

# ROLE OF DIETARY AND LIFE STYLE MODIFICATION IN *STHAULYA* W.S.R. TO CHILDHOOD OBESITY

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## ABSTRACT-

*In the modern era of mechanical life, Childhood obesity accounts for major public health crisis throughout the world, as evidenced by its increased prevalence over few years. Imbalance between calorie intake and calories utilised due to various avoidable and unavoidable reasons are the major cause of same. Interrelation ship between genetic, behavioural, and environmental causes further worsens the situation. Physical, psychological, and social health problems along with decreased exercise tolerance are definite in childhood obesity. Hence, effective dietary, lifestyle and intervention strategies should be done to prevent the same and the urgent need of the hour. Hence addressing this major problem this study is focused on effective dietary and lifestyle management in Sthaulya (childhood obesity). 15 Patients of childhood obesity for present study were selected from OPD and IPD of PG Department of Bal Roga, NIA, Jaipur after screening them for the same by following different diagnostic criteria's. Promising, significant result was found in clinical, anthropometric and biochemical improvement profile, which concludes that patients treated with caloric diet as per age along with dietetic and life style modification is beneficial in treating childhood obesity, and thus highlighting importance of caloric diet, exercise.*

*Keyword:- Biochemical, Caloric, obesity, Life style, Sthaulya,*

## INTRODUCTION-

As evidenced by recent studies conducted worldwide Obesity is emerged as a major public health crisis among children as well as adults.<sup>(1,2)</sup> As per definition the percentage of weights for individuals if greater than the maximum expected weight with respect to age is considered as either overweight or obese. Present problem is of increasing concern due to its direct and indirect effects over the normal physiology of the child. Body mass index (BMI), a useful measure of weight with relation to height, is very helpful to assess the same and also a useful anthropometric index for cardiovascular risk.<sup>(3)</sup> For children between 2 and 19 years, BMI is plotted on the CDC growth chart to check for the corresponding age and sex related percentile.

Childhood obesity is defined as a BMI at or above 95<sup>th</sup> percentile for children of same age and sex<sup>(4)</sup>

Classifications of obesity in children depend upon the body composition of the child, as it varies with respect to age and sex of the child.<sup>(4)</sup> The prevalence of childhood obesity is increasing in developed and underdeveloped countries<sup>(5)</sup> and same is monitored nationally by using data from National Health and Nutrition Examination Survey. The report presented by NHANES for the year 2007-2008 was quite shocking to know that 16.9% of children and adolescent under the age group of 2-19 years were obese.<sup>(6)</sup> suggesting increased percentage from 5.0 to 18.1% .<sup>(6)</sup> Mean while survey in 2010 has ranked obesity as number one health problem showing that prevalence and subsequent increase over the years<sup>(7)</sup>.

It is certain that increased prevalence of childhood obesity will have definite morbidity and mortality implications in the future life <sup>(8)</sup>Worldwide concern over childhood obesity has been raised as certain western countries like England etc facing problems due to same over last few decades. <sup>(9)</sup> <sup>(5)</sup>

**Aims and Objective:** - The present paper aims to evaluate the role of Dietary and lifestyle modification in case of *Sthulya* s.r to childhood obesity.

#### **MATERIAL AND METHODS:-**

Patients of childhood obesity for present study were selected from OPD and IPD of PG Department of Bal Roga, NIA, Jaipur as well as various schools around Jaipur after screening them for the same by following different diagnostic criteria's. Total 15 cases were registered in the present clinical study. Total duration of the intervention was six month, and follow up was done on every 15 days. In the present study Individuals of either sexes aged between 5-15 years, children with familial tendency of obesity, obesity due to abnormal lifestyle and dietary habits, and Individuals having BMI more than 85<sup>th</sup> percentile of CDC growth charts 2000 were included. While Children who are below the age of 5 years and above the age of 15 years, children who will be suffering from any systemic and endocrinal illness like DM, Hypothyroidism etc, Obesity associated with chromosomal disorders, Children who are already on treatment for obesity or other disorders and drug induced obesity were excluded. Patients had been discontinued from the study in case of adverse effect of drug or other acute illness during the study.

Further the patients were assessed for effects of the therapy on the basis of various subjective and objective criteria. A special clinical research Performa was prepared incorporating various parameters like *Dashavidha Pariksha*, *Ashtavidha Pariksha* etc. by adopting the scoring method. Among the Objective Criterias Body Mass Index of the child (BMI)- was assessed before and after the treatment by the formula ( BMI = Weight (kg)/Height (m)<sup>2</sup>) and CDC growth charts (2000) were used to know age-sex specific BMI. Further Body Fat Analysis has been also done to calculate the total

body fat percentage by using body fat analyzer. Mean while Anthropometry, and Lipid profile has been also done to assess the cases objectively. <sup>Source: Nutrient Requirements and Recommended Dietary Allowances for Indians, I.C.M.R. 1990.</sup>

#### **METHOD OF STUDY:**

For estimating the diet and regimen and required calories as per age, weight and exercise, a dietetic chart has been prepared after referring various literatures and previous studies. Prior written consent was obtained from attendants before inclusion in the trial and also briefed about the entire research and nutritional plan. A Performa, which includes all the signs and symptoms of obesity or *Sthulya* as per Ayurvedic and Modern parameters has been prepared by giving undue importance for *Dosha*, *Dushya*, *Srotasa* and *Agni Srotas Priksha*, *Ashtavidha pariksha* and *Dashavidha Pariksha* *Nidana*, *Rupa*, *Upadrava*, etc. A detailed clinical history, and complete physical examination of each patient was carried out on the basis of this Performa and scorings will be given as per severity of the symptoms. These findings will be further compared with Laboratory investigations for assessment.

Certain strict Instructions were given to Patients as well as parents like, continue with their normal food habits but not to overeat or indulge in high calorie and high fat diet, to attend the hospital for regular follow-up as per protocol, to play outdoor games / cycling / skipping / for 30-60 minutes daily. For further transparency and accuracy a food chart was given to the parents which include following details. <sup>(10)</sup>

Foods to be included	Foods to be excluded
<ul style="list-style-type: none"> <li>• Rice, Chappati, Bread and Pasta Poha Idli</li> <li>• Dal</li> <li>• Sprouts</li> <li>• Salads</li> <li>• Green leafy vegetables</li> <li>• Seasonal vegetables</li> <li>• Soups</li> <li>• Salads</li> <li>• Local Fruits and Fresh Fruit juices</li> <li>• Dry Fruits and oil seeds</li> <li>• Milk curd and Paneer</li> <li>• Eggs and Fish</li> </ul>	<ul style="list-style-type: none"> <li>• Cold Drinks and Packaged Juices</li> <li>• Sherbets</li> <li>• Chips</li> <li>• Chocolates and Toffee</li> <li>• Pastries and patties</li> <li>• Pani Pooori</li> <li>• Maggi</li> <li>• Ready to use soups</li> <li>• Pizza, Burgers and Fries</li> <li>• Samosa, kachori</li> <li>• Namkeens</li> <li>• Tea and Coffee</li> </ul>

For easy understanding to the patient, sample menu of diet were provided to the parents as per age, which is as follows<sup>(10)</sup>

**Sample Menu for Children 4-6 years:**

**Table no:1**

Early Morning	Banana Milk Shake	250 Cal
Breakfast	1 idli with chutney or veg sandwich using 1 slice bread or 1 small katori dalia	145 Cal
Mid Morning	1 medium sized fruit/ half serving of nuts	60 Cal
Lunch	Salad+ Green Leafy Vegetable + Curd or Raita + 1 chapatti with ghee or veg pulav + Raita	350 Cal
Evening	1 seasonal fruit	60 Cal
Dinner	Mix Veg + Dal + 1 chappati/ rice or Veg Khichadi	320 Cal
Post Dinner	1 glass milk	190 Cal

**Sample Menu for Children 7-9 years**

**Table no:2**

Early Morning	1 glass milk + 4 almonds or 1 walnut	235 Cal
Breakfast	1 veg paratha with chutney or 2 idli fried with veggies or veg sandwich using 2 slice bread	225 Cal
Mid Morning	1 medium sized fruit	60 Cal
Lunch	Green Leafy Vegetable+ Curd or Raita+Dal/ Egg Curry + 2 chapattis with ghee	480 Cal
Evening	1 seasonal fruit	60 Cal
Dinner	Salad+ Mix Veg + Dal + 2 chappati/ rice or Veg Khichadi	480 Cal
Post Dinner	1 glass milk	190 Cal

**Sample Menu for Children 10-12 years (Girls)**

**Table no:3**

Early Morning	1 glass milk + 1 Banana+ 1 walnut	295 Cal
Breakfast	3 idlies+ peanut chutney or Paneer sandwich/ Egg Sandwich+ green chutny or 2 methi paratha with curd	395 Cal
Mid Morning	1 medium sized fruit	60 Cal
Lunch	Dal Palak+ Seasonal veg +Raita+ 2 chapattis or Veg Dalia + Raita	470 Cal
Evening	1 cup milk +Jaggery murmura laddu or Gajar halwa 1 serving	195 Cal
Dinner	Salad+ Mix Veg + Dal/ Fish curry + 2 chappati/ rice	430 Cal
Post Dinner	1 glass milk	190 Cal

**Sample Menu for Children 10-12 years (Boys)****Table no:4**

Early Morning	1 glass milk + fruit+ 4 almonds	295 Cal
Breakfast	2-3 Aalu Paratha+ curd or veg sandwich+ chutney	335 Cal
Mid Morning	1 medium sized fruit	60 Cal
Lunch	Seasonal veg+ Curd/ Raita+ Dal/ Chicken Curry + 3 chapattis/2 chapattis+ Rice	550 Cal
Evening	1 cup milk + roasted Chana dal / 2-3 ps Dhokla	205 Cal
Dinner	salad+ Mix veg+ Dal palak+ 3 chapattis/1 chapatti with Rice	550 Cal
Post Dinner	Fruit Custard	165 Cal

**Sample Menu for Children 13-15 years (Girls)****Table no:5**

Early Morning	1 glass milk+ 1 Banana+ 1 walnut	295 Cal
Breakfast	3 idlies+ peanut chutney or Paneer sandwich/ Egg Sandwich+ green chutney or 2 methi paratha with curd	395 Cal
Mid Morning	1 medium sized fruit	60 Cal
Lunch	Dal Palak+ Seasonal veg + anar Raita/ Pineapple raita + 2 chapattis or Veg Dalia + Raita	560 Cal
Evening	1 glass milk +Jaggery murmura laddu or Gajar halwa 1 serving	325 Cal
Dinner	Salad + Mix veg + Dal/ Fish curry+ 3 chapattis/Rice	545 Cal
Post Dinner	1 glass milk	190 Cal

**RESULT-**

Data was statistically analyzed by using appropriate tests. “Student’s paired T test” for individual group and “unpaired T test” for intergroup comparison were used for parametric data. For non-parametric data “Wilcoxon matched-pairs signed ranks test” was used for individual group and “Mann Whitney ‘U’ statistical test” was used for intergroup comparison.

**BIOCHEMICAL IMPROVEMENT PROFILE-****Table no:6**

S.N o.	Investigation	Mean			Relief %	S.D.	S.E.	“t”	“p”	Result
		BT	AT	X						
1.	<b>S. Cholesterol</b>	165.27	157.87	7.40	4.47	7.385	1.907	3.881	0.0017	V.S
2.	<b>S. Triglyceride</b>	123.20	117.13	6.067	4.92	5.688	1.469	4.131	0.0010	V.S
3.	<b>HDL</b>	45.16	47.00	-1.84	4.07	1.667	0.430	4.275	0.0008	E.S
4.	<b>LDL</b>	97.72	94.86	2.86	2.92	4.051	1.046	2.740	0.0159	S
5.	<b>VLDL</b>	23.30	22.83	0.46	1.97	2.932	0.757	0.616	0.5475	N.S

Very significant results were shown in reducing S. Cholesterol and S. Triglyceride level while results were extremely significant in reducing HDL level and also significant results were found in reducing LDL level but results are not significant in reducing VLDL level.

**ANTHROPOMETRIC IMPROVEMENT PROFILE-****Table no:7**

S.N o.	ANTHROPO METRY	Mean			Relief %	S.D.	S.E.	“t”	“p”	Result
		BT	AT	X						
1.	<b>Body Weight</b>	49.86	47.60	2.26	4.53	0.703	0.181	12.475	0.0001	E.S
2.	<b>BMI</b>	24.40	22.93	1.46	5.98	0.743	0.191	7.643	0.0001	E.S
3.	<b>Body Fat Percentage</b>	27.71	25.45	2.56	9.23	1.136	0.293	7.689	0.0001	E.S

Extremely significant results were shown in reducing Body weight, BMI and Body Fat Percentage

**CLINICAL IMPROVEMENT PROFILE-****Table no:8**

S.N o.	Lakshana	Mean			Relief %	S.D.	S.E.	“t”	“p”	Result
		BT	AT	X						
1.	<b>Chala Sphika Udara Stana</b>	1.20	0.73	0.46	38.33	0.639	0.165	16	0.01	S

2.	<i>Alasya Utsahahani</i>	1.26	0.73	0.53	42.06	0.639	0.165	4.58	0.01	S
3.	<i>Kshudra Swasa</i>	0.86	0.46	0.40	46.51	0.507	0.130	5.29	0.01	S
4.	<i>Nidradhikya</i>	0.80	0.60	0.20	25.00	0.414	0.106	9.025	0.1	N.S
5.	<i>Swedadhikya</i>	0.60	0.46	0.13	21.66	0.351	0.090	6.859	0.1	N.S
6.	<i>Daurgandhya</i>	0.53	0.33	0.20	37.73	0.414	0.106	9.53	0.1	N.S
7.	<i>Ati Pipasa</i>	0.40	0.26	0.13	32.50	0.351	0.090	8.366	0.1	N.S
8.	<i>Ati Kshudha</i>	0.86	0.33	0.53	61.62	0.639	0.165	8.366	0.01	S

Significant results were shown in grading parameters of *Chala Sphika Udara Stana*, *Alasya / Utsahahani*, *Kshudra Swasa* and *Ati Kshudha* while Non significant results were found in *Nidradhikya*, *Swedadhikya*, *Daurgandhya* and *Ati Pipasa*.

#### DISCUSSION-

*Sthaulya* which is a *Rasa Nimittaja Vyadhi* as well as *Sleshmaja Nanatamaja Vyadhi* and has been also considered under the *Santarpanotha* disorders i.e disease due to improper and over nourishment. Present study has been planned to break the pathogenesis of the *Sthaulya* by administration with strict dietary instruction with low caloric diet, although plenty of causative factors are attributed for development of *Sthaulya* or obesity. Counselling of the child in the present study played significant role in withdraw all possible causative factors, and list of food beverages to be taken with interval and daily activities to be done has been provided.

As we know, pathology of *Sthaulya*, *Ati Santarpana* wheel around intake of *Ati Singdha*, *Ati Madhura* and *Medo Vardaka Ahara* which leads to accumulation of the fat in the body. Practice of *Matravath Ahara laxana*, i.e rules of food intake, by avoiding *Pramitashana*, *Samasana*, *Vishamashana*, *Adhyashana* etc are practically explained with clear cut guide line to follow. Concept of complete and balanced food. Hence strict dietary instructions were given the study regarding do and don'ts with regards to food, with more focus on heavy food materials

with less caloric value and fibres rich diet (*Guru cha Apatarpana*) and predominantly *Vatahara Annapana* has worked out and shown significant results.

Further providing a proper schedule of food intake with enough exercise helps to fulfil the aim of study. Child and parents were encouraged to involve in different activities with physical exercise like dancing, skipping, cycling, swimming etc. Further attempt has been made to avoid mechanical life style with busy schedule, like school, home work, T.V watching, readymade fast food etc. Mean while sufficient efforts has been done create self awareness about the severity of the disease in future regarding its complication as children are unaware of complications ahead and may be reluctant to withdraw certain junk food, sweetish items, and sedentary life etc. Hence life style modification and caloric food (by providing diet chart as per age) has definitely shown significant results as role of diet, exercise, caloric food in the management of Obesity is obvious and proved in this study.

#### CONCLUSION-

Hence it is concluded that in this present study patients treated with caloric diet as per age and

dietetic and life style modification has definitely shown significant results, thus highlighting importance of diet, exercise in effective management of *Sthaulya* (Childhood obesity). Further, study may be conducted on the same with large sample size for longer duration to explore the effective therapeutics.

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