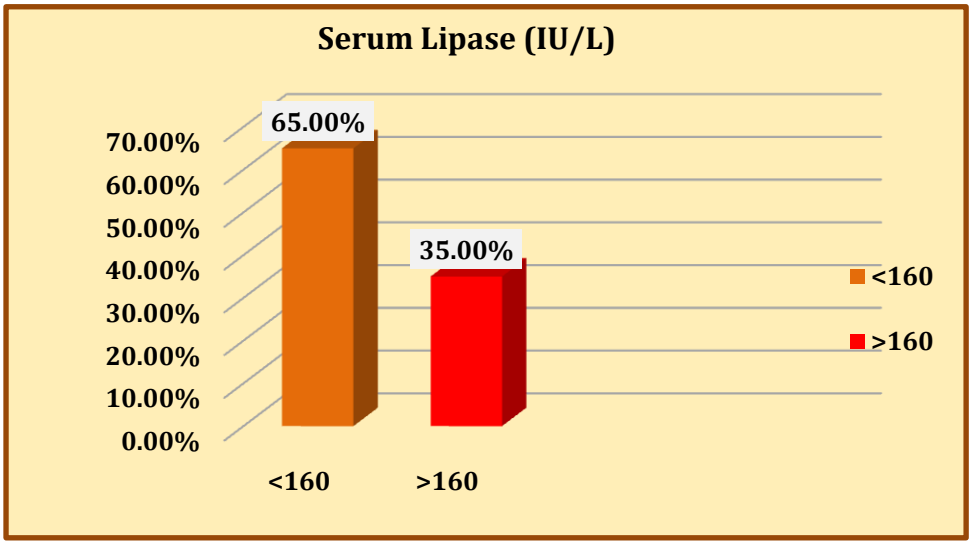


Graph 3: Shows the distribution of 60 Patients of *Grahani* the biochemical assessment of level of serum amylase

Table 4: Distribution of 60 Patients of *Grahani* showing the biochemical assessment of level of serum Lipase

S.No	Serum Lipase (IU/L)	No. of Patients (n=60)	Percentage (%)
1.	<160	39	65%
2.	>160	21	35%
Total		60	100%

Table 4 show that the maximum number of patients i.e. 65% are satisfying the range of Lipase value <160 IU/L, 35% patients are satisfying the range of Lipase value >160 IU/L.

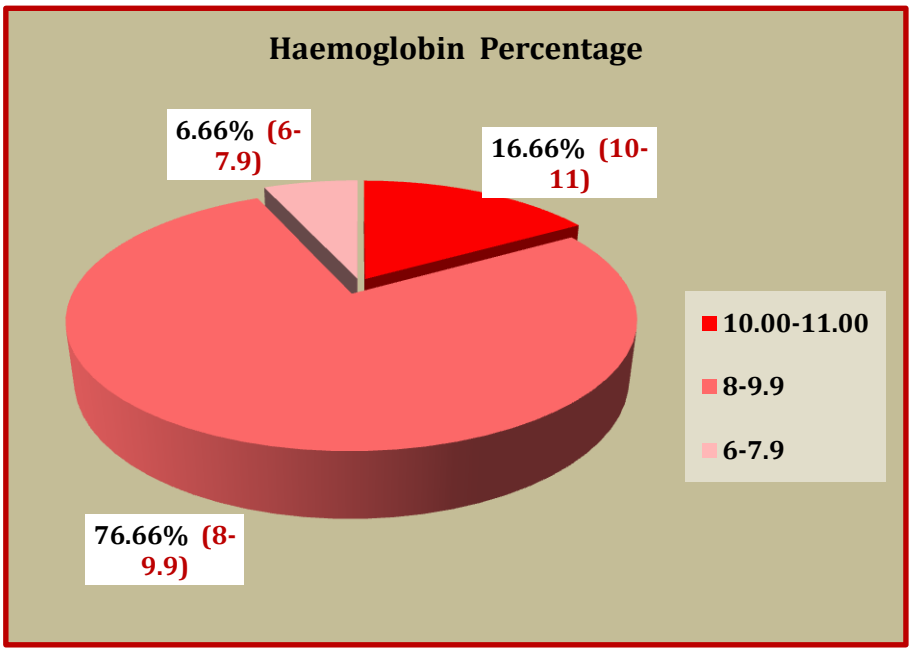


Graph 4: Distribution of 60 Patients of *Grahani* showing the biochemical assessment of level of serum Lipase

Table 5: Shows the Haematological assessment of Haemoglobin percentage through complete blood count in 60 cases of *Grahani*

S.No.	Haemoglobin percentage	No. of Patients	Percentage (%)
1.	10-11	10	16.66%
2.	8-9.9	46	76.66%
3.	6-7.9	04	6.66%
Total		60	100%

Table 5 shows that maximum number of patients i.e., 76.66% are satisfying the range of haemoglobin count within (8-9.9)gm/dl, the next percentage are distributed as 16.66% and 6.66% ranging (10-11) gm/dl and (6-7.9)gm/dl respectively.

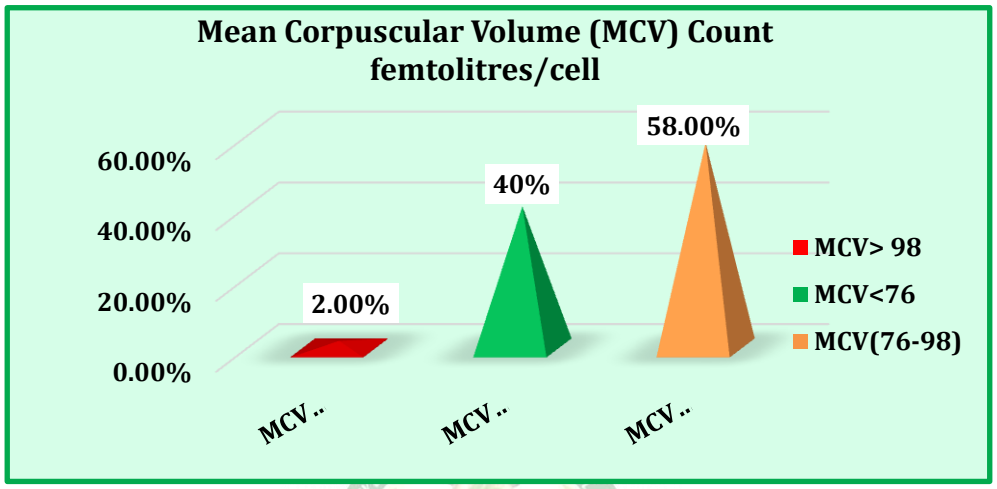


Graph 5: shows the Haematological assessment of Haemoglobin percentage through complete blood count in 60 cases of *Grahani*

Table 6: Shows the Haematological significance of MCV in 60 cases in *Grahani* through CBC count

S.No	Mean Corpuscular Volume (MCV) Count femtolitres/cell	No. of Patients	Percentage (%)
1.	MCV> 98	1	2%
2.	MCV<76	24	40%
3.	MCV (76-98)	35	58%
Total		60	100%

Table 6 shows that the majority of the patients i.e. 58% are showing MCV within normal limit, rest 40% are showing MCV<76 and that is notable as significant in content to this study, 2% is showing MCV >98.

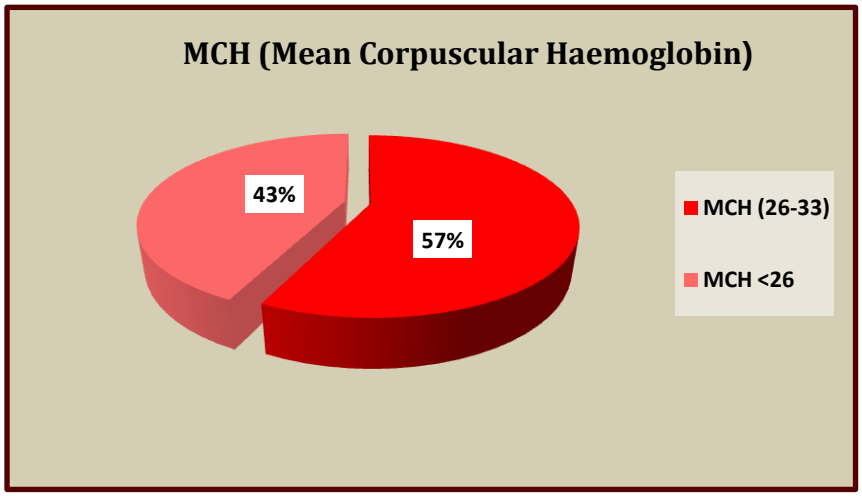


Graph 6. shows the Haematological significance of MCV in 60 cases in *Grahani* through CBC count

Table 7: shows the Haematological significance of MCH (Mean Corpuscular Haemoglobin) in 60 cases of *Grahani*

S.No	MCH Count (Picograms)	No. of Patients	Percentage (%)
1.	MCH (26-33)	34	57%
2.	MCH<26	26	43%
Total		60	100%

Table 7 shows that the large group of patients i.e., 57% are showing MCH within normal limits, again 43% patients are having MCH <26 and i.e., significant in context to the study.

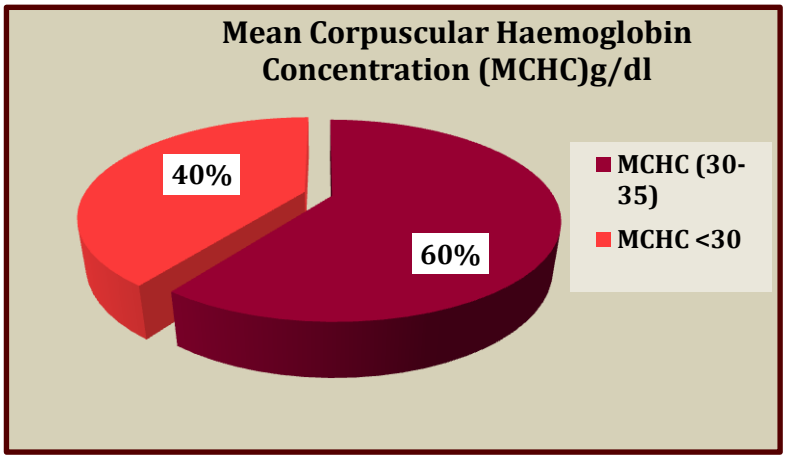


Graph 7: shows the Haematological significance of MCH (Mean Corpuscular Haemoglobin) in 60 cases of *Grahani*.

Table 8: Shows the Haematological significance of MCHC in 60 cases of *Grahani*

S.No	Mean Corpuscular Haemoglobin Concentration (MCHC)g/dl	No. of Patients	Percentage (%)
1.	MCHC(30-35)	36	60%
2.	MCHC<30	24	40%
Total		60	100%

Table 8 shows that the larger group of patients i.e., 60% are showing the normal range of MCHC but the rest 40% are also significant in context to this study.

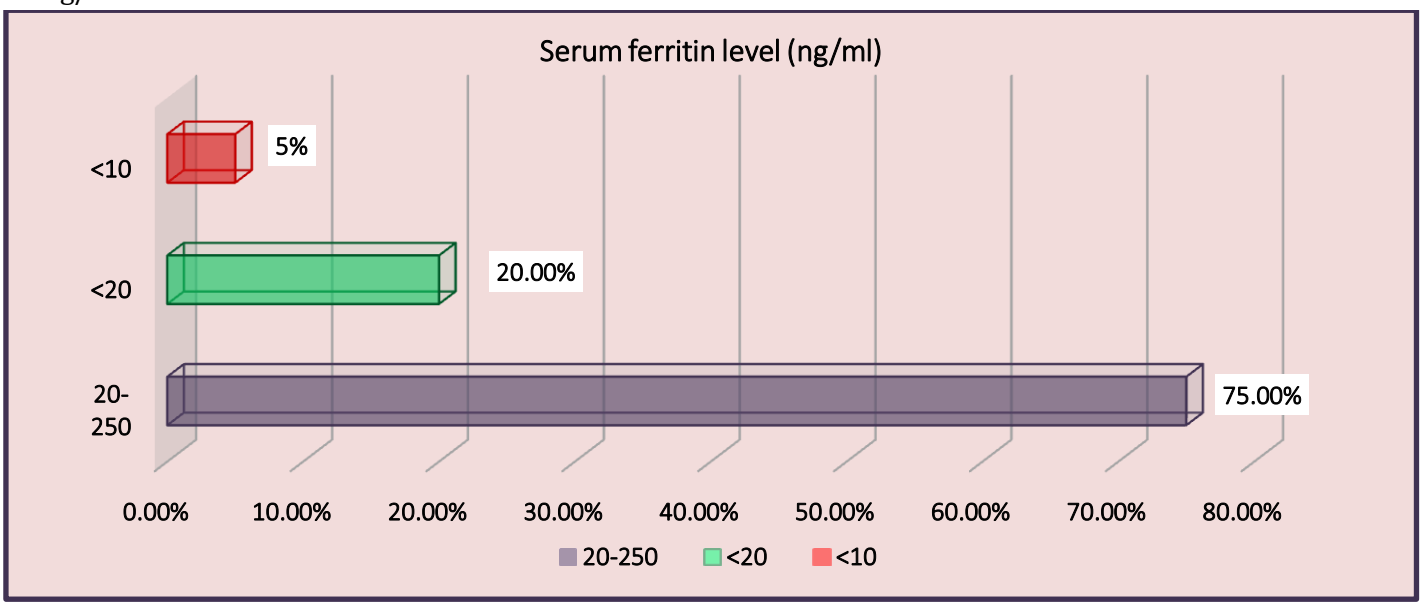


Graph 8: Shows the Haematological significance of MCHC in 60 cases of *Grahani*

Table 9. Shows the result of serum ferritin in 60 cases in *Grahani*

SL.No	Serum ferritin level (ng/ml)	No. of Patients	Percentage (%)
1.	20-250	45	75%
2.	<20	12	20%
3.	<10	03	5%
	Total	60	100%

Table 9 shows that the majority of the patients i.e., 75% belonging to range of serum ferritin (20-250)ng/ml, 20% of patients belongs to the range of serum ferritin <20 ng/ml, 5% patients belongs to the range of serum ferritin <10ng/ml.



Graph 9: Shows the result of serum ferritin in 60 cases in *Grahani*

RESULT

The present study is an interventional, prospective, randomized, single blind, control clinical study, comprising two groups as mentioned as Group A and Group B. Group A is the experimental group and Group B is the control group. Group A contains 30 patients those who are treated with *Bhunimba curna* and Group B contains 30 patients, treated with *Pippali curna*.

Paired 't' test is done in Group A individually to assess the therapeutic efficacy of the drug *Bhunimba*. Before treatment and after treatment value of haemoglobin count is taken as assessment criteria and the result of the same is computed as below.

Table 10: Shows the obtained t test for Group A treated with *Bhunimba*

Mean value	SD	SE	t value	P value
2.95	± 0.91	± 0.16	18.43	<0.001

The Comparative Analysis Between Two Groups

Computation of SD^2 or combined variance of unpaired 't' test yields 't' value i.e $^{t}/_{n-2}$ or $t_{58} = 2.7$

Interpretation of Result of Comparative Analysis

Pooled degree of freedom $= n_1 + n_2 - 2$

$= 30+30 - 2$

$= 58$

At 58 df the highest obtained value of 't' at 1% level of significance is 2.7 as found on reference to table (Appendix-2, Ref: Mahajan B.K method of biostatistics, pg-329). The 't' value of experiment is calculated as 2.7 which is much more higher than highest obtainable value 2.02, by chance. Thus the probability of occurrence (p of the value obtained 2.7) by chance is much than 0.05 the critical value or 5% level of significance. It can occur less than 1 times in 100 i.e., very rarely by chance. Thus difference is real in 99% experiment, hence highly significant. It is interpreted as

't' = 2.7, P<0.01 and significant at 1% level.

This result proves that *Bhunimba* to cure *Grahani* and raise haemoglobin level i.e., responsible for different between two groups.

DISCUSSION

Table No 1, 2 showed the evidence of abundant mucus and plenty undigested food material in 77%, 77% respectively. These data reveals the incidence of indigestion and mal absorption in the gastro intestinal level in especially in stomach duodenum and small intestine. These evidence favours the findings of the research workers, on the point of view that the *Grahani Roga* may be co-related with malabsorption syndrome.

Table No 3 and 4: Showing that more than 40% and 35% of patients are showing altered level of serum amylase and serum lipase. Altered level of serum lipase and amylase certainly denotes the state of indigestion at the gastro intestinal level, though most of the patient of the sample satisfy the criteria of *Ajirna ahara* (undigested food) but all these patients entirely does not match the objective criteria of gastro intestinal enzyme surge. This may occur when the patients are in initial stage of chronic *Grahani Roga.* Altered enzyme levels may found in advance cases of indigestion.

Table No 5: Reveals that major percentage of the sample those who are suffering in *Grahani* showing low haemoglobin percentage. Some portion of the ingested food remains undigested and produce mal formed stool. Due to indigestion of the food the system is unable to collect the proper nutrition from the extract of the food, this condition may be co-related with the malabsorption syndrome where the surface villi of small intestine is unable to absorb the nutritional portion of the food. The immediate *Dhatu* (fundamental tissue) after *Rasa* (plasma) is *Rakta* (blood). *Rakta* takes immediate nutrition from *Ahara* (food). In this condition of insufficient absorption of nutrition *Rakta* is not produced from *Rasa* and hence the clinical situation of *Pandu* arises.

Table No 6, 7, 8, 9: Reveals that the patient of *Grahani* those who are suffering from *Pandu* mostly showing the incidence of iron deficiency anaemia which certainly supports the incidence of nutritional anaemia, which has been caused due to indigestion and malabsorption at the level of *Amasaya* (stomach) and *Grahani* i.e., stomach, duodenum and small intestine.

CONCLUSION

Grahani roga is included in eight major disease which is hard to diagnose and difficult to cure. The decreased hemoglobin percentage of patient denotes that majority of the patient suffers from anaemia in

MAS. The experimental group treated with *Bhunimba* (*Andrographis paniculata*) shows that *Bhunimba* is an excellent drug to cure *Pandu* by correcting the mal absorption and indigestion. No adverse effects of drugs were observed in this study. Therefore, it is to be concluded that *Pandu* occurs in *Grahani* and *Bhunimba* is an excellent drug to treat it.

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