

A RANDOMISED CONTROLLED CLINICAL STUDY TO EVALUATE EFFICACY OF SAPTACHAKRA CHURNA (SALACIA RETICULATA) IN MADHUMEHA W.S.R TYPE-2 DM

Javeed Chougala^{1*}, Surekha Pai² and Babu Paul³

¹P.G Scholar, Department of Kayachikitsa, Alva's Ayurveda Medical College and Hospital, Moodubidire, Dist: Dakshin Kannada, Karnataka, India.

²Professor, P.G Studies – Department of Kayachikitsa, Alva's Ayurveda Medical College and Hospital, Moodubidire, Dist: Dakshin Kannada, Karnataka, India.

³Assistant Professor, P.G Studies – Department of Kayachikitsa, Alva's Ayurveda Medical College and Hospital, Moodubidire, Dist: Dakshin Kannada, Karnataka, India.

Article Received on
27 November 2023,

Revised on 17 Dec. 2023,
Accepted on 07 Jan. 2024

DOI: 10.20959/wjpr20242-30954



***Corresponding Author**

Dr. Javeed Chougala

P.G Scholar, Department
of Kayachikitsa, Alva's
Ayurveda Medical College
and Hospital, Moodubidire,
Dist: Dakshin Kannada,
Karnataka, India.

ABSTRACT

Background: Madhumeha is one among the Ashta Mahagadas,^[1] It explained as one of the Vata pradhana tridoshaja vyadi.^[2,3] Acc. to *Sushruta* these are 2 types, Pathophysiologically its *Dhatu kshayaja* and *Avarnaja*.^[2] This Madhumeha is correlates with the Diabetes Mellitus in modern science, Diabetes is the metabolic disorder associated with hyperglycemia. If not controlled in time leads to end stage renal disease.^[4] India is expected to be the 'World Diabetes capital' because India has genetic predisposition to develop Diabetes mellitus which is further precipitated by life style.^[4] This study focuses on comparative effect of the *Saptachakra churna* and *Amalaki churna* in *Madhumeha* w.s.r to Type – 2 Diabetes mellitus. *Saptachakra* is the drug which explained by *Vaidhya Priyavat Sharma*^[5] and in *Phalashruti* its exclusively indicated for *Madhumeha* and *Yakrut rogas*.^[5,6,7] **Materials and Methods:** A randomised controlled clinical study was conducted among 60 subjects, they were randomly allocated

into two equal groups, Group A subjects received *Saptachakra churna* and Group B subjects received *Amalaki Churna*. Effect of these intervention assessed through subjective and objective parameters. **Result & Conclusion:** Both groups shown highly statistical significant with $P < 0.001$ for the objective parameters. When we compare both groups, it shown that

there is statistical significant difference between *Saptachakra churna* and *Amalaki churna* in *Madhumeha* w.s.r. type 2 Diabetes Mellitus.

KEYWORDS: Diabetes mellitus, Madhumeha, Saptachakra churna, Amalaki Churna and Beta-sitosterol.

INTRODUCTION

Prameha is one among *Ashta Mahagadas*.^[1] It is kapha pradhana *tri doshajavyadhi* caused by vitiation of *Medha*.

Madhumeha is one among *Kapha pradhana tri doshaja vyadhi*, it also referred as *Prameha*. Indulging with nidan which aggravated *doshas* specially *kapha dosha* and then vitiated *tri dosha* vitiates *medas* and other *dhatu*s including *ojas*. *Madhumeha* is *kapha pradhan tri doshaja* thus vitiates other components of body i.e. *Rasa, Rakta, Mamsa, Meda, Majja, Shukra, Lasika, Vasa, Kleda* and *Ojas*. Vitiated *Dosha* and *Dushyas* further vitiates *Mutravaha srotas* then goes to *Basti* and manifest *Madhumeha*.^[2]

As per pathophysiology, *Madhumeha* divided into 2 types i.e. *Dhatukshayajanya* and *Avarnjanya*. *Dhatukshayajanya* is *asadhya* and *avaranjanya* is *kashta sadhya*.^[3]

In Ayurveda treatment of *Madhumeha* been includes *Shodana* and *Shamanoushadi*, *Shodana* has to be adopted according to *Rogi-Roga Bala*, *swedana* is contraindicated in *Madhumeha*, hence *Shamnoushadis* line of treatment are widely into practice.^[4]

This *Madhumeha* is correlates with the Diabetes Mellitus in modern science, Diabetes is the metabolic disorder associated with hyperglycemia. If not controlled in time leads to end stage renal disease.^[4] Statistical wise Diabetes mellitus risen dramatically over the past 2 decades, from an estimated cases in 30 million 1985 to 415million in 2017. Based on current trends, the IDF projects that 642 million will have diabetes by the year 2040. In 2015, the prevalence of diabetes in individuals from age 20-79years ranged from 7.2% to 11.4%. India is 2nd country with highest number of diabetes patients. Upto 80% of diabetic individuals live in low income or medium income countries. India is expected to be the 'World Diabetes capital' because india has genetic predisposition to develop Diabetes mellitus which is further precipitated by life style.^[5]

Many forms of *Shamanoushadis* been explained in treatment of *Madhumeha* i.e. *Vati*,

Choorna, Kashaya, Asava and arishta etc. The present study is of *eka moolika prayoga* and focusses on the efficacy of two *choornas* i.e. *Amalaki choorna* and *Saptachakra Choorna* in *Madhumeha*.

Aim of study

To assess efficacy of *Saptachakra churna* in the management of *Madhumeh* / Type 2 DM.

Objectives of study

To evaluate the efficacy of *Saptachakra churna* and *Amalaki churna* in the management of *Madhumeha* / Type 2 DM.

To compare the efficacy of *Saptachakra churna* and *Amalaki churna* in the management of *Madhumeha* / Type 2 DM.

MATERIALS AND METHODS

Source of data

a) Literary source

All available *Ayurvedic*, Modern medical literatures, Contemporary texts including journals and websites about the disease and medicine were reviewed and documented for the study.

b) Drug source

Drugs required for preparation of *Saptachakra Churna* & *Amalaki Churna* were identified and collected from the source of availability and the medicines were prepared according to the classical references at Alva's Pharmacy, Mijar.

c) Sample source

Patients diagnosed with *Madhumeha* were randomly selected and allocated into 2 groups from; Kayachikitsa Out Patient Department and In Patient Department of Alva's Ayurveda Medical College and Hospital, Moodbidri.

Medical Camps and Other referrals.

Method of collection of data

A case proforma was prepared with details of history-taking, physical examination, investigations and analyzed statistically.

Selection of patients

Selection of patients were done irrespective of gender, religion, occupation, marital status, socio-economic status and educational status. Those fulfilling the diagnostic criteria, inclusion and exclusion criteria were selected.

- a) **Sample Size and Grouping:** 60 patients were randomly divided into 2 groups A and B comprising 30 patients in each Group.
- b) **Allocation:** Random allocation
- c) **Study design:** Parallel group comparative clinical study.
- d) **Blinding:** Single blind.
- e) **Method of sampling:** Lottery method.

Diagnostic criteria

- Fasting Blood Sugar range between 126 - 250mg/dL and Post Prandial Blood Sugar range between 200 – 350 mg/dL with or without signs & symptoms of Diabetes mellitus.

Inclusion criteria

- Patients age between 20 – 70 years of both genders fulfilling diagnostic criteria of Madhumeha / Type 2 Diabetes Mellitus were selected for the study.
- Patients with FBS 126 – 250 mg/dL & PPBS 200 – 350 mg/dL of Type-2 Diabetes Mellitus were selected for the study.
- Patients willing to participate in the study and sign informed consent form.

Exclusion criteria

- Patient with High blood glucose levels FBS >250 mg/dL & PPBS > 350 mg/dL.
- Patients with complications like DKA, HHS, Diabetic Gangrene & Carbuncles.
- Gestational diabetes, Patients on insulin with Type 2 DM.
- Diabetes with other Endocrine disorders are excluded from the study.
- Patients suffering from other systemic diseases which may interfere with study are excluded.

Intervention

Table no. 1	Group A	Group B
Sample size	30 patients	30 patients
Intervention	<i>Saptachakra Churna</i>	<i>Amalaki Churna</i>
Dose	5g/day	5g/day
Anupana	<i>Ushnodaka</i>	<i>Ushnodaka</i>
Time	Before food	Before food
Duration	30 days	30 days

Observation period

Patient will be assessed before treatment i.e Day 0, on 11th day, 21th day during treatment and 31st day after completion of treatment and response of the patient's condition is recorded with specially designed performa which includes Patient's Profile, Detail History, Physical Examinations and Laboratory Investigations.

Assessment criteria**Subjective**

- Prabhuta avila mutra / Poly Uria
- Ati Kshudha / Poly Phagia
- Ati Trusha / Poly Dipsia
- Ati Sveda / Perspiration

Objective

- Fasting Blood Sugar (FBS)
- Post Prandial Blood Sugar (PPBS)

Laboratory investigation

- Fasting Blood Sugar (FBS)
- Post Prandial Blood Sugar (PPBS)

Method of Statistical Analysis

Statistical tool used here is Sigma Stat Version 4.0, comparative analysis of the overall effect of the treatment in both the groups was done statistically with Mann Whitney U Rank Sum Test. Within the group comparison was done statistically with 'Repeated measures of analysis of variance' (RM ANOVA) test followed by 'post hoc - Tukey test'.

RESULTS

Statistical analysis of effect of *Saptachakra choorna* and *Amalaki choorna* after 11th, 21st and 31st of treatment period is hereby calculated using applicable statistic tests.

1. Effect of *saptachakra choorna* on symptoms

Saptachakra choorna shows statistical significant result in *Prabhuta mutrata* with P value ($P < 0.05$), *Karapada daha* with P value ($P < 0.05$) and *Dourbalya* with P value ($P < 0.05$). Its statistically insignificant in *Ati kshuda* and *Ati sweda* with P value ($P > 0.05$).

2. Effect of *amalaki choorna* on symptoms

Amalaki choorna shows statistical significant result in *Dourbalya* with P value ($P < 0.05$) and. Its statistically insignificant in *Prabhuta mutrata*, *Karapada daha*, *Ati kshuda* and *Ati sweda* with P value ($P > 0.05$).

3. Comparrison between two groups in symptoms

In comparision between both groups among symptoms Dourbalya BT shown statistical significant result with P value ($P < 0.05$) and same symptom AT is statistically insignificant with P value ($P > 0.05$). Remaining symptoms shown statistically insignificant result in both before and after treatment.

4. Comparrison of fbs in between two groups among normalBMI (<25)

In normal BMI patients when compared both groups on FBS shows statistically insignificant result with P ($P > 0.05$) value.

5. Comparrison of ppbs in between two groups among normalBMI (<25)

In normal BMI patients when compared both groups on PPBS shows statistically insignificant result with P ($P > 0.05$) value during treatment and after treatment.

6. Comparrison of fbs in between two groups among overweight BMI (>25)

In over weight BMI patients when compared both groups on FBS shows statistically significant result with P ($P < 0.05$) value during treatment on 21st day and 31st day and statistically insignificant on 11th day with P value ($P > 0.05$).

7. Comparrison of ppbs in between two groups among overweight BMI (>25)

In over weight BMI patients when compared both groups on PPBS shows statistically insignificant result with P ($P > 0.05$) value during treatment on 11th day, 21st day and 31st day.

8. Effect of *saptachakra choorna* on FBS

There is highly statistical significant difference seen in group A on FBS with P value ($P < 0.001$) when compared before treatment and during treatment on 11th, 21st and 31st day. And also shown highly significant result of FBS when compared to 11th & 21st day and 11th & 31st day. When compared to 21st & 31st day treatment shows no statistical significance with P value ($P > 0.05$).

9. Effect of *amalaki choorna* on FBS

There is highly statistical significant difference seen in group B on FBS with P value ($P < 0.001$) when compared before treatment and during treatment on 11th, 21st and 31st day. And also shown highly significant result of FBS when compared to 11th & 21st day and 11th & 31st day. When compared to 21st & 31st day treatment shows no statistical significance with P value ($P > 0.05$).

10. Effect of *saptachakra choorna* on PPBS

There is highly statistical significant difference seen in group A on PPBS with P value ($P < 0.001$) when compared before treatment and during treatment on 11th, 21st and 31st day. And also shown highly significant result of FBS when compared to 11th & 21st day and 11th & 31st day. When compared to 21st & 31st day treatment shows statistical significance with P value ($P < 0.05$).

11. Effect of *amalaki choorna* on PPBS

There is highly statistical significant difference seen in group B on PPBS with P value ($P < 0.001$) when compared before treatment and during treatment on 11th, 21st and 31st day. And also shown highly significant result of FBS when compared to 11th & 21st day and 11th & 31st day. When compared to 21st & 31st day treatment shows no statistical significance with P value ($P > 0.05$).

12. Comparison of FBS in between Group A and Group B

There is statistical significant difference seen when both groups compared on FBS in 11th day and 31st day with P value ($P < 0.05$). And no significant result seen in 21st day. There is no statistical significant result seen during treatment on 11th -21st, 11th -31st, and 21st -31st day with P value ($P > 0.05$).

13. Comparison of PPBS in between Group A and Group B

There is statistical significant difference seen when both groups compared on FBS in 11th day, 21st day and 31st day with P value ($P < 0.05$). There is no statistical significant result seen during treatment on 11th -21st, 11th -31st, and 21st -31st day with P value ($P > 0.05$).

DISCUSSION

Discussion on selection of the disease *madhumeha*

The disease *Prameha* has been described almost all the *Acharyas* and it is *Anushangi* mentioned by *Acharya Charaka*, which means a disease is chronic and remains attached forever with affected person. *Acharya Sushruta* included *Prameha* under *Ashtamahagada*. The difficulty in treatment of *Prameha* is involvement of *Tridoshas* and *Dushyas*, as most of them are contradictory in nature. *Madhumeha* is *Krichra Sadhya* i.e. disease difficult to cure, and becomes *Asadhya Vyadhi*.

Diabetes mellitus is non-communicable long term metabolic disorder with multiple causative factors, variable clinical manifestations and number of complications. The global burden due to Diabetes is mostly contributed by Type 2 diabetes which constitutes 80% to 95% of the total diabetic population. If not controlled in time leads to end stage renal disease. Statistical wise Diabetes mellitus risen dramatically over the past 2 decades, from an estimated cases in 30 million 1985 to 415 million in 2017. Based on current trends, the IDF projects that 642 million will have diabetes by the year 2040. In 2015, the prevalence of diabetes in individuals from age 20-79 years ranged from 7.2% to 11.4%. Up to 80% of diabetic individuals live in low income or medium income countries. India is expected to be the 'World Diabetes capital' because India has genetic predisposition to develop Diabetes mellitus which is further precipitated by life style.

In spite of newer discoveries in the field of medicine both modern physicians as well as Ayurveda physicians are facing a challenge to bring glycemic control, for the successful management of the disease without any adverse effect, to detain the further progression of the disease and to arrest the complications. This disease has become a matter of concern which demands more studies and researches in this regard. Knowing the importance and the severity of the condition, there are many research works that are undertaken for the management of Diabetes, but there is no reverting it but managing through medications. So, it is priority area of research in *Ayurveda* to come up with promising results in disease. When we consider the treatment modalities which can be adopted, *Santarpana*, *Samshodhana* and *Samshamana*

measures have been explained in *Ayurveda* for the management of *Madhumeha* depending up on the *Roga* and *Rogi bala*. *Samshamanaoushadis* plays vital major role in treatment as *Samshodhana* has cost factor and strain to body and *swedana* is contraindicated in *Madhumeha*, hence *Shamnoushadis* line of treatment are widely into practice.

Many forms of *Shamanoushadis* been explained in treatment of *Madhumeha* i.e. *Vati*, *Choorna*, *Kashaya*, *Asava* and *arishta* etc. The present study is of *eka moolika prayoga* and focusses on the efficacy of two *choornas* i.e. *Amalaki choorna* and *Saptachakra Choorna* in *Madhumeha*.

2. Discussion on Materials and Methods

In the current study, *Amalaki choorna* has been selected as standard control whereas *Saptachakra choorna* as the trail drug. As no research work has been conducted on *Saptachakra* in the management of *Madhumeha* in *Ayurveda* so far, it is taken to evaluate efficacy of this drug in *Madhumeha* and compare its efficacy with that of *Amalaki*. A comparative study is opted in this regard.

In current study 57 patients are included and clinical parameters like FBS and PPBS were considered for diagnosis, previously diagnosis which are not on treatment of alternative stream also taken for studies. Inclusion range for study of FBS is 126-250 mg/ dL and PPBS is 200-350 mg / dL.

Apart from above mentioned other inclusion and exclusion criteria are also considered which discussed further in study. Randomised clinical comparative study with before, during and after treatment test was designed and patient were divided into 2 groups 30 each. In Group A 29 patients given with *Saptachakra choorna* before food twice a day along with luke warm water. In Group B 28 patients given with *Amalaki choorna* before food twice a day along with luke warm water.

3. Discussion on probable mode of action of drugs

1. *Saptachakra choorna*

Madhumeha is a *Kapha-vata pradhana Tridoshaja*, *Vyadhi*, *Saptachakra* has *Kapha-vatahara* action. It has *Tikta* and *Kashaya Rasa Pradhana* and *Laghu*, *Ruksha Gunas* which reduces *Kapha dosha* hence reduces *Kledata*. Obstruction of *Vata* by *Kapha* and *Medas* occurs in the *Samprapti* as *Kapha* is the *Aarambhaka Dosha* and *Vata* is *Preraka Dosha*. *Laghu* and

Ruksha guna by virtue of their *Kaphaghna* and *Medoghna prabhava* help in reducing tissue weight.

Saptachakra Choorna has active ingredient name beta-sitosterol which hepato- tonic, lipid lowering action and anti-diabetic effect. It also has leucopelargonidin which hypoglycemic, hypolipidemic and serum insulin rising effect.

2. *Amalaki choorna*

Amalaki has *Laghu & Ruksha Gunas* which helps in alleviation of *Bahudrava Shleshma & Abaddha Medas* thus acts on *Madhumeha*. On *karmukta* it acts as Anti-diabetic, Anti-oxidant and Diuretics. It also a *Rasayana* and enhances *Ojas* which mitigates all diseases.

Amalaki has Vit C in abundantly which acts as anti-oxidant and protects from free radicals damage. It also reduces blood glucose level and reduces lipid levels as well.

4. Discussion on results of clinical study

1. Effect on symptoms

Saptachakra Choorna Showing Statistical significant result on *Prabhuta mutrata* after 30 days of treatment with $P < 0.05$ this is because drug has *Tikta & Kashaya rasa pradhana* and *Katu Vipaka* which is reduces *Kapha* which is responsible for causing *Kledata* in body further leading to *Prabhuta mootrata*. This drug also shown significant result on *Karapada daha* which is because of *Pitta dosha* with $P < 0.05$. As this drug have *tikta & Kahsya rasa* which reduces *Pitta* thus relived *Karapada daha*. Both drugs shown significant result on *Dourbalya* symptoms after 30 days of treatment with $P < 0.05$ this effect seen because both drugs have *Deepana & Rasayana* properties.

2. Effect on fasting blood Sugar and Post prandial blood sugar

Both the drugs shown highly significant result on FBS and PPBS with $P < 0.001$ after 30 days of treatment. When compared between 2 groups mean difference *Saptachakra choorna* shown more reduction in FBS and PPBS values comparatively. This is because of presence of active ingredient name beta-sitosterol which hepato-tonic, lipid lowering action and anti-diabetic effect. Study on rats shown Beta-sitosterol reduces insulin resistance and may helps in insulin secretion. It also has leucopelargonidin which hypoglycemic, hypolipidemic and serum insulin rising effect.

When both groups compared on basis of FBS and PPBS, Both group slightly better in

reducing PPBS compared to FBS, This may be because of the improvement in the insulin mediated suppression of hepatic gluconeogenesis and also the main ingredients.

CONCLUSION

The current study was carried out giving importance to literary and clinical considering the ancient as well as contemporary views of disease. The following study conclusion is drawn after considering the results of intervention and review of literature.

- In literature its mentioned that major etiological factors are *Kapha*, *Meda Vardhaka Ahara and Vihara*. The observations found in the study are concordant to this description. Tendency towards sedentary life style and faulty dietary habits leads to vitiation of *Kapha* and *Meda* leading to *Madhumeha*.
- In etiopathogenesis of diabetes mellitus hereditary also given importance, this study discloses the concept of family history one of cause for manifestation of disease.
- *Apathyanimittaja* one of type of *Madhumeha* this also observed in in current study *Ahara*, *Avyayama* etc.
- *Saptachakra* has *Kapha-vatahara* action. It has *Tikta* and *Kashaya Rasa Pradhana* and *Laghu*, *Ruksha Gunas & Katu Vipaka* which reduces *Kapha dosha & Medha* further reduces *Kledata*. Hence reduces *Madhumeha*.
- *Amalaki* has *Laghu & Ruksha Gunas* which helps in alleviation of *Bahudrava Shleshma & Abaddha Medas* thus acts on *Madhumeha*. It is also *Oja Vardhaka* hence acts on disease.
- Both drugs shown insignificant result in reduction of symptoms like, *Atikshuda*, *Ati sweda*, *Karapada daha*.
- *Saptachakra choorna* also shown significant result on *Prabhuta mutrata & Dourbalya*. Where as *Amalaki* shows significant result only in *Dourbalya*.
- *Saptachakra choorna* shown more reduction in FBS and PPBS values comparatively *Amalaki choorna*. This is because of presence of active ingredient name beta-sitosterol which hepato-tonic, lipid lowering action and anti-diabetic effect. It also has leucopelargonidin which hypoglycemic, hypolipidemic and serum insulin rising effect.
- *Saptachakra choorna* shown significant result in over weight BMI patients comparatively patients with normal BMI.
- Both drugs shown highly significant result in reduction of FBS & PPBS values.

General observation**1. According to Gender: Table No. 2.**

Gender	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Male	21	70.00	17	56.66	38	63.33
Female	9	30.00	13	43.34	22	36.67

2. According to Age: Table No. 3.

Age	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
31-40	9	30.00	6	20.00	15	25.00
41-50	9	30.00	15	50.00	24	40.00
51-60	12	40.00	9	30.00	21	35.00

3. According to Religion: Table No. 4.

Religion	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Hindhu	22	73.33	23	76.66	45	75.00
Muslim	5	16.66	5	16.66	10	16.66
Christian	3	10.00	2	6.66	5	8.34

4. According to Occupation: Table No. 5.

Occupation	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Business	13	43.33	11	36.66	24	40.00
Job	6	20.00	8	26.66	14	23.33
Housewife	6	20.00	9	30.00	15	25.00
Teacher	4	13.33	1	3.33	5	8.33
Driver	1	3.33	1	3.33	2	3.33

5. According to Domicile: Table No. 6.

Domicile	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Urban	20	66.67	17	56.67	37	61.67
Rural	10	33.33	13	43.33	23	38.33

6. According to Diet: Table No. 7.

Diet	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Mixed	23	76.67	26	86.67	49	81.67
Veg	7	23.33	4	13.33	11	18.33

7. According to Habits: Table No. 8.

Habits	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Tea	15	50.00	16	53.34	31	51.67
Smoking	10	33.33	4	13.33	14	23.33
Alcohol	5	16.66	6	20.00	11	18.33
Coffee	1	3.33	1	3.33	2	3.33
No	3	10.00	5	16.67	8	13.33

8. According to family History: Table No. 9.

F/H	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Yes	11	36.67	10	33.33	21	35.00
No	19	63.33	20	66.67	39	65.00

9. According to nature of Work: Table No. 10.

Nature of work	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Sedentary	18	60.00	19	63.33	37	61.67
Standing	9	30.00	7	23.33	16	26.66
Travelling	3	10.00	4	13.33	7	11.66

10. According to Sleep: Table No. 11.

Sleep	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Disturbed	13	43.33	10	33.33	23	38.33
Sound	17	56.67	20	66.67	37	61.67

11. According to Exercise: Table No. 12.

Exercise	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Regular	3	10.00	1	3.33	4	6.66
Irregular	4	13.33	3	10.00	7	11.66
No	23	76.67	26	86.67	49	81.67

12. According to Ahara: Table No. 13.

Ahara	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Madhura	25	83.33	24	80.00	49	81.66
Guru	9	30.00	7	23.33	16	26.66
Snigdha	3	10.00	2	6.66	5	8.33
Abhishyanda	21	70.00	20	66.67	41	68.33

13. According to BMI: Table No. 14.

BMI	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Over weight	22	73.33	24	80.00	46	76.66
Normal	8	26.66	6	20.00	14	23.34

14. According to Prakruti: Table No. 15.

Prakruti	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
VP	10	33.33	15	50.00	25	41.67
VK	18	60.00	13	43.33	31	51.66
KP	2	6.67	2	6.67	4	6.67

15. According to symptom Prabhuta Mutrata: Table No. 16.

Prabhuta mutrata	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Yes	13	43.33	11	36.66	24	40.00
No	17	56.67	19	63.67	36	60.00

16. According to Atikshuda: Table No. 17.

Ati kshudha	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Yes	6	20.00	4	13.33	10	16.67
No	24	80.00	26	86.67	50	83.33

17. According to Ati sweda: Table No. 18.

Ati swedha	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Yes	4	13.33	4	13.33	8	13.33
No	26	86.67	26	86.67	52	86.67

18. According to Karapada daha: Table No. 19.

Kara pada daha	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Yes	12	40.00	8	26.67	20	33.33
No	18	60.00	22	73.33	40	66.67

19. According to Dourbalya: Table No. 20.

Dourbalya	Group A		Group B		Total	
	Number of Subjects	%	Number of Subjects	%	Number of Subjects	%
Yes	17	56.67	16	53.33	33	55.00
No	13	43.33	14	46.67	27	45.00

RESULTS**20. Effect of *saptachakra choorna* on symptoms****Table No. 21.**

			Median	T value	P value	Remarks
Group A	Prabhuta mutrata	BT	0.000	21.000	= 0.031	S
		AT	0.000			
	Ati kshuda	BT	0.000	7.500	= 0.375	NS
		AT	0.000			
	Ati sweda	BT	0.000	0.000	=1.000	NS
		AT	0.000			
	Karapadadaha	BT	0.000	36.000	=0.008	S
		AT	0.000			
	Dourbalya	BT	1.000	55.000	=0.002	S
		AT	0.000			

21. Effect of *amalaki choorna* on symptoms**Table No. 22.**

			Median	T value	P value	Remarks
Group B	Prabhuta mutrata	BT	0.000	10.000	= 0.125	NS
		AT	0.000			
	Ati kshuda	BT	0.000	1.000	= 1.000	NS
		AT	0.000			
	Ati sweda	BT	1.000	1.000	=1.000	NS
		AT	1.000			
	Karapada daha	BT	1.000	6.000	= 0.250	NS
		AT	1.000			
	Dourbalya	BT	0.500	36.000	=0.008	S
		AT	0.000			

22. Comparrison between two groups in symptoms

Table No. 23.

			Median	T value	P value	Remarks
Prabhuta mutrata	BT	Group A	0.000	731.500	= 0.200	NS
		Group B	0.000			
	AT	Group A	0.000	815.500	= 0.962	NS
		Group B	0.000			
Ati kshuda	BT	Group A	0.000	771.500	=0.521	NS
		Group B	0.000			
	AT	Group A	0.000	799.500	= 0.847	NS
		Group B	0.000			
Ati sweda	BT	Group A	0.000	799.500	= 0.847	NS
		Group B	0.000			
	AT	Group A	0.000	799.500	= 0.847	NS
		Group B	0.000			
Karapada daha	BT	Group A	0.000	716.500	= 0.128	NS
		Group B	0.000			
	AT	Group A	0.000	828.500	= 0.797	NS
		Group B	0.000			
Dourbalya	BT	Group A	1.000	661.000	= 0.016	S
		Group B	0.000			
	AT	Group A	0.000	801.000	= 0.866	NS
		Group B	0.000			

23. Comparrison of fbs in between two groups among normal BMI(<25)

Table No. 24.

			Mean	S.D	S.E	T value	P value	Remarks
FBS BMI <25(N)		Group A	157.375	22.148	7.831	0.447	P = 0.663	NS
		Group B	152.333	18.938	7.732			
	11 th day	Group A	137.125	17.398	6.151	-0.0587	P = 0.954	NS
		Group B	137.667	16.609	6.781			
	21 st day	Group A	132.250	14.936	5.281	0.0455	P = 0.964	NS
		Group B	131.833	19.436	7.935			
	31 st day	Group A	129.625	11.160	3.946	-0.657	P = 0.523	NS
		Group B	134.667	17.603	7.186			

24. Comparrison of ppbs in between two groups among normal BMI(<25)

Table No. 25.

			Mean	S.D	S.E	T value	P value	Remarks
PPBS BMI <25(N)	BT	Group A	241.500	26.038	9.206	-0.055	P = 0.957	NS
		Group B	242.333	30.131	12.301			
	11 th day	Group A	203.250	21.245	7.511	-0.594	P = 0.564	NS
		Group B	211.500	30.918	12.622			
	21 st	Group A	194.750	14.340	5.070	-0.629	P = 0.541	NS
		Group B	200.667	20.963	8.558			

	day							
	31 st	Group A	189.750	15.285	5.404	-1.048	P = 0.315	NS
	day	Group B	201.667	27.142	11.081			

25. Comparrison of fbs in between two groups among over weightBMI (>25)

Table No. 26.

			Mean	S.D	S.E	T value	P value	Remarks
	BT	Group A	166.238	15.355	3.351	2.892	P = 0.006	S
		Group B	154.545	10.875	2.319			
FBS	11 th	Group A	141.429	14.365	3.135	1.876	P = 0.068	NS
BMI	day	Group B	134.318	10.232	2.182			
> 25	21 st	Group A	136.667	12.765	2.785	2.062	P = 0.046	S
(OW)	day	Group B	129.682	9.245	1.971			
	31 st	Group A	135.000	10.982	2.396	2.033	P = 0.049	S
	day	Group B	128.864	8.730	1.861			

26. Comparrison of ppbs in between two groups among over weightBMI (>25)

Table No. 27.

			Mean	S.D	S.E	T value	P value	Remarks
	BT	Group A	267.238	31.857	6.952	2.501	P = 0.016	S
		Group B	247.091	19.880	4.239			
PPBS	11 th	Group A	228.905	30.853	6.733	1.944	P = 0.059	NS
BMI	day	Group B	213.045	22.137	4.720			
> 25	21 st	Group A	215.857	29.104	6.351	1.473	P = 0.148	NS
(OW)	day	Group B	204.773	19.532	4.164			
	31 st	Group A	213.619	27.667	6.037	1.349	P = 0.185	NS
	day	Group B	203.455	21.478	4.579			

27. Effect of *saptachakra choorna* on FBS

Table No. 28.

		Mean	S.D	S.E	T	p	Remarks
		difference			value	value	
	BT -	23.552	8.149	1.513	15.565	<0.001	HS
	11 th						
	BT -	28.345	8.735	1.622	17.474	<0.001	HS
	21 st						
Group	11 th -	4.793	4.279	0.795	6.032	<0.001	HS
A FBS	21 st						
	day						
	11 th -	6.724	8.387	1.558	4.317	<0.001	HS
	31 st						

	day						
	21 st – 31 st	1.931	6.199	1.151	1.678	= 0.105	NS
	day						
	BT –	30.276	11.774	2.186	13.847	<0.001	HS
	(AT)						
	31 st						

28. Effect of *amalaki choorna* on FBS

Table No. 29.

		Mean difference	S.D	S.E	T value	P value	Remarks
FBS GroupB	BT – 11 th day	19.036	8.239	1.557	= 12.225	<0.001	HS
	BT – 21 st day	23.929	9.022	1.705	= 14.034	<0.001)	HS
	11 th – 21 st day	4.893	3.765	0.711	= 6.877	<0.001	HS
	11 th – 31 st day	4.929	4.853	0.917	= 5.374	<0.001	HS
	21 st – 31 st day	0.0357	5.507	1.041	= 0.0343	= 0.973	NS
	BT – 31 st day	23.964	9.762	1.845	12.990	<0.001	HS

29. Effect of *saptachakra choorna* on PPBS

Table No. 30.

		Mean difference	S.D	S.E	T value	p value	Remarks
Group APPBS	BT – 11 th day	38.310	8.751	1.625	= 23.575	<0.001	HS
	BT – 21 st day	50.103	14.840	2.756	18.181	<0.001	HS
	11 th – 21 st day	11.793	11.742	2.181	5.408	<0.001	HS
	11 th – 31 st day	14.793	14.497	2.692	= 5.495	<0.001	HS
	21 st – 31 st day	3.000	7.901	1.467	= 2.045	= 0.050	S
	BT – 31 st day	53.103	17.141	3.183	16.684	<0.001	HS

30. Effect of amalaki choorna on PPBS**Table No. 31.**

		Mean difference	S.D	S.E	T value	p value	Remarks
Group B PPBS	BT – 11 th day	33.250	9.921	1.875	= 17.735	<0.001	HS
	BT – 21 st day	42.179	10.767	2.035	= 20.729	<0.001	HS
	11 th – 21 st day	8.929	12.424	2.348	= 3.803	<0.001	HS
	11 th –31 st day	9.750	11.051	2.088	= 4.669	<0.001	HS
	21 st –31 st day	0.821	8.546	1.615	= 0.509	= 0.615	NS
	BT – 31 st day	43.000	11.537	2.180	= 19.722	<0.001	HS

31. Comparison of FBS in between Group A and Group B**Table No. 32.**

	FBS	Mean difference	S.D	S.E	t value	P value	Remarks
BT-11 th day	Group A	4.516	8.149	1.513	2.080	= 0.042	S
	Group B		8.239	1.557			
BT-21 th day	Group A	4.416	8.735	1.622	1.878	= 0.066	NS
	Group B		9.022	1.705			
BT-31 th day	Group A	6.312	11.774	2.186	2.199	0.032	S
	Group B		9.762	1.845			
11 th – 21 st day	Group A	0.1	4.279	0.795	0.0933	= 0.926	NS
	Group B		3.765	0.711			
11 th – 31 st day	Group A	1.795	8.387	1.558	0.985	= 0.329	NS
	Group B		4.853	0.917			
21 th – 31 st day	Group A	1.895	6.199	1.151	1.219	= 0.228	NS
	Group B		5.507	1.041			

32. Comparison of PPBS in between Group A and Group B**Table No. 33.**

	PPBS	Mean difference	S.D	S.E	T value	P value	Remarks
BT-11 th day	Group A	5.068	8.751	1.625	2.044	= 0.046	S
	Group B		9.921	1.875			
BT-21 th day	Group A	8.639	14.840	2.756	2.553	= 0.013	S
	Group B		10.189	1.926			
BT-31 th day	Group A	10.103	17.141	3.183	2.601	= 0.012	S
	Group B		11.537	2.180			
11 th – 21 st	Group A	3.579	11.742	2.181	1.183	= 0.242	NS

day	Group B		11.073	2.093			
11 th – 31 st	Group A	5.043	14.497	2.692	1.473	= 0.146	NS
day	Group B		11.051	2.088			
21 th – 31 st	Group A	1.464	7.901	1.467	0.700	= 0.487	NS
day	Group B		7.900	1.493			

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