

## CLINICAL STUDY ON THE EFFECT OF *SHUNTHYADI YOGA* ON THE CONSISTENCY AND FREQUENCY OF DIARRHEAL EPISODES IN CHRONIC RECURRENT CHILDHOOD DIARRHEA

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### ABSTRACT

**Background:** Most of the digestive diseases are chronic or recurrent and lead to more disability than acute transient illness, chronic recurrent diarrhea is one of the most common disease in childhood, which arrest the proper growth and development of child. It affecting 3-5 billion cases per year and accounts for over 20% of all deaths in under five year children's. **Design:** Randomized control trial **Age group:** 1 – 5 yrs. of either sex **Materials & Methods:** 60 cases were selected from Outpatient Department and Inpatient Department of National Institute of Ayurveda and local survey of school/Aanganwari of Jaipur city for the study. That were satisfied the inclusion and exclusion criteria. They were randomly divided in Two groups, 30

patients in each group. In Group A Trial Drug *Shunthyadi Yoga* was given in syrup form and in Group B zinc supplement in tablet form and probiotic in suspension form was given and sign and symptoms was assessed by proper grading. **Results:** Extremely significant results were seen in Group A over Group B. **Conclusion:** *Shunthyadi Yoga* showed extremely significant results in all the symptoms without any recurrences and side effects in chronic recurrent diarrhea and improves the health in all aspects where as zinc supplement and probiotic also found extremely significant but due to some side effects and recurrences it is not effective and beneficial as trial drug *Shunthyadi Yoga*.

**KEYWORDS:** Chronic recurrent diarrhea, *Shunthyadi Yoga*, zinc supplement, probiotic.

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## INTRODUCTION

Childhood is a period in which growth and development rate is on its peak. Any factor affecting it in this period will not only disturbed the growth of the child but it also affects the development, general activities, social behavior, immunity, concentration power and school performance. Most of the digestive diseases are chronic or recurrent and lead to more disability than acute transient illness, with its high prevalence and highest morbidity & mortality. So, one of the major hindrance in a proper development of child today is chronic recurrent diarrhea. The global annual burden of disease diarrhea is huge, affecting 3-5 billion cases and causing approximately 2million deaths a year, diarrhea accounts for over 20% of all deaths in under five year children's.<sup>[1]</sup>

In this study we correlates this chronic recurrent childhood diarrhea with *Grahani Roga* in *Ayurvedic* view according to its causes, pathogenesis, onset, chronicity and its sign and symptoms. *Grahani* is a disease related with gastrointestinal disorders. This condition is seen more in childhood period due to irregular dietary habit like over-eating; more ingestion of cool, heavy, dry, fried and dehydrated, less or food lacks in essential micro nutrients like zinc. A wide variety of gastrointestinal symptoms like loss of appetite, abdominal pain, recurrent semisolid or loose motion, abdominal distension, weight loss (malnutrition), dehydration etc., have been reported in children. All these causative factors and symptoms are explain in the *Ayurvedic* classics for *Grahani Roga* is also explain in same way for chronic recurrent childhood diarrhea by modern science and in relation with stool consistency chronic recurrent diarrhea have symptom like "some times watery and some times semisolid stool" with and without abdominal pain and is resembles with "*Pakvam Va Sa Rujam Puti Muhur Badhham Muhur Dravam*" symptom of *Grahani Roga* by *Aacharya Sushruta* in "*Atisar pratishedhadhyaya*" in *Uttartantra*,<sup>[2]</sup> He also explained that *Samprapti* of *Grahani Roga* is as - After occurrence of *Atisar* (diarrhea) *Vyadhi* (disease) if, patient or normal subject continues the *Apathya Aahar* then it vitiates the *Jatharagni* again and which vitiates the *Grahani* ultimately leads to *Grahani Roga*. *Aacharya Vagbhata* also said in 8<sup>th</sup> chapter of *Nidan Sthana* "*Atisar Grahani Dosh Nidan*" if we neglect the *Atisar Vyadhi* or not treat it properly then it will lead to *Grahani Roga*,<sup>[3]</sup> In present study also 45% of patients were having past history of *Atisar Vyadhi* which may convert in to chronic recurrent diarrhea

(*Grahani Roga*) due to negligence of *Atisar* (diarrhea). *Vaghabhata* mentioned that, *Atisar* is *Aashukari* (acute) in nature and *Grahani Roga* is *Chirkari* (chronic) or long lasting disease which also indicates *Atisar* is *Aashukari* (acute) and *Grahani* is *Chirkari* (chronic) condition of diarrheal disease and both *Aacharya*, *Sushruta* and *Vaghabhata* mentioned description of *Atisar Vyadhi* and *Grahani Roga* in same chapter All these points indicates that *Atisar* is *Aashukari* (acute) stage of diarrhea and *Grahani* is *Chirkari* (chronic) stage of diarrhea. So, for we correlates chronic recurrent diarrhea with *Grahani Roga* in present study.

## DRUG REVIEW

The formulation having the property of *Deepana-Pachana* and *Grahi* had been selected as trial drug for present study in the form of *Shunthyadi Yoga* described in *Chakradatta*,<sup>[4]</sup> (*Grahani Chikitsa Prakaran*) mentioned for. It contains four herbs: *Shunthi*, (*Zingiber officinale* Roxb.), *Ativisha* (*Aconitum heterophyllum* Wall) *Guduchi* (*Tinospora cordifolia*), *Mustaka* (*Cyperus rotundus* Linn.) All of drugs were taken in same quantity. *Aacharya* has mentioned it in *Kwatha* form but here syrup form was selected for convenience and palatability of the patients.

It is useful in sluggish digestive fire, chronic *Aama*, and recurrent episodes of diarrhea with loose and watery consistency of stool (*Grahani Roga*). The drugs in the combination was found having appetizer, digestive, anti- diarrheal, carminative, anti-spasmodic, antibacterial, anti-amoebic, anti-inflammatory, anthelmintic, stomachic, anti-viral, anti-pyretic, anti-Giardia, immune-modulator effects.

## MATERIALS AND METHODS

**Study design:** An open prospective Randomized clinical trial.

**Selection of Cases:** Patients between 1 – 5 year age of chronic recurrent diarrhea with non infectious cause from the *BalRoga* Outpatient Department, Inpatient Department, of NIA (Jaipur) and survey of local Aanganwaris/school of Jaipur city with the help of Accredited Social Health Activist, were selected for the present study.

### Grouping and administration of drug

Total 70 patients were screened from mentioned sources out of them 10 patients were excluded due to some acute and major illness and remaining 60 patients were registered for research study and divided randomly in Two groups, 30 patients in each group and No any

single patient was dropped out or discontinued the treatment. As, this study was conducted by doing survey of local school/Aanganwari of Jaipur city with the help of ASHA workers and OPD, IPD of Balroga dept. of National Institute of Ayurveda, Jaipur.

The 60 cases divided into two groups (each group 30 patients) as follows:

Group-A: 30 patients received Trial drug (*ShunthyadiYoga*)

Group-B: 30 patients received control drug (zinc supplement and probiotic sachets)

#### For trial group- A

**Drug Dosage** : 1ml/kg/day in two divided doses.

**Drug form** : syrup.

**Administration** : Oral.

**Period of trial** : 2 months

**Anupana** : water.

**Follow up** : Done every 15<sup>th</sup> day for consecutive 3 months (2month trial with drug and 1 month follow up with out drug).

#### For control group- B

**Drug Dosage** : zinc-10 mg BD and probiotics 1sachet/day in two divided dose.

**Drug form** : zinc in tablet form and probiotics in suspension form.

**Administration** : Oral.

**Period of trial** : zinc 14 days and probiotics for 5 days.

**Anupana** : water.

**Follow up** : Done every 15<sup>th</sup> day for consecutive 3 months (14 days with control medicine and rest 76 days follow up with out drug).

#### Inclusion Criteria

1. The Patients having age between 1 to 5 years of age.
2. Patients fulfilling the conditions of chronic recurrent childhood diarrhea, of non infectious cause with greater than 2 weeks of episodes were selected.
3. Antibiotic induced diarrhea.
4. Malnutrition with chronic diarrhea. (up to grade 3<sup>rd</sup> of PEM, acc.to. IAP grading of malnutrition)
5. Anemia with chronic diarrhea.
6. This project has been cleared by Institutional Ethics Committee vide its letter No. IEC/ACA/ 2015/37, dated: 18-05-2015 and 19-05-2015

## 2. Criteria for Exclusion of the Patients

1. Acute lower respiratory infection.
2. Lactose intolerance.
3. Metabolic disorder.
4. Hormonal disorder.
5. Immunocompromised cases.
6. Congenital anomalies.
7. Cases of acute diarrhea.
8. Cases in which rota virus vaccination done.
9. Hemoglobin less than 7gm%.

## Discontinuation Criteria

1. Parent/Guardian is not willing to continue the treatment.
2. Patient develops life threatening complication during treatment.
3. Any other severe illness.

## Assessment Criteria

Consistency and frequency of diarrheal episodes

1. Frequency of motion per day.
2. Frequency of diarrheal episodes per time period.
3. Consistency of stool per episode.
4. Volume of stool per episode.

## OBSERVATIONS

**Table 1: Showing Observations and Discussion.**

Distribution of patients	Overall Observation	Discussion
Age wise division	Maximum 36 (60%) were in age group >3-5 years.	As it is <i>Annad Kala</i> child demands for different food items ( <i>Laulya</i> ) <sup>[5]</sup> and consuming more fast food and junk food, this faulty dietary habits vitiates <i>Agni</i> and results in GIT disorders like <i>Grahani Roga</i> .
Gender wise division	Maximum 31 patients (52%) were females	It was noticed during trial period, in some families more importance is given to male child (i.e. child discrimination). There is no specific relation found between Gender and the disease in the present study

Family wise division	Majority of patients i.e. 62% were from nuclear family. <sup>[6]</sup>	Unawareness of parents towards care about appetite, bowel and bladder of their children's due to busy schedule of their work and unawareness about importance of type and time of proper food habit.
Habitat wise division	Maximum i.e. 57% patients were from urban slum area. <sup>[7]</sup>	Faulty food habits, unhygienic environment, polluted and contamination of water and vegetables, also stressful life seem to be the reason for high incidence
Socio economic status wise division	Maximum number of patients i.e. 47% were belongs to Lower middle class, 28% of patients were from lower class and 20% from middle class.	Children's living in low socio economic class may exposed to diets either low in zinc or high in phytates (limits the Bio availability of zinc) that compromises zinc uptake so, these children's are at high risk of chronic recurrent diarrhea. <sup>[8]</sup>
Sources of water supply wise division	52% were depended upon Municipal water supply followed by 30% patients were drinking ground water. <sup>[9]</sup>	There are much chances of contamination of water if, supplied by community services in slum area or in lower and middle socio economic class. this contamination directly leads to GIT diseases like chronic recurrent diarrhea.
Sanitation wise division	Maximum i.e. 42% found with poor condition of sanitation, 27% of patients were found with moderate sanitation, 23% of patients were found with unhygienic condition. <sup>[10]</sup>	There is important relation between health and sanitation, Most of the people in lower class family suffering from chronic recurrent diarrhea due to contaminated food and water supply in poor sanitary condition.
Past history wise division	In 45% patients, <i>Atisara</i> was found as Past History	As per <i>Aacharya Sushruta</i> <sup>11</sup> and <i>Vaghabhata</i> <sup>12</sup> if patient does not follow proper <i>Pathya</i> after <i>Atisar Vyadhi</i> or not treated it well it leads to <i>Grahani</i> (chronic diarrhea) and in <i>Atisar</i> , increased faecal loss of zinc which increases the risk of chronic recurrent diarrhea.
<i>Satva</i> wise division	Majority of patients 52% enrolled in the study were of <i>Avara Satva</i> , followed by 43% of <i>Madhyama satva</i> .	<i>Balyavastha</i> is considered as <i>Akleshasaha</i> , <i>Mridu</i> , <i>Sukumar</i> with <i>Avar Bala</i> , <i>Avar Aahar</i> , <i>Avar Vyayam Shakti</i> and hence <i>Avara Satva</i> due to this <i>Avar Satva</i> they were more prone to diseases. (body maturity, immune system and tolerance capacity is less) so, more prone to diseases of GIT like diarrhea.
<i>Koshtha</i> wise division	In majority of cases, <i>Koshtha</i> was observed as <i>Mridu</i> 43%. followed by <i>Madhyam</i> 42%,	consumption of fast food, junk food and bakery products leads to <i>Pitta Dushti</i> and ultimately <i>Mridu Koshtha</i> and if GIT of <i>Mridu Koshthi</i> vitiates it will lead to increased frequency of loose stools due to 'Sar' Guna of vitiated <i>Pitta Dosha</i> .



Nature of stool wise division	Semisolid and loose (watery) nature of stool was found in maximum number and in equal proportion i.e. 38% in each type, mucoid stool was observed in 16% of patients.	<i>Agnimandya</i> is the root cause of disease, occurs due to faulty dietary habits and faulty life style. When <i>Agni</i> and <i>Vata</i> does not perform its normal function, stool passes in indigested form. vitiated <i>Doshas</i> affects on stool. And the main <i>Lakshana</i> regarding stool consistency in <i>Grahani Roga</i> is “ <i>Muhur Badhham Muhur Dravam</i> ” means “some time semi solid and some times watery”
<i>Agni</i> wise division	82% patients had <i>Mandagni</i> , followed by 18% of <i>Vishamagni</i> .	Due to faulty dietary habit and life style it vitiates the <i>Agni</i> and causes <i>Agnimandya</i> which is prime phenomenon of the disease
Appetite wise division	68% with poor appetite. Average appetite was found in 32% of patients.	<i>Dosha Prakop</i> – <i>Agnimandya</i> – <i>Aama</i> formation – <i>Strotoavarodha</i> – <i>Arochaka</i> .

## RESULTS

**Table 2: Effect of therapy on Frequency of motion per day.**

Group	Mean		D	N	%	S.D	S.E	‘p’ value	Remarks
	B.T	A.T							
A	1.700	0.06667	1.633	30	96	0.4901	0.08949	<0.0001	ES
B	1.733	0.3333	1.400	30	81	0.6215	0.1135	<0.0001	ES

Before treatment, all patients of both groups was suffering from disturbed frequency of motion per day. After completion of treatment symptom was relieved by 96%, in group A and 81% in group B. Results show that the improvement in the severity scores is extremely significant in both the groups with ‘p’ value < 0.0001.

**Table 3: Effect of therapy on Frequency of diarrheal episodes per time duration.**

Group	Mean		D	N	%	S.D	S.E	‘p’ value	Remarks
	B.T	A.T							
A	3.233	0.06667	3.167	30	98	1.262	0.2304	<0.0001	ES
B	2.633	0.7333	1.900	30	72	0.9229	0.1685	<0.0001	ES

Before treatment, all patients of both groups was suffering from recurrent diarrheal episodes after gap of particular time period. After completion of treatment this recurrences was relieved by 98%, in group A and by 72% in group B. Results show that the improvement in the severity scores is extremely significant in both the groups with ‘p’ value < 0.0001.

**Table 4: Effect of therapy on Consistency of stool per episodes.**

Group	Mean		D	N	%	S.D	S.E	'p' value	Remarks
	B.T	A.T							
A	2.400	0.1333	2.267	30	94	1.202	0.2194	<0.0001	ES
B	2.433	0.6667	1.767	30	73	1.073	0.1958	<0.0001	ES

Before treatment, all patients of both groups was suffering from abnormal consistency of stool. After completion of treatment symptom was relieved by 94%, in group A. and by 73% in group B. Results show that the improvement in the severity scores is extremely significant in both the groups with 'p' value < 0.0001.

**Table 5: Effect of therapy on Volume of stool per episodes.**

Group	Mean		D	N	%	S.D	S.E	'p' value	Remarks
	B.T	A.T							
A	2.100	0.2333	1.867	30	89	0.8604	0.1571	<0.0001	ES
B	2.133	0.6000	1.533	30	72	0.8193	0.1496	<0.0001	ES

Before treatment, all patients of both groups was having the abnormal volume of stool per episode. After completion of treatment symptom was relieved by 89%, in group A and 72% in group B. Results show that the improvement in the severity scores is extremely significant in both the groups with 'p' value < 0.0001.

## DISCUSSION

In the present study, both groups shows extremely significant results in symptoms of chronic recurrent diarrhea like abnormal consistency, volume, frequency and recurrences due to their anti diarrheal, anti inflammatory and immuno modulator effects of the both trial and control drugs. But percentage wise improvement found more in Group A *Shunthyadi Yoga* treated patients than in Group B and adverse effects like stomach upset mild weakness and recurrences found in some patients of Group B due to side effects of zinc supplement. Zinc and probiotic worked together by improving intestinal permeability for water and electrolyte transport and nourishing intestinal micro flora but these drugs gives protection up to some period and recurrences may be occurred where as in trial Group A *Shunthyadi Yoga* worked very effectively on the root cause of disease and avoid recurrences and gives benefits to the patient by all healthful aspects, As *Shunthi* is best *Agnideepana*, *Aamapachana*,<sup>[13]</sup> anti diarrheal,<sup>[14]</sup> gastro protective properties.<sup>[15]</sup> *Musta* is best *Sangrahi*, *Deepana*, *Pachana*,<sup>[16]</sup> anti diarrheal and anti spasmodic.<sup>[17]</sup> *Ativisha* is best in all childhood disorders specially in Diarrhea by its anti diarrheal, anti secretary,<sup>[18]</sup> *Deepana*, *Pachana*, *Grahi* properties.<sup>[19]</sup>



*Guduchi* is best *Tridoshar*, *Deepan*, *Pachana*, *Rasayana*,<sup>[20]</sup> anti diarrheal, anti dysentery and anti helminthic properties,<sup>[21]</sup> so, by these properties it gives relief from abnormal consistency, volume, frequency and recurrences in chronic diarrhea and improves health in all aspects without any side effects and alleviates the disease from its root.

## CONCLUSION

- Chronic or recurrent diseases lead to more disability than acute transient illness
- Chronic recurrent diarrhea is completely curable If the proper care is taken
- Certain socioeconomic and environmental factors are responsible for a much greater prevalence of digestive disorders. And these disorders affect the persons at the prime period of their life i.e., in the young - most productive part of the life and the children during the crucial stage of growth and development.
- *Shunthyadi Yoga* showed extremely significant results in all the symptoms of chronic recurrent diarrhea (*Grahani Roga*) so, Drug was found highly effective and improves the health in all aspects.
- No adverse effects of the *Shunthyadi Yoga* were observed during and after the trial period in any single patient but mild weakness and occasionally stomach upset observed after treatment in some patients in control group it may be due to side effects of zinc supplementation.
- The control group medicine (zinc supplement and probiotic sachets) also worked effectively in these symptoms of chronic recurrent diarrhea but recurrence (gives relief in diarrheal episodes up to some particular time period) and mild side effects are seen in some cases so, it is not effective as much as trial drug "*Shunthyadi Yoga*".

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