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Study to Assess the Effect of Neem Leaves Preparation in Worm Infestation among the Preschool Children Attending Selected Anganwadies in Area of Karad Taluka

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Abstract: ***Introduction: Invasion of worms or worm infestation is a worldwide public health problem. One third of the world's population is infected with one or more species of intestinal helminthes, It is estimated to affect over 200 million people in India and public health specialists are concerned that these infections impair children's growth and development. Objective: To find out prevalence of worm infestation and evaluate effectiveness of neem leaves preparation in worm infestation by microscopic stool examination among preschool children attending selected Anganwadies in area of Karad Taluka. Methodology: Evaluative approach with pre test post test control group design was adopted .The study was conducted on 30 preschool children detected by microscopic stool examination method for worm infestation and who those are attending Anganwadies in area of Karad Taluka by using non probability purposive sampling technique. The instrument used for data collection was standardized questionnaire and microscopic stool examination. Result: Before administration of neem leaves preparation, the prevalence of Roundworm was maximum 21(70%) But after administration it was reduced 0. Whereas the Prevalence of Pinworm before administration 2(6.6%) and after administration it was 2(6.7%). Among hook worm before administration of neem leaves preparation it was 1(3.3%) and in H. nana was 6(20 %) but after administration of neem leaves preparation hook worm was 1(3.3%) and H. nana was 0. So there was significant reduction in Round worm and H. nana. Conculsion: Neem leaves Preparation significantly reduces the worm infestation. So in future one can incorporate neem leaves preparation as a part of intervention in the community set up in treating the children for worm infestation.***

Keywords: preschool children, neem leaves preparation, Anganwadi, worm infestation

1. Introduction

Children constitute large sections of the population in India. It is a great challenge to the nation to provide health, education and food to the children below 15 years who are the dependant, unproductive section comprising 40% of the total population of the country (Census 2006). (1)

Worm infestation is one of the major of childhood malnutrition, anemia, stunted physical and mental growth, psycho-social problems and this along with repeated gastrointestinal and upper respiratory tract infection contributes to high morbidity in children and remains a major cause of high infant and child mortality in our country Any human being get infection through fecal-oral route. If defecation is done in open fields, the eggs of worms from stools of infected humans and animals find in the soil and grow there. Children playing in such contaminated soil can easily be infested by worms. (2)

Children, who eat without washing their hands, transfer the harmful eggs, sticked to their nails, into their stomach where they become fully developed worms. These worms stick to the lining of the intestines and suck blood leading to anemia and other symptoms of worm infestation. They can grow to the extent of obstructing intestines causing acute pain and landing the patient in an emergency seeking condition. Tiny thread worms come out of the anus in the night to lay eggs around, causing itching. (3)

The World Health Organization (WHO) estimates that infection with Roundworm (Ascaris lumbricoides), Whipworm (Trichuristrichiura) and Hookworms (Ancylostomaduodenale and Necatoramericanus) with associated morbidity, affect approximately 250 million, 46 million and 151 million people, respectively (Awasthi et al, 2008). Intestinal parasitism is a priority health problem, since worm infestation is seldom the direct cause of death; they tend to be regarded as relatively unimportant. Worm infestation is probably more significant than specific vitamin and mineral deficiencies in developing countries. In India, the problem is likely to be more common because of bad hygiene, poor awareness, illiteracy, misbelieves, poverty and variety of allied factors. Studies carried out in various parts of India have reported a prevalence of intestinal parasitism up to 30-50% and anemia from 40-73% among school going girls. (4)

The word Neem originates from the word “Nimbo” which means “reliever from sickness”. All the parts of Neem leaf, flower, bark and root are of medicinal value and contain innumerable chemical compounds. Pure certified organic Neem leaf made up of 20% fiber, 50%carbohydrates, 15% proteins, 5% fat, 8% ash, 2% calcium, essential amino acids, carotene and ascorbic acid.(5)

Tender leaves along with black pepper are effective in intestinal helminthiasis. The Neem leaves are extensively used as an old and popular remedy for skin disease.

The fresh juice of Neem leaves with honey is used in the treatment of skin diseases and jaundice, 1 gm. of Neem leaves powder with Jaggery for 15 days helps in worm infestation completely because of its anti-helminthic effects. The juice of Neem leaves of 10 ml. along with honey and Asafetida powder (5 gms.) removes intestinal worms in children; 100 gm. of the extract was obtained from 10 kg. of Neem leaves. 1113 gm. of the extract was administered to patients orally as single dose in empty stomach, exhibited remarkable antihelmintic property. [6]

Since the worm infestation is a common problem among children and the Neem leaves has the antihelmenthic action, Keeping in view the above information neem is having therapeutic effect of antihelmintic helps in children's life remain the first and best step to cure worm infestation the investigator was interested to test its effectiveness.

2. Review of Literature

1. S. Aswathi et al (2008): A cross-sectional study conducted regarding the prevalence and risk factors associated with worm infestation in children below 5 years in rural India. Over all 909 fecal samples examined. Combined prevalence of infestation with intestinal geohelminths treatable by albendazole and other intestinal parasites non-treatable by albendazole was 50.3% (457/909) and 51.6% (469/909), respectively. Exclusive use of hand pump water (OR = 1.79, CI = 1.36-2.35, P < 0.001) and use of hand pump water plus field defecation increased risk of geohelminthic infection (OR = 1.75 CI = 1.34-2.30, P < 0.001) while use of well water (OR = 0.45 CI= 0.33-0.60, p < 0.001) and exclusive use of soap and water practice for hand washing after defecation was protective (OR = 0.54, CI = 0.40-0.73, P < 0.001). Since almost half the children are infected with intestinal geohelminths treatable by albendazole, targeted de-worming of population in this age group should be considered. [7]

2. Bandyopadhyay U et al (2004) : Clinical studies on the effect of Neem (Azadirachta indica) bark extract on gastric secretion and gastroduodenal ulcer were carried out in human subjects by Banyopadhyay et al. A group of patients suffering from acid-related problems and gastroduodenal ulcers were orally treated with the aqueous extract of Neem bark. The lyophilized powder of the extract when administered for 10 days at the dose of 30 mg. twice daily caused a significant (p < 0.002) decrease (77%) in gastric acid secretion. The volume of gastric secretion and its pepsin activity were also inhibited by 63% and 50% respectively. Some important blood parameters for organ toxicity such as sugar, urea, creatinine, serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase, albumin, globulin, hemoglobin levels and erythrocyte sedimentation rate remained close to the control values. The bark extract when taken at the dose of 30-60 mg. twice daily for 10 weeks almost completely healed the duodenal ulcers monitored by barium meal X-ray or by endoscopy. One case of esophageal ulcer (gastro esophageal reflux disease) and one case of gastric ulcer also healed completely when treated at the dose of 30 mg. twice daily for 6 weeks. The levels of various blood parameters for organ toxicity after Neem treatment at the doses mentioned above remained more or less close to the normal values suggesting no significant adverse effects[8]

3. Research Methodology

Research approach and design: descriptive evaluative approach with pre-experimental one group pretest post test design was found to be feasible to measure the effectiveness of Neem leaves preparation on worm infestation.

Setting: The study was conducted in Anganwadis in the area of Karad Taluka.

Target population: The study population comprised Anganwadie's children in the age group of 3-6 years in area of Karad Taluka.

Sample: The sample chosen in the present study was 30 Preschool children, 30 Preschool children who were detected with worm infestation by microscopic stool examination by investigator.

Sampling Technique: Simple random technique was used to select the Agnganwadi. All children from these Agnganwadi will be examined or investigated for worm infestation by Microscopic stool examination. If number of positive sample is less than 30 another Agnganwadi will be selected till the total positive cases becomes 30 .The positive samples were taken by non probability purposive sampling technique

Sample size: In the present study the total sample size was 30 preschool children who were attending Anganwadies in selected Anganwadies at Karad taluka.

Inclusion Criteria
1) Parents of children who are willing to participate in the study
2) Children with stool examination by microscopic shows positive for worm infestation.
3) Children age group is between 3 to 6 years

Exclusive Criteria
1) Who were sick and absent during data collection.
2) Who had undergone de-worm*ing last six months.*

4. Description of the Tool

The tools used for the data collection in this study were divided into three sections:

Section I: This section consist of demographic characteristics of children, seeking information such as age, gender, diagnosis, nature of surgery performed, education of father, education of mother and education of child, monthly family income, child age, religion, birth order and some baseline data related to the worm infestation like hand washing practice, place of defecation, use of slippers for

defecation, use of raw fruits and vegetable and practices and habit of eating pica.

Section II: Consist of 8 items regarding worm infestation. Items were related to stool examination and data related to worm infestation for pre test like microscopic and gross stool examination.

Section II: Consists of same 8 items regarding worm infestation. Items were related to stool examination and data related to worm infestation for post test to assess the effect of Neem leaves preparation on worm infestation microscopic and gross stool examination.

Neem Leaves Preparation

The prepartion was prepared at Dr. Shyamsunder Ayurvedic Clinic and Panchakarma Centre Karad By Dr. Nachiket Wachasunder validation of procedure was taken.

- Standerdised dried Neem leave powder was taken from Dr. Shyamsunder Ayurvedic Clinic and Panchakarma Centre Karad.
- The Neem leaves powder was measured as 1 gm. dose divided into 2 doses that is 500 mg. and administered in the form of tablet.
- These tablets were dried under sunlight shadow to become solid and palatable.
- The tablets were coated with the 2 gm. of Jaggery daily fresh coatings of tablet were done.
- Above procedure was done under strict aseptic technique and supervision.
- Later this preparation was administered to the preschool children detected for worm infestation by the investigator.

5. Method of Data Collection

The final data collection was scheduled from 8 October to 19th November 2012. Permission was obtained from the Child Development Project Officer of Karad Taluka, to conduct the study at selected Anganwadies of Karad Taluka. Formal permission was taken by HOD of Microbiology department for examination of stool sample. The Child Development Project Officer was given information about study to Anganwadies Sevikas.

On the first day the investigator observed the setting and structure appliances for use. The investigator explained the purpose of the study to the parents. The investigator had given information about study to the parents.

Data Collection done in following Steps

1) Stool sample collection and laboratory testing

Firstly the procedure of stool collection was explained to caregiver of children. The participants were given two dry, clean, leak proof containers labeled with their name, age and identification number for collection of stool samples the next day parents were instructed on how to collect the sample during the parents meeting. Collected pre and post stool samples were transported to the laboratory by Investigator.

2) Identification of ova

One drop of normal saline was placed on a clean slide and a small amount of stool sample (~2mg) was thoroughly mixed. A cover slip was placed on top of the sample. Then, it was observed under the microscope using low power (×10) objective lens. One drop of iodine solution was placed on the clean slide and small amount of stool sample (~2mg) was fully mixed. A cover slip was placed on top of the sample. Then, it was observed under the low power (×10) objective of light microscope

3) Pre-intervention phase

After microscopic examination of stool samples detected for worm infestation 30 samples were taken in the study in experiment group. After obtaining written consent from the parent or guardian of the child, a Baseline interviewer structured questionnaire were used to collect data.

4) Intervention phase

After pre-test administration of Neem leaves preparation was started. The tablets are prepared from Neem leaves powder in the form of 500 mg. Two tablets of 500 mg. were administered to children by keeping 30 min. interval at breakfast and lunch. It was given with Jaggery coating. The treatment was given for 15 regular days by the researcher.

5) Post-intervention phase

After intervention again the participants were given dry, clean, leak proof containers labeled with their name, age and identification number for collection of stool samples for the post test.

6. Results

Section I: It deals with Analysis of Demographic Data of Samples characteristics.

Table 1: frequency and percentage distribution of sample characteristic, n=30

Sr. No.	Characteristic	Frequency (f)	Percentage (%)
1	**Age of mother**		
	18-20	1	3.3
	21-25	13	43.3
	26-30	14	46.6
	31-36	2	6.6
2	**Education of mother**		
	No formal education	5	16.7
	Primary	13	43.4
	Higher secondary	10	33.3
	Graduate and above	2	6.6
3	**Occupation**		
	Housewife	21	70
	Service	3	10
	Agriculture	6	20
	Business	0	0
4	**Age of child**		
	3 to 4 years	8	26.3
	4 to 5 years	12	40
	5 to 6 years	10	33.3
5	Gender of child		
	Male	14	46.6
	Female	16	53.3
6	**Religion**		
	Hindu	23	76.7
	Muslim	6	20
	Christian	1	3.3

7	**Income**		
	Below 5000 Rs	19	63.3
	Rs 5001 -10,000	10	33.3
	Rs 10,001-15,000	1	3.3
	Rs 15,001 and above	0	
8	**Diet**		
	Veg	5	16.6
	Non –veg	5	16.6
	Mixed	20	66.7
9	**Residence**		
	Urban	7	23.3
	Rural	23	76.7
10	**Type of house**		
	Kaccha	9	30
	Pakka	21	70
11	**Place of defecation**		
	Public toilet	9	30
	Private toilet	10	33.7
	Open field	11	36.3
12	**Source of water supply**		
	Bore	10	33.3
	Well	1	3.3
	River	7	23.3
	Tap	12	40
13	**Hand washing practices after defecation**		
	Yes	11	36.7
	No	2	6.7
	Sometimes	17	56.7
14	**Habit of pica**		
	Yes	23	76.7
	No	7	23.3

Data presented in Table No. 1 shows that maximum mothers 14 (46.6%) belongs to the age group of 26-30 years, 13 (43.3%) were educated up to primary level and maximum mothers 21 (70%) were Housewife.

Maximum children 12 (40%) belongs to 4 to 5 year age group and majority children were female 16 (53.3%) , Maximum children 23 (16.76%) belongs to Hindu religion. Almost children 19 (63.3%) belong to families with monthly income of below Rs. 5000, majority20 (66.7%) children were taking mixed diet, 21 (70%) were having pakka type of house and most of them 23 (76.7%) were residing in rural area

Regarding to place of defecation among the study sample 11 (36.3%) children were using open field method, maximum children 12 (43.0%) were using tap water, 17 (56.7%) were washing hands sometimes after defecation and maximum 23 (76.6%) were having habit of pica.

Section II: Analysis of prevalence of worm infestation

Table 2: Description of prevalence of worm infestation among preschool children

Type of worm	Frequency	Percentage
Roundworm	21	70%
Pinworm	2	6.7%
Hookworm	1	3.3%
Hymenolepsis nana	6	20%

Table No. 2 shows description of prevalence of worm infestation The data presented in above table shows prevalence of worm infestation among preschool children which was detected by microscopic stool examination maximum prevalence was 21 (70%) of Roundworm (Ascaris lumbricoides) Pinworm 2 (6.7%), minimum prevalence 1 (3.3%) was Hookworm and 6 (20%) Hymenolepsis nana. The common prevalence is of Roundworm.

Section III: Analysis of effect of Neem leaves preparation on worm infestation

Table 3: Description of effect of Neem leaves preparation on worm infestation, n = 30

Parasite	Pre test		Post test	
	Frequency	%	Frequency	%
Roundworm	21	70	0	0
Pinworm	2	6.6	2	6.7
H. nana	6	20	0	0
Hookworm	1	3.3	1	3.3

Description of effect of Neem leaves preparation to data presented in table no 3 shows that before administration of Neem leaves the prevalence of Roundworm was maximum 21 (70%) But after administration it was reduced 0% the Prevalence of Pinworm before administration 2(6.6%) and after administration in post tests it was 2 (6.7%). Before administration Hookworm was 1 (3.3%). H. nana was 6 (20%) and after administration it was 0% so there is significant reduction in Roundworm and H. nana

Table 4: Effect of neem leaves Preparation in Worm infestation, n = 30

Result of Worm infestation	Pre test		Post test		Fisher's Exact P value
	Frequency	%	Frequency	%	
Positive samples	30	100	3	10	<0.0001
Negative samples	0	0	27	90	

From Data presented in table no.4 It was observed that Worm infestation was reduced by 27 (90%) after intervention of Neem leaves preparation for a period of 15 days this reduction was statistically significant (Fisher"s Exact $p<0.0001$).

7. Discussion

In present study Prevalence of worm infestation among preschool children which was detected by microscopic stool examination, from overall prevalence of worm infestation the maximum prevalence of Roundworm (Ascaris lumbricoides) was 21 (70%), Hymenolepsis nana 6 (20%), Pinworm 2 (6.7%), and minimum prevalence of Hookworm was 1 (3.3%). The results are similar with the study conducted by Ahmad Khan, Abida Sultana, Abdul Majid Khan in Pakistan in 2004 results revealed 21.7% prevalence of infestation with highest incidence of Ascaris lumbricoides (51.72%) and zero incidence of Hookworms. Hymenolepsis nana was the second commonest helminthes (27.59%). Entrobius vermicularis (13.79%), trichuris trichura (3.45%) and taenia sagineta were recorded (3.45%) [(9)] . Another study by Yogyata Marothi and Binita Singh (2011) at Department of Microbiology, R. D. Gardi Medical

College, Ujjain (MP), Madhya Pradesh, India shows that Overall prevalence rate of intestinal parasite was 21.4%. Entamoeba histolytica (10.5%) was the commonest protozoa followed by Giardia lamblia (3.9%). Among the helminths, Ascaris lumbricoides (2.8%) was the commonest. Multiple infections were seen in 70 samples. There was difference in prevalence between urban (20.2%) and rural (23.1%) population. Females (27.4%) were more affected than males (18.2%) and age group 0 to 10 years [(10)]Another study conducted by the Chiranjay Mukhopadhyay, Godwin Wilson, Kiran Chawla, Binu VS in western Nepal in 2008 shows similar findings shows that the overall prevalence in hospital attending children was 9.2% with 7.6% in preschool (0-5 years) and 11.0% in school age (6-15 years) children, and in community 17.7% with 14.8% in pre-school and 20.5% in school-age children. Ascaris lumbricoides, Trichuris trichiura, Ancylostoma deodenale and Strongyloides stercoralis were the common geohelminths with a gradual decrease in worm load over the years. Schoolage children were found to be significantly more prone to geohelminth infection as compared to preschool children [(11)]

It was observed that Worm infestation was reduced by 27 (90%) after intervention of administration of Neem leaves preparation for a period of 15 days this reduction was statistically significant (Fisher‟s Exact p<0.0001). Hence H1 is accepted at 0.05 level of significance as there is significant reduction in prevalence of worm infestation after administering Neem leaves prepartion. This finding was more appreciable and it was much higher than the findings from a study done in K. Indumathi (2011) in Chennai While assessing the degree of worm infestation through pre-test, it was found that most (93.3%) were with the severe degree of worm infestation before administration of neem flower powder. The finding of degree of worm infestation of pre-school children after 67 administration of neem flower powder was found that (90%) were mild signs and symptoms. [(12)]

8. Limitations

- Variables like pharmacological management and other factors like diet and other Remedies were beyond the control of the investigator.
- The study had no control group to compare the effectiveness of Neem leaves.
- The samples were selected by purposive sampling method limiting the generalizability

9. Conclusion

The prime aim of the study was to assess the effect of Neem leaves preparation on worm infestation among preschool children attending selected Anganwadies in area of Karad Taluka. Worm infestation was reduced by 27 (90%) after intervention of Neem leaves preparation for a period of 15 days this reduction was statistically significant (Fisher‟s Exact p<0.0001). Neem leaves paste significantly reduces the worm infestation. So in future one can incorporate Neem leaves preparation as a part of intervention in the Community set up in treating the children for worm infestation as the administration of neem leaves preparation is simple , economical and easy to implement, easily available, no notable side effects and acceptable to reduce the degree of worm infestation among pre-school children

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