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"COMPARATIVE EFFICACY OF *MANJISTHA CHURNA* AS *PHANT* AND *BHUMYAMLAKI CHURNA* IN THE MANAGEMENT OF FATTY LIVER DISEASE: AN AYURVEDIC PERSPECTIVE"

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Abstract

Objective: This study aimed to evaluate and compare the efficacy of two Ayurvedic drugs, ***Manjistha Churna* as *Phant*** and ***Bhumyamlaki Churna***, in managing fatty liver disease (*Medagni-Mandya janya Medodushti*).

Methods: A total of 60 patients diagnosed with fatty liver disease (Grade I–III) were enrolled and randomly assigned into two groups: Group A (*Manjistha Churna* as *Phant*, 10 g/day, orally for 45 days) and Group B (*Bhumyamlaki Churna*, 5 g twice daily, orally for 45 days). The main assessment parameter included changes in liver fat content evaluated by abdominal ultrasonography (USG) and improvements in clinical symptoms such as hyperacidity, flatulence, heaviness in the abdomen, constipation, anorexia, and abdominal pain. Statistical analyses were performed using the Wilcoxon matched-pairs signed-ranks test and paired t-tests.

Results: Both groups demonstrated statistically significant improvements in USG scores, with reductions in fatty liver grades (Group A: mean difference 0.7333, $p < 0.0001$; Group B: mean difference 0.7667, $p < 0.0001$). Symptom relief was observed across all parameters in both groups, with hyperacidity showing notable improvement (Group A: 70.09% relief, Group B: 77.22% relief). Group A exhibited slightly better symptom control in hyperacidity and heaviness in the abdomen, while Group B showed marginally superior outcomes in reducing anorexia and fat content. However, intergroup comparisons revealed no statistically significant differences in overall efficacy ($p > 0.05$).

Conclusion: Both *Manjistha Churna* as *Phant* and *Bhumyamlaki Churna* are effective in managing fatty liver disease, offering significant reductions in symptoms and liver fat grades. While their efficacy profiles are comparable, specific symptom-oriented benefits may guide tailored therapeutic approaches.

Keywords: Fatty Liver Disease, *Manjistha Churna*, *Bhumyamlaki Churna*

Introduction

Fatty Liver Disease (FLD), a prevalent and increasingly significant health concern, is characterized by the abnormal accumulation of fat in the liver. It is broadly classified into two types: Non-alcoholic Fatty Liver Disease (NAFLD) and Alcoholic Fatty Liver Disease (AFLD). NAFLD is closely linked to metabolic disorders such as obesity and insulin resistance, affecting approximately

25% of the global population. AFLD, on the other hand, is a direct consequence of chronic alcohol abuse, contributing significantly to liver-related mortality worldwide. Both conditions, if untreated, can progress to severe complications like cirrhosis and hepatocellular carcinoma. Despite its silent progression in early stages, FLD poses systemic risks, including cardiovascular disease, diabetes, and metabolic syndrome, underscoring the urgency for effective therapeutic interventions.

Currently, there are no FDA-approved pharmacological treatments for NAFLD or AFLD. Management primarily relies on lifestyle modifications, which include weight reduction, dietary adjustments, and increased physical activity. However, the complexity of these conditions, often accompanied by co-morbidities, necessitates alternative therapeutic strategies. Ayurvedic medicine offers promising options, emphasizing the use of hepatoprotective and fat-reducing herbal formulations. Two such herbal drugs, ***Manjistha* (*Rubia cordifolia*)** and ***Bhumyamlaki (Phyllanthus niruri)***, have garnered attention for their potential efficacy in managing fatty liver disease.

Manjistha, renowned for its blood-purifying (*Raktashodhaka*) and anti-inflammatory properties, is effective in detoxifying the liver, reducing fat accumulation, and balancing *Kapha* and *Pitta doshas*. Its preparation as a ***Phant*** (herbal decoction) ensures enhanced bioavailability of active compounds, promoting optimal therapeutic effects. *Bhumyamlaki*, known for its hepatoprotective and antioxidant properties, supports liver detoxification, regulates fat metabolism, and mitigates oxidative stress, making it a versatile agent in managing liver-related disorders.

In Ayurveda, this condition aligns with *Medoagni Mandya Janya Medodushti* and is attributed to the hypofunction of *Jatharagn*i and *Medodhatwagni*, leading to the excessive production of *Meda* (unprocessed fat tissue). The *Sneha Guna* (unctuous property) in the liver increases due to the accumulation of *Meda* (fat tissue), as both *Pitta* (present in liver) and *Meda* share the *Sneha* characteristic. This state can precede the development of fatty liver disorder.

Need for the Trial:

While both *Manjistha* and *Bhumyamlaki* have shown promise in managing liver disorders, a comparative evaluation of their efficacy specifically in fatty liver disease remains unexplored. Given the rising burden of FLD and the absence of conclusive evidence favoring one formulation over the other, this trial was designed to address the gap. Assessing these herbal formulations through a structured clinical study offers insights into their therapeutic potential, guiding evidence-based integration into modern healthcare approaches.

Research question: Is there any difference between the efficacy of *Manjistha churna* as *phant* and *Bhumyamlaki churna* for the management of fatty liver disease?

Aim - Studied the comparative efficacy of *Manjistha churna* as *phant* and *Bhumyamlaki churna* formanaging the *Medagni-Mandya janya Medodushti* (fatty liver disease).

Objectives-

Primary objective:

- Compared the efficacy of *Manjistha churna* as *phant* and *Bhumyamlaki churna* for managing the *Medagni-Mandya janya Medodushti* (fatty liver disease).

Secondary objective:

- Efficacy of *Manjistha churana* as a *phant* was analysed.
- Efficacy of *Bhumyamlaki churna* was analysed
- The change in fat content of liver by USG abdomen screening was done.

Methodology:

This was a randomized, parallel-group clinical trial. The study included 60 participants who met the inclusion criteria and were willing to provide informed consent. Patients were randomly assigned into two groups (Group A and Group B) with 30 patients each. The trial duration was 45 days.

Intervention

- **Group A**: Received *Manjistha Churna* as *Phant* (10 g/day), administered orally on an empty stomach.
- Group B: Received *Bhumyamlaki Churna* (5 g twice daily), administered orally with lukewarm water.

Outcome Measures

The Primary Outcome that is reduction in liver fat content was assessed by ultrasonography (USG). The Secondary Outcomes were Improvement in clinical symptoms such as Hyperacidity, Flatulence, Heaviness in the abdomen, Constipation, Anorexia, Abdominal pain.

Assessment and Statistical Analysis

- Clinical symptoms were scored based on severity, and changes before and after treatment were statistically analyzed.
- Ultrasonography findings were compared pre- and post-treatment.
- Statistical tools such as the Wilcoxon matched-pairs signed-ranks test and paired t-tests were used for intragroup comparisons, while Mann-Whitney U tests were employed for intergroup comparisons.

The inclusion criteria for the study required patients aged 18–70 years with ultrasonography-confirmed fatty liver disease (Grade I–III), encompassing both Nonalcoholic Fatty Liver Disease (NAFLD) and Alcoholic Fatty Liver Disease (AFLD). Participants were included irrespective of age, sex, caste, occupation, or socioeconomic status, provided they were willing to participate and comply with the study protocol. Exclusion criteria ruled out patients with advanced liver conditions such as cirrhosis, hepatocellular carcinoma, or active hepatitis, as well as those with viral hepatitis (HCV, HBV, HIV, Hepatitis A, or D), pregnant or lactating women, individuals undergoing chemotherapy, radiotherapy, or ICU management, those on medications for other diseases, and uncooperative patients. These criteria ensured the selection of a well-defined and manageable patient population.

Reasons for the selection of the drug

Manjistha (Rubia cordifolia) and *Bhumyamlaki (Phyllanthus niruri*) were selected for their proven hepatoprotective, fat-reducing, and detoxifying properties. *Manjistha*, with its *Raktashodhaka*[i] (blood-purifying), anti-inflammatory, and *Kapha-Pitta* balancing effects, enhances liver detoxification, metabolism, and fat reduction. Administered as a *Phant*, it ensures better bioavailability and efficacy in managing fatty liver disease. *Bhumyamlaki*, known for its antioxidant[ii], anti-inflammatory, and lipid-regulating properties, protects hepatocytes, reduces liver fat, and promotes detoxification. These complementary actions make them ideal candidates for addressing fatty liver disease comprehensively.

Observation and Results:

The study included 60 patients, with 30 in each group (Group A: *Manjistha Churna* as *Phant*, Group B: *Bhumyamlaki Churna*). Most patients were male (73.34%) and married (91.66%). The highest prevalence of fatty liver was observed in the 40–50 years age group (35%), followed by 30–40 years (28.34%). Grade 1 fatty liver was the most common (61.66%), followed by Grade 2 (30%) and Grade 3 (8.34%). Patients commonly reported hyperacidity (70%), flatulence (53%), heaviness in the abdomen (40%), and constipation (52%) as primary symptoms.

Table-1.1. Analysis of Common Symptoms in Both Groups

Symptoms	No. of Patients		Total	Percentage
	Group A	Group B		
Hyper-hyperacidity	17	25	42	70%
Flatulence	17	15	32	53%
Heaviness in Stomach	11	13	24	40%
Constipation	15	16	31	52%
Low Appetite	4	9	13	22%
Pain in Abdomen	10	9		

This distribution highlights the predominance of digestive-related complaints in the dataset.

Intragroup Study

A. Effect on Subjective Parameters within Group (Wilcoxon matched-pairs signed-ranks test)

For the evaluation of the effect of therapy within the group before treatment and after treatment for the subjective parameters **Wilcoxon matched-pairs signed-ranks test** was used.

Table No. 1.2: Analysis of Symptom Score intragroup before and after treatment in both groups:

Subjective Parameters	Group	Mean		Mean diff.	SD±	SE±	W	P
		BT	AT					
Hyperacidity	A	1.367	0.4333	-0.9333	1.015	0.1853	-136.0	<0.0001
	B	1.900	0.9667	-0.9333	0.6915	0.1262	-253.0	<0.0001
Heaviness in abdomen	A	0.7667	0.2000	-0.5667	0.8172	0.1492	-66.00	<0.0001
	B	0.7333	0.2333	-0.5000	0.7768	0.1418	-81.00	<0.05
Constipation	A	0.6333	0.1000	0.5333	0.5713	0.1043	-120.0	<0.0001
	B	0.6333	0.2667	-0.3667	0.4901	0.08949	-66.00	<0.0001

Flatulence	A	0.5667	0.1333	-0.4333	0.5040	0.09202	-91.00	<0.05
	B	0.5000	0.2000	-0.3000	0.4661	0.08510	-45.00	<0.05
Anorexia	A	0.1333	0.000	-0.1333	0.3457	0.06312	-10.00	<0.05
	B	0.5333	0.06667	-0.4667	0.8193	0.1496	-45.00	<0.05
Pain in abdomen	A	0.3333	0.000	-0.3333	0.4795	0.08754	-55.00	<0.05
	B	0.3000	0.06667	-0.2333	0.4302	0.07854	-28.00	<0.05

Table: 1.3 Intergroup Comparison of Subjective Parameter in Group A and B:

Symptom	**Mean diff.**		**SD±**		**SE±**		**P value**	**Sig.**
	A	**B**	**A**	**B**	**A**	**B**		
Hyperacidity	-0.9333	-0.9333	0.6261	0.8087	0.1143	0.1477	0.0093	YES
Flatulence	-0.5667	-0.5000	0.3457	0.4068	0.06312	0.07428	0.7306	NO
Heaviness in abdomen	0.5333	-0.3667	0.4068	0.5040	0.07428	0.09202	>0.9999	NO
Constipation	-0.4333	-0.3000	0.3051	0.5208	0.05571	0.09509	0.2332	NO
Anorexia	-0.1333	-0.4667	0.000	0.2537	0.000	0.04632	0.4915	NO
Pain in Abdomen	-0.3333	-0.2333	0.000	0.2537	0.000	0.04632	0.4915	NO

Both groups demonstrated significant improvements across the evaluated symptoms of fatty liver disease. For **hyperacidity**, Group A showed a reduction in mean scores from 1.367 to 0.4333, reflecting a 70.09% relief, while Group B exhibited a decrease from 1.900 to 0.9667, achieving a 77.22% relief. Intergroup analysis revealed that Group A's improvement was statistically significant ($p = 0.0093$). In terms of **flatulence**, Group A showed a reduction from 0.5667 to 0.1333 (34.30% relief), and Group B from 0.5000 to 0.2000 (50% relief), with no statistically significant difference between the groups ($p = 0.7306$).

For **heaviness in the abdomen**, Group A achieved a notable reduction in scores from 0.7667 to 0.2000 (75.68% relief), while Group B's scores decreased from 0.7333 to 0.2333 (52.06% relief). Although Group A exhibited a higher percentage of relief, the intergroup difference was not statistically significant. In the case of **constipation**, Group A demonstrated a decrease in scores from 0.6333 to 0.1000 (55.14% relief), and Group B reduced scores from 0.6333 to 0.2667 (63.76% relief). Here, the intergroup difference was also not statistically significant ($p = 0.2332$).

For **anorexia**, Group A showed minor improvement with mean scores decreasing from 0.1333 to 0.000, while Group B exhibited a more pronounced improvement from 0.5333 to 0.06667, reflecting a 48.68% relief. However, the difference between the two groups was not statistically significant. Finally, for **pain in the abdomen**, both groups showed significant relief. Group A reduced scores from 0.3333 to 0.000, and Group B from 0.3000 to 0.06667, with no significant intergroup difference observed ($p = 0.4915$). These findings highlight the overall effectiveness of both treatments in alleviating symptoms associated with fatty liver disease.

B). INTRAGROUP COMPARISON: EFFECT OF THERAPY ON OBJECTIVE PARAMETERS (PAIRED T TEST)

Table-4.3.3: Intragroup comparison of objective parameter

Invest.	**Group**	**Mean**		**Mean diff.**	**SD±**	**SE±**	**W**	**P**	**S**
		BT	**AT**						
USG	A	1.433	0.7333	0.7000	0.4661	0.08510	-231.00	<0.0001	0.6963
	B	1.500	0.7333	-0.7667	0.5040	0.09202	-253.00	<0.0001	0.7364

In Group A, the mean USG score before treatment was 1.433, which decreased significantly to 0.7000 after therapy, with a mean difference of 0.7333. This change was statistically significant, with a p-value of less than 0.0001. The percentage change in USG scores and a W-value of -231.00, along with a correlation coefficient of 0.6963. In Group B, the mean USG score before treatment was 1.500, which decreased to 0.7333 after therapy, with a mean difference of 0.7667. Like Group A, this reduction was statistically significant, with a p-value of less than 0.0001. The W-value of -253.00 and a correlation coefficient of 0.7364.

Discussion

Fatty liver disease (FLD), encompassing both Non-alcoholic Fatty Liver Disease (NAFLD) and Alcoholic Fatty Liver Disease (AFLD), represents a significant global health challenge due to its asymptomatic progression and association with severe complications like cirrhosis and hepatocellular carcinoma. This study evaluated the comparative efficacy of two Ayurvedic formulations, *Manjistha Churna* as *Phant* and *Bhumyamlaki Churna*, in managing fatty liver disease.

Both treatments demonstrated significant therapeutic impacts on symptoms commonly associated with fatty liver disease (FLD). For **hyperacidity**, a frequent manifestation linked to impaired digestion and Pitta imbalance, Group A (*Manjistha Churna* as *Phant*) achieved a relief percentage of 70.09%, while Group B (*Bhumyamlaki Churna*) demonstrated a slightly better relief at 77.22%. The enhanced bioavailability of active compounds in the *Phant* preparation of *Manjistha* likely contributed to quicker symptom alleviation. Despite both groups showing substantial intragroup improvement, Group A statistically outperformed Group B ($p = 0.0093$), reflecting *Manjistha's* stronger *Pitta*-balancing effects.

In terms of **flatulence**, both groups showed notable improvements with Group A achieving a 34.30% reduction and Group B 50%. The absence of statistically significant intergroup differences ($p > 0.05$) suggests that both treatments were comparably effective, albeit through different mechanisms—*Manjistha* pacified *Vata dosha* and cleared bowel obstructions, while *Bhumyamlaki* reduced liver congestion and enhanced digestion.

For **heaviness in the abdomen**, commonly linked to *Kapha* accumulation and sluggish digestion, Group A showed greater symptom relief (75.68%) compared to Group B (52.06%). *Manjistha's Ruksha* and *Laghu* properties, combined with its ability to balance *Kapha* and enhance *Agni*, likely accounted for the superior improvement. Although *Bhumyamlaki* also significantly reduced abdominal heaviness by addressing *Ama* and improving fat metabolism, the stronger impact of *Manjistha* was evident.

Both treatments were effective in managing **constipation**, a symptom associated with impaired liver detoxification and metabolic stagnation. Group A achieved a 55.14% relief, while Group B showed a slightly higher relief of 63.76%. *Manjistha's* mild laxative properties, supported by its *Ushna Virya*, facilitated improved bowel movements, whereas *Bhumyamlaki's* hepatoprotective and detoxifying actions promoted smoother digestion and waste elimination. Intergroup differences were not statistically significant ($p > 0.05$).

In addressing **anorexia**, Group B exhibited more substantial improvement with a relief percentage of 48.68%, compared to minimal changes in Group A. *Bhumyamlaki's* pronounced effect on liver function and digestive health appeared critical in restoring appetite, making it more effective in resolving anorexia than *Manjistha*, which provided only general digestive support.

Lastly, for **pain in the abdomen**, both groups experienced significant reductions. Group A achieved complete relief (mean post-treatment score of 0.000), likely due to *Manjistha's* anti-inflammatory and *Kapha-Pitta* balancing properties. Group B also showed effective pain reduction, attributed to *Bhumyamlaki's* hepatoprotective and anti-inflammatory effects, though a small residual pain score remained in some cases (mean post-treatment score of 0.06667). These findings highlight the comparable effectiveness of both treatments, with certain advantages based on symptom-specific responses.

Ultrasonography Findings

Both treatments significantly reduced liver fat grades, as evidenced by improvements in ultrasonography scores. Group A showed a mean difference of 0.7000, while Group B exhibited a slightly higher mean difference of 0.7667. However, the intergroup analysis revealed no statistically significant difference in USG outcomes ($p = 0.8303$). This indicates that both *Manjistha Churna* as *Phant* and *Bhumyamlaki Churna* are equally effective in reducing liver fat content, validating their therapeutic efficacy in managing fatty liver disease.

Probable Mode of Action

Manjistha (Rubia cordifolia) primarily works by balancing *Kapha* and *Pitta doshas*, purifying the blood, and enhancing liver detoxification. Its *Ushna Virya* stimulates digestion, while its *Ruksha* and *Laghu Gunas* effectively reduce fat and improve circulation, alleviating liver congestion. The *Phant* preparation enhances the extraction of active compounds like anthraquinones, amplifying its hepatoprotective and fat-reducing properties.

Bhumyamlaki (Phyllanthus niruri) focuses on hepatocyte protection, liver detoxification, and lipid regulation. Its *Sheeta Virya* pacifies *Pitta* and inflammation, while active compounds like phyllanthin and hypophyllanthin combat oxidative stress and improve liver enzyme activity. By reducing *Ama* and promoting lipid balance, *Bhumyamlaki* addresses the underlying pathology of FLD effectively.

Conclusion and Implications

The findings underscore the efficacy of both *Manjistha Churna* as *Phant* and *Bhumyamlaki Churna* in managing fatty liver disease, with each offering unique advantages. *Manjistha* was more effective in reducing hyperacidity and heaviness in the abdomen, while *Bhumyamlaki* excelled in alleviating anorexia. The comparable reduction in liver fat grades highlights their equal potential as

hepatoprotective agents. This study reinforces the role of Ayurvedic formulations as viable therapeutic options for FLD, paving the way for their integration into mainstream treatment protocols. Future research could explore their long-term effects and synergistic use in combination therapies.

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