

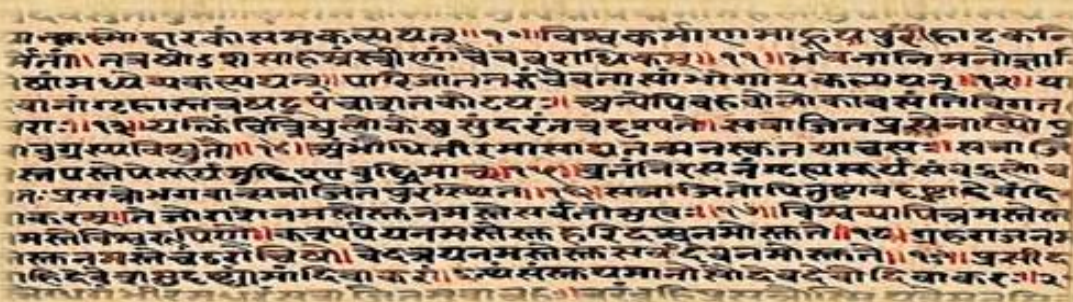
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Role of Lehan: Assessment of efficacy of Preenan Modak as Lehan in Infants with malnutrition.

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ABSTRACT

Kaumarbhritya , one of the special branches amongst eight branches of Ayurveda focuses on all aspects of nursing and healthy upbringing of child right from birth to an adult by holistic approach for a better progeny and society. Protein energy malnutrition is an enduring problem in India due to ignorance of mother and poverty. In today's competitive world, poor weaning in infancy results in malnutrition and impaired cognitive and social development which results in poor performance in school and reduced productivity in later life. In present study effect of Preenan Modak; along with homemade food given in study group and only homemade food in control group is assessed on weight, height, head circumference, and chest circumference in 60 patients from OPD of Kaumarbhritya deptt. of M.S. Ayurved college & Hospital , Kudwa, Gondia, Maharashtra. Both Preenan Modak and Homemade food is given in dose of 10 gm twice daily for 90 days to 8 to 12 months old children. Preenan Modak showed a significant effect on Growth & Development of Infant. A significant reduction in number of attacks of infection and improvement in peaceful sleep has been observed. Hence Preenan Modak is an effective weaning food that is Lehan !

KEYWORDS: *Preenan Modak, Growth & Development, Weaning food, Lehan.*

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Introduction:

In children, the term “Healthy” refers to the normal Growth & Development.¹ Growth & Development is directly proportional to food, hygiene, play, education and social interaction. Malnutrition is defined as inadequate nutrition.² A total of 10.4 million children died in 2004, mostly in low and middle income countries.³ An estimated 39% of these deaths (4.1 millions) were caused by micronutrient deficiencies, underweight, suboptimal breast feeding and preventable environmental risk.⁴ Underweight is the root cause of one third of diarrhoea, measles, malaria and lower respiratory tract infections.⁵ India accounts for 40% of the world malnourished children while containing one fifth of the world’s population.⁶ In an analysis of community studies, it was projected that 41% of deaths in under five children are associated with malnutrition and more than three fourth of these malnutrition deaths are linked to mild to moderate malnutrition not severe malnutrition.⁷ Undernutrition is outcome of insufficient food intake, inadequate care and frequent infections. Underweight in children is a serious implication of susceptibility to other problems like immunodeficiency, low appetite, low academic performance and behavioural disorders. These children have irregular bowel habits leads to lack of interest, reduced memory and concentration. Hence it is a task to normalize & revitalize his growth and development. Concentrated energy dense complementary foods are essential in order to maintain an adequate velocity of growth for the Infant.⁹ Weaning is defined as the process of progressive transfer of the baby from breast milk to usual family or adult diet. Weaning food must be high in energy, easy to digest, low in bulk and viscosity and easy to prepare.¹⁰ Establishing of appropriate and quality weaning food that assist in motor skills and motor development is important.¹¹ There is need for complimentary food which is with optimum nutritional value and also economically sustainable. Preenan Modak is stated in “Ashtanghrudaya”.¹² It is a unique combination of laja (puffed rice), sugar, priyal seeds, yashtimadhu and Honey. It is recommended as first weaning food and during dentition period. Preenan Modak is economically affordable too. Puffed rice is easy to digest and strengthens body. It is recommended in vomiting and diarrhoea which is frequent in infants. Priyal seeds are tonic for heart and strengthening body. Yashtimandu is rejuvenating (Rasayan) and brain tonic (medhya). This study is assessing efficacy of preenan modak on infant’s growth and development.

Material & Methods :

Aim : To study the efficacy of Preenan Modak on growth and development in infants as lehan (weaning food)

Objectives : To study the efficacy of Preenan Modak on weight, height, chest circumference, head circumference and midarm circumference of infant.

To study the efficacy of Preenan Modak on development of infant.

Source of Data : Infants were selected randomly from out patient’s department of M.S. Ayurvedic College and Hospital Kudawa, Gondia. Ethical clearance was obtained from institutional ethics committee of M.S. Ayurvedic College, Gondia. The consent was taken from patients and their parents.

Methods of Collection of Data :**Inclusion Criteria :**

Subjects of age group of 8 – 12 months were selected irrespective of their gender, caste and religion. Immunized children are only selected.

Exclusion Criteria :

- 1) Infants of premature birth.
- 2) Infants having severe to moderate malnutrition kwashiorkor or marasmus.
- 3) Infants with congenital disorders like cleft lip or cleft palate etc.
- 4) Infants suffering from systemic diseases like tuberculosis, HIV, & Hbs Ag positive patients.
- 5) Infants having CNS disorders like cerebral palsy, mental retardation and congenital disease.
- 6) Unimmunized Infants

Study Design :

Plan of Study : 60 patients were allocated into two groups of 30 patients in each group

Study Group[A] : The patients in study group were given Preenan Modak along with homemade diet for 90 days .

Control Group [B] : the patients were in control group were given only homemade diet for 90 days .

Follow up : the patients of both groups assessed before (0th day) during and after (90th day) study for growth and development .

Assessment Criteria : In each group , growth and development were assessed at , 0th day , 30th day, 60th day and 90th day by anthropometrical evaluation and changes occurred in achievement of age specific developmental milestone. Scoring system was adopted for assessment of different developmental milestones with grades from zero to two, according to the appearance of different milestone at different ages. (0= early, 1= timely, 2= late)

Statistical Analysis:- The obtained data was analysed statistically using statistical analysis tool SPSS version 26 and expressed in terms of mean, standard deviation (SD), t value and p value in paired 't' test and unpaired 't' test.

Preparation of Trial Drug (Preenan Modak):- The intervention of 100 gm Preenan Modak contains Laja (puffed rice), 40 gm, Priyal seeds(Buchanania Lazen Spleng) 10 gm, Yashtimadhu (Glycyrrhiza glabra)10gm, Honey 10gm, sugar 30gm. Raw material of herb purchased from herbs raw material supplier from Gondia. This raw material was authenticated in pharmacognosy laboratory of Dravyaguna Department of M. S. Ayurved college, Gondia. All ingredients of Preenan Modak were churned in powder form first then mixed well according to given formula. Interventional medicine is prepared in Rasashstra & Bhaishajyakalpana deptt. of M. S. Ayurved college, Gondia.

Properties of Herbs in Preenan Modak:-

1. Laja :- English name- Puffed rice

Properties—Extremely light to digest, balances tridosha, Useful in thirst, diarrhoea, nausea, improves appetite , pacifies pitta, cold in potency. 14 gm puffed rice contains 56kcal calories, 13 gm carbohydrate, 4.4gm iron, 16mg potassium, calcium 0.8mg,0.9mg protein.¹³

2. Priyal:- Botanical name—Buchanania Lazen spleng Roxb.

Medicinal properties— Guna –Snigdha, guru, Rasa—Madhura Veerya --- sheet Vipaka—Madhur, Effect on tridosha – Balances vata and pitta. It is aphrodisiac (wajikar), cardo tonic, rejuvenating (Rasayan)¹⁵ Part used is seeds kernel.¹⁶

Constituents	Content
Starch	12.1%
Proteins	19 – 21.6%
Lipids/fats	59%
Fatty oil	34-47%
Niacin	1.50 mg
Vit B1(thiamine)	0.69mg
Vit B2 (riboflavin)	0.53mg
Calcium	279mg
Iron	8.5 mg
Ascorbic acid	5mg
Moisture	3%
Fibre	3.8%

3.Yashtimadhu:- Botanical name-Glycyrrhiza glabra Linn.

Medicinal properties—Rasa-Madhura, Guna—Guru,Snigdha, Vipaka- Madhura, Veerya—Sheeta.

Effect on dosha—Vatpittahara

Useful part—root

Pharmacological actions – Hepatoprotective, antiviral, antiulcer, antipyretic, antioxidant, expectorant¹⁷

3. Madhu (Honey):_properties of Honey :- Rasa- Madhur

Anurasa- Kashaya

Guna-Laghu (easy to digest), Vishad (clarity), Rooksha (dryness)

Vipaka—Madhur

Veerya—Ushna

Effect on Tridosha—balances Kapha and Pittadosha.

Pramathi is special property of Honey by which it carries medicine or make it reach to every smallest part of body.^{17, 18}

Mode of administration of weaning food:-

Study group(A)—Along with homemade diet, intervention Preenan Modak was given 10 mg twice daily for 90 days.

Control group(B)—Homemade mashed food given only.

Observations:- It is observed that 32 subjects were male while 28 were female. 48 subjects were from Hindu community, 4 from Christian and 8 from Muslim community. 36 were first child, 16 were second child where as 8 were 3rd child of mother. Age wise distribution showed that 21 children were of 9 months, 22 of 10 months, 7 are of 11 months age and 10 are over 11 months to 12 months age. 46 were born by normal delivery while 14 were by LSCS. All children were vaccinated. No patient is dropped out of this study. 35 subjects attained neck holding at 3rd month, 23 at 3.5 month while 2 at 4th month. 36 children rolled over at 5th month, 24 rolled over at 5.5 month. 2 children attained sitting with support at 5th month, 39 attained at 6 month's age, 13 attained at 7 month's age whereas 6 attained at 7.5 month. 33 subjects attained crawling at 8 month's age while 27 at 9 month's age. 5 subjects transfer object hand months hand at 6 month's age, 32 attained at 7th month and 23 attained at 8 month's age. 46 objects attained pincer grasp at 9 month's age while 14 attained it at 10 month's age. 8 subjects attained social smile at 4 month's age, 38 attained smile at 5 month's age while 14 attained smiles at 6 month's age. 46 subject bubbles at 6 month's age, while 14 bubbles at 7 month's age. 54 children imitate sound at 9 month's age while 6 subjects attained it at 10 month's age.

Results:- The result shows that mean difference in weight of subjects of study group is 2.272 and in control group is 1.753 where t value is 2.449 and p value is 0.020 which is significant. Difference between height of study group is 9.194 where as in control group it is 7.156 with t value 2.652 and p value 0.012 which is significant. Mean difference in head circumference of study group is 4.256 and control group is 3.744 where t value is 0.993 and p value is 0.328 that is insignificant. Mean difference in chest circumference of study group is 5.483 and in control group it is 4.550 where t value is 1.651 and p value is 0.109 which is insignificant. Mean difference of mid arm circumference is 2.056 in study group where as it is 1.756 in control group with t value is 1.364 and p value 0.182 which is insignificant. While comparing both groups for development as it is in study group 1.444 while in control group 0.301 with t value 5.766 when $p < 0.001$. For fine motor development it is 1.333 for study group and 0.188 in control group, where t value is 4.965 when $p < 0.001$ proving highly significant. In language development it is 1.222 for study group and 0.250 for control group with t value 3.988 when $p < 0.001$ showing highly significant result. In social & adaptive development it is 1.333 in study group and 0.188 for control group where t value is 4.683 when $p < 0.001$ showing highly significant results.

Table no. 1 Mean Difference in objective parameters before treatment & after treatment

Anthropometric parameters	Mean difference In groups BT & AT		“t” value	“p” value	Result
	Gr. A	Gr. B			
Weight(kg)	2.272	1.753 (±0.548)	2.449	0.020	S

	(± 0.672)				
Height (cm)	9.194 (±2.291)	7.156 (±2.174)	2.652	0.012	S
Head circumference(cm)	4.256 (±1.474)	3.744 (±1.528)	0.993	0.328	IS
Chest circumference(cm)	5.483 (±1.542)	4.550 (±1.756)	1.651	0.109	IS
Mid arm circumference(cm)	2.056 (±0.637)	1.756 (±0.641)	1.364	0.183	IS

Table no. 2:-Assessment of Development, before treatment & after treatment

Groups	Mean		% Improvement	S.D	S.E	T Value	P value	Result
	BT	AT						
Gross motor development								
Gr. A	1.722	0.278	83.8	0.511	0.121	11.99	<0.001	HS
Gr. B	1.438	1.250	13.07	0.750	0.188	1.000	0.333	IS
Fine motor development								
Gr. A	1.667	0.333	80.0	0.594	0.140	9.522	<0.001	HS
Gr. B	1.375	1.188	13.6	0.750	0.188	1.000	0.333	IS
Language development								
Gr. A	1.611	0.389	75.8	0.548	0.129	9.457	<0.001	HS
Gr. B	1.500	1.250	16.7	0.856	0.214	1.168	0.261	IS
Social & Adaptive development								
Gr. A	1.667	0.333	80.0	0.594	0.140	9.522	<0.001	HS
Gr. B	1.500	1.313	12.5	0.834	0.209	0.899	0.383	IS

Table no. 3:- Comparison of both groups , Before treatment & after treatment

Mean difference in		T value	P value	Result
Group A	Group B			
Gross motor development				
1.444	0.301	5.766	<0.001	HS
Fine motor development				
1.333	0.188	4.965	<0.001	HS
Language development				
1.222	0.250	3.988	<0.001	HS
Social & adaptive development				
1.333	0.188	4.653	<0.001	HS

Discussion:- Mild moderate malnutrition is defined as the level of intake of energy or specific nutrients that is below the recommended daily allowances, which is associated with less than adequate physical growth or/ and changes in metabolism, but not the degree that would lead to significant wasting, stunting or clinical symptoms. ¹⁹ Krushata is the result of shoshita rasa dhatu causing decrease in mamsa of the body ²⁰: Acharya Dalhana has given the meaning of Atikarshyata as the reduction in upachaya, rupa and bala. ²¹ Alpashana and vishamasana (faulty feeding habits) results in karshya. Bruhmana, Rasayana, Vrushya are therapies mentioned in samhitas for malnutrition. Healthy growth of Dhatus, particularly kapha, mamsa, meda leading to proper development and enhancement of body is called as Bruhmana. Veeryapradhan Bruhmana Aushadha causes quicker results than that of Bruhmana Aahara. Kashyapacharya mentioned aahar as “Mahabheshaj”. in children Aahar act as Aaushadha if planned properly just like Preenan Modak. Priyal plays a major role as it is rasayan (rejuvenating), vrushya (aphrodisias), bruhamana, a heart tonic and a general tonic too as it is rich in calcium , protein , vitamins. Yashtimadhu is very much effective for respiratory and skin infections, which are common in children. It is swarya means it acts on larynx, throat and medhya means it is definitely helpful for brain growth. Thus it accelerates developmental growth of a child. Laja makes Preenan Modak a energy dense but easily digestive food. They are immunity builder also. Thus Preenan Modak proves a best weaning food.

Conclusion:- Preenan Modak is highly appreciated by parents as it is nicely accepted by children. Any type of untoward effect was not reported in this study. Preenan Modak showed better palatable taste with happy acceptance by children than homemade food. Preenan Modak is highly effective in accelerating Growth & Development of child. There is a significant increase in weight, height and developmental milestones. This may be because it is rich in protein, calcium, vitamins which are necessary for Growth & Development. It compensates gap between required and provided nutrition.

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