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## THERAPEUTIC IMPACT OF PIPPALI RASAYANA (PR) TREATMENT ON VARIOUS CLINICAL SIGNS AND SYMPTOMS OF HUMAN *GIARDIASIS* PATIENTS

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### ABSTRACT

The combined ayurvedic herbal formulation- Pippali Rasayana (PR), was prepared from *Piper longum* (pippali) and *Butea monosperma* (palash) following the original methods of Caraka Samhita (2700-600 B.C.). In this study, 45 patients of human giardiasis, with definite clinical signs and symptoms and case history were given the rational dose of PR 1 gm. P.O. × 3 × 15 days. The clinical symptoms of patients were examined. Results demonstrated the profound clinical improvement in all the signs and symptoms of human giardiasis patients. These findings are suggestive of the curative value of PR in clinically managing human giardiasis. Considering these observations, a lead may be taken for conducting an intensive scientific clinical study to confer PR the global status of a futuristic herbal drug of choice for human giardiasis.

### Key words

Human giardiasis, *Giardia lamblia*, clinical signs and symptoms, allopathic drugs, ayurvedic herbal drugs, Pippali Rasayana.

## Introduction

Giardiasis in human beings, caused by a protozoan parasite- *Giardia lamblia*, is marked by more than three watery bowel defecation per day. Diarrhea, abdominal pain, vomiting, belching, bloating, fat in stool, ingestion, nausea, appetite loss, malnutrition, cramps, foul smelling stool, weight loss etc. are well known clinical symptoms of giardiasis (Taherkhani et al., 2009; Escobedo et al., 2010). The immune status, nutritional condition and differences in virulence and pathogenicity of *Giardia* assemblages in hosts are the main factors to determine the severity of infection and disease (Haque et al., 2005). Further, poor hygienic conditions and lower socio-economic status are the prominent precipitating factors for diarrhea- the malabsorption bowel syndrome, frequently in malnourished human beings (Mandomando *et al.*, 2007; Aremu *et al.*, 2011). This infection varies from 20-60% (Ament and Rubin, 1972) worldwide with an alarming endemicity of about 87% in certain regions of India because of the poor hygiene (Walia et al., 1986) in lower socio-economic groups. The prevalence of *G. lamblia* in human beings ranges from 2 to 7% and 20 to 30% in developed and developing countries, respectively (Solaymani-Mohammadi and Singer, 2010). Approximately 1000 million cases of giardiasis occur worldwide (Wright et al., 2003). Giardiasis, more severe in terms of morbidity than mortality, adversely affects the financial wellbeing of sufferers by causing immense loss of productive hours, premature mortality and exorbitant

healthcare expenses (Guerrant et al., 2005). The occurrence of asymptomatic cases (Farthing, 1989) support the hypothesis of emerging a high degree of variations in clinical signs and symptoms of giardiasis making it more difficult for diagnosis and treatment.

The success of synthetic drugs, for clinically treating human giardiasis (Kumar et al., 1989), is highly debated throughout the world because of their inherent side toxic and severe adverse effects including transient reversible neutropenia (Lau et al., 1992), drug resistance, withdrawal effects, relapses, immune suppression, availability and high costs. These all collectively culminate in denial of their prompt and frequent uses (Jokipil and Jokipil, 1979; Gardner and Hill, 2001; Wright et al., 2003). The headache, vertigo, nausea and metallic furry tongue are serious adverse experiences of such treatments. The foregoing deliberations on modern synthetic drug associated disturbances, including accessibility of hospitals in remote areas, compelled the people to develop supreme faith in accepting the herbal medicines as clinically effective remedies for healthcare and clinical management of giardiasis worldwide. The safe clinical efficacy and eco-bio friendly actions of herbal formulations as drugs would be added benefits.

*Piper longum* is reported to be used in Krim Roga and works to revitalize the host immune system supporting through Rasayana mode of therapy (Shastri and

Chaturvedi, 1986). *Piper longum* bears the therapeutic properties against giardiasis (Jadavji, 2011) including anti-giardial and immunostimulatory (Tripathi et al., 1999), immunomodulatory and antitumor (Sunila and Kuttan, 2004) and antimicrobial activities (Ali et al., 2007). Koul and Kapil (1993) investigated the hepatoprotective activity of pippali. The promising clinical efficacy, availability, inexpensiveness and medicinal uses in various human ailments like cancer, inflammation, depression, diabetes, obesity and hepatotoxicity (Kumar et al., 2011) further make Pippali clinically more valuable for intensive research studies to establish PR as an alternative ayurvedic herbal drug against human giardiasis. The present deliberations on beneficial impacts of Pippali, for various human diseases, show scarcity of researches on clinical signs and symptoms of human giardiasis except for our own preliminary reports (Agrawal et al., 1997). We, henceforth, performed research investigations on PR effects in clinically managing various signs and symptoms of giardiasis. This research study is targeted to unravel the beneficial roles of PR on clinical signs and symptoms of giardiasis patients and provides sound basis for furthering the studies on curative potential of Pippali Rasayana. The ultimate goal is to ensure the availability of a futuristic herbal drug of choice against human giardiasis for global uses.

## Results and Discussion

**Table** showing the effect of Pippali Rasayana (PR) treatment on various clinical signs and symptoms of human giardiasis patients (No.45).

S.	Symptoms	No. of Giardiasis Patients	No. of Giardiasis Patients
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## Materials and Methods

### Preparation of Pippali Rasayana

Pippali Rasayana (PR), a combined ayurvedic herbal formulation, was prepared from *Piper longum* (pippali) and *Butea monosperma* (palash) following the original methods of Caraka Samhita (2700-600 B.C.) as presented in Caraka Chikitsa (Pandeya, 1983) and adopted by Agarwal et al. (1994).

### Human giardiasis patients

The 45 human giardiasis patients, with definite clinical signs and symptoms and positive for trophozoites/cysts in stool, were included in this study. In order to evaluate the therapeutic potential of PR on clinical signs and the symptoms, all the patients were selected from the clinic of International Institute of Herbal Medicine, Gomti Nagar, Lucknow.

### Study of clinical signs and symptoms

The 45 patients, with definite giardiasis signs and symptoms and case history, were administered 1 gm. of PR filled in veg. capsules P.O.  $\times$  3  $\times$  15 days. Before starting the treatment and after 15 days of treatment, the clinical signs and symptoms of all these human giardiasis patients were assessed, analyzed and recorded properly. The observations, as tabled here, clearly depicted an overall improvement in the clinical signs and symptoms of human giardiasis patients. It, thus, endorsed the clinical and therapeutic potential of PR.

No.		BT with PR	% age	AT with PR	% age	
1	Diarrhoea	14/45	31.11	3/45	6.67	
2	Weight loss	19/45	42.22	5/45	11.11	
3	Nausea	10/45	22.22	4/45	8.89	
4	Dyspepsia	28/45	62.22	11/45	24.44	
5	Foul Smell	32/45	71.11	12/45	26.67	
6	Pain in abdomen	20/45	44.44	6/45	13.33	
7	Salivation	15/45	33.33	7/45	15.56	
8	Constipation	4/45	8.89	Nil	0.00	
9	Belching	11/45	24.44	3/45	6.67	
10	Fever	8/45	17.78	2/45	4.44	
11	Flatulence	16/45	35.56	2/45	4.44	
12	Headache	24/45	53.33	11/45	24.44	
13	Anorexia	20/45	44.44	8/45	17.78	
14	Vomiting	11/45	24.44	3/45	6.67	
15	Heart burn	23/45	51.11	6/45	13.33	
16	Cramps of the body	30/45	66.67	8/45	17.78	
17	Quantity of stool	(a) Bulky	25/45	55.56	4/45	8.89
		(b) Normal	14/45	31.11	41/45	91.11
		(c) Scanty	6/45	13.33	Nil	0.00
18	Fatigueness	27/45	60.00	11/45	24.44	

### BT- Before Treatment, AT- After Treatment, PR- Pippali Rasayana

The detrimental health complications like constipation, flatulence, heart burn, belching, anorexia, pain in abdomen, cramps of the body, vomiting diarrhoea and foul smell of stool are the main pathological signs and symptoms of giardiasis. Similarly, nausea, salivation and quantity of stool are marked as the consequential effects of this protozoan infection. Further, weight loss, fever, headache and fatigueness are the afterward cumulative serious health hazards of giardiasis precipitating as secondary complications to affect adversely the vitality, functionality and productivity of sufferers. Keeping in mind the severity and complications of clinical signs and

symptoms in human giardiasis as diagnostic markers, 45 human patients, with definite clinical signs and symptoms and case history of giardiasis, were included in this study. A scientifically rational dose of 1 gm. TDS (thrice a day) was given for 15 days orally to these patients.

The findings demonstrated an overall significant improvement in all the clinical signs and symptoms of human giardiasis patients after 15 days of treatment with PR. Some of the clinical signs and symptoms, like diarrhea, abdominal pain, weight loss, constipation, flatulence, vomiting, body cramps, fatigueness and quantity of stool are worth stating in terms of recovery and improvement following PR treatment. The

constipation in 100% patients was cured. A marked success in the clinical treatment of flatulence (swelling in stomach) was observed where 87.50% cases were cured successfully. Our observations are in fair agreement with earlier reports on antimicrobial nature of *Piper longum* (Ali et al., 2007). A total of 78.57% giardiasis patients were clinically cured of diarrhea while weight loss was recovered in 73.68% cases. Similarly, the abdominal pain in 70% cases was cured following PR treatment. The reduction in pain might have occurred due the analgesic action of *Piper longum* (Vedhanayaki et al., 2003), however, further researches are required to prove and establish the analgesic property of *Piper longum*.

The above observations supported the strong anti-etio-pathogenic nature of PR with enhanced and promising clinical efficacy and therapeutic value in containment of infection and combating the disease. Vomiting in 72.72% patients stopped following PR treatment. It may be explained on the basis of research observations made by Hong et al. (2005) wherein *Piper longum* was reported for its antidepressant like activity possibly influencing the nervous system, however, detailed researches are needed to validate such comprehensions. Cramps of the body were found clinically cured in 73.33% giardiasis cases. Stool normalcy enhanced many times indicating the recovery and cure in 27 out of 41 patients. Likewise, the bulky volume of stool was normalized in 84.00% cases following PR treatment. The hepatoprotective potential of *Piper longum* might further be enhancing the therapeutic impacts of PR on several pathological complications of giardiasis (Koul and Kapil, 1993). Abbas et al. (1997) also reported the positive effects of PR in empowering the physiology of patients

under study, however, detailed studies may satisfy our concept. The fatiguensness in 59.36% cases was recovered and normalized indicating the betterment in physiological status of the sufferer. We have already reported the rejuvenating role of PR on immune system in patients under investigation (Agrawal et al., 1997; Tripathi et al., 1999).

Deliberating so much, it may be concluded that PR effects on clinical signs and symptoms of human giardiasis patients have not been reported till date, except for our preliminary reports (Agrawal et al., 1997; Abbas et al., 1997). The reports from Ayurveda, on use of *Piper longum* in Krim Roga with rejuvenation properties for the host immune system through Rasayana mode of therapy (Shastri and Chaturvedi, 1986), also favour PR for further intensive research studies considering as a potent candidate therapeutic formulation to treat and clinically cure human giardiasis with significant effects on clinical signs and the symptoms. The PR treatment related impacts on clinical symptoms may provide a fundamental basis in developing PR as an effective herbal drug for clinical treatment of human giardiasis.

### Conclusion

The results clearly showed an encouraging and significant trend of improvement in various clinical signs and symptoms of human giardiasis patients and endorsed the beneficial effects of PR. Through this research study, it was attempted to evaluate the clinical relevance of PR formulation for further studies leading to develop it as an alternative herbal drug of choice against human giardiasis patients. This communication also suggests the anti-giardial and immunological roles of PR on clinical signs and symptoms of giardiasis. Ayurvedic Rasayana mode of therapy is known to work

mainly as rejuvenator for empowering the clinically effective immunological responsiveness. The scientific researches are immensely needed for determining the clinical relevance of PR as an innocuous and clinically effective ayurvedic herbal drug of choice by strengthening the immunological status of the host without any probable adverse effect.

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