

## STUDY OF *STHOULYA* (OBESITY) AND ITS *HETUS* WITH SPECIAL REFERENCE TO *MEDOVAHA SROTAS DUSHTI* IN ADOLESCENTS

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### ABSTRACT

**Introduction-** Ayurveda has included *Atisthula* (obese or overweight) person in *Ashta Nindatiya Purushas* (undesirable physiques). They are more prone to chronic diseases like heart disorders, Diabetes, hypertension, Stroke and Cancers. **Aim-** To study the *sthoulya* and its *hetus* with special reference to *Medavaha Srotas Dushti*. **Objectives-** 1. To study different *hetus* associated with *sthoulya*. 2. To assess the *lakshanas* of *Sthoulya* in adolescents. **Material & Methods-** Participants in the adolescent age group between 10 to 19 years with classical sign and symptoms of *sthoulya* were randomly selected. **Results-** out of 100 study subjects, 61 % were male and 39 % were female. Out of total subjects, *atibhojana and madhur ahara sevan* was prevalent in 36.06 % boys and 41.2% of girls, while *atibhojana and snigdha ahara* was preferred by 32.78% 30.76 % boys and girls respectively. **Discussion-** Adolescents are usually habitual of *awyayama* and *diwasvapana*, leading to *Tridosha Dushti* – mainly *Samana Vayu, Pachaka Pitta*, and *Kledaka Kapha*. Out of these *tridoshas*, *kapha* is predominant to vitiate *medovaha srotas* due to abnormal fat metabolism causing *sthoulya*. **Conclusion-** Prevalence of obesity is nearly same in adolescent boys and girls, while proportion of preobesity is higher in boys as compared to girls.

**Key words:** *Hetu, Medovaha Srotas dushti, Tridosha, Adolescent, Preobesity, Sthoulya.*

### INTRODUCTION

Ayurveda has included *Atisthula* (obese or overweight) person in *Ashta Nindatiya Purushas* (undesirable physiques). They are more prone to chronic diseases like heart disorders, diabetes mellitus, high blood pressure, stroke and few types of cancers. Ayurveda describes *Medavaha srotas* as one of the *srotas*, also it has mentioned seven basic body tissues (*Dhatus*) i.e. *Rasa, Rakta, Mamsa, Meda, Asthi, Majja, and Shukra*

*Dhatus. Meda*, fat or adipose tissue, is one of the seven dhatus.<sup>[1]</sup> *Sthoulya is Meda and Mamsa vikara pradhana Santarpanajanya Vyadhi*<sup>[2],[3]</sup> Obesity has emerged as one of the global health problems with 200 million school-aged children world-wide categorized as being overweight/obese, of which 40-50 million are obese.<sup>[4]</sup> The factors attributing to increasing childhood obesity are increased intake of high-calorie foods that

are low in vitamins, minerals and micronutrients coupled with decreased physical activity.<sup>[5]</sup> This may have major implications towards increasing prevalence of non-communicable disease (NCD) like diabetes, hypertension and cardiovascular disease in early adulthood.<sup>[6], [7]</sup> Metabolic and cardiovascular risk factors continue in adult life from childhood leading to higher morbidity and premature mortality.<sup>[8]</sup> World Health Organization (WHO) defines adolescents as young people aged 10-19 years. Currently, nearly one fifth of the global population consists of adolescents, i.e. 1.2 billion. Also, their numbers are found to be on the rise. Many habits acquired during adolescence will last a lifetime.<sup>[9]</sup> *Sthoulya* is the abnormal and excess accumulation of *meda dhatu*. Frequent and excess intake of *kapha* increasing factors, sedentary life style, lack of mental and physical exercise are the most common etiological factors. *Sthoulya* can also occur due to *Beeja dosha*<sup>[10]</sup> i.e. hereditary cause. Overweight and obesity are strongly associated with certain types of diets, such as those that include large amounts of fats, animal-based foods and processed food-stuffs.<sup>[11]</sup> As obesity is a major risk factor for many severe disease like diabetes, cardiovascular diseases, cancers etc; it has been seen that with the dietary regime, various lifestyle measures *Sthoulya* is not controlled effectively. Considering the increasing prevalence of obesity in adolescent age group, this study has been carried out to find out the hetus associated with *ssthoulya* with special reference to *Medovaha Srotas Dushti* generated due to abnormal fat metabolism.

**AIM:** To study *Sthoulya* (Obesity) as a life-style disease with special reference to *Medovaha Srotas Dushti*.

## OBJECTIVES

1. To assess the *lakshanas* of *Sthoulya* in adolescents age group.
2. To study different *hetus* associated with *Sthoulya*.

## MATERIAL & METHODS

**Study design-** Descriptive Cross Sectional study

**Study place-** All the patients attending the Out Patient Department in the dept. of Kayachikatsa in our institute.

**Study tool:** The patients with classical sign and symptoms of *Sthoulya* i.e. *Meda vaha srotas* were randomly selected and interviewed irrespective of their age, gender, religion, education, occupation, etc by using a proforma consisting of all the relevant points from Ayurvedic and modern view for proper diagnosis and assessment of the study subjects.

**Selection of patients:** The participants of either sex in the adolescent age group between 10 to 19 years were selected.

### Method of data collection-

**Sample size** – Minimum of 100 patients of either sex were randomly selected for the study after fulfilling the inclusion criteria.

### Inclusion criteria –

- Patients of either sex between the age group of 10 to 19 years.
- *Sthoulya* diagnosed according to the classical features like *Ati Sweda*, *Alasya*, *Ayasa Swasa* etc.
- Patient with Body Mass Index  $\geq 25$  kg / m<sup>2</sup>.

### Exclusion criteria-

- Subjects not fulfilling the inclusion criteria.
- Subjects having associated conditions like cardiovascular diseases, Diabetes and Cancer.

- Subjects having obesity due to endocrinal or genetic abnormalities.
- Subjects having fissure, fistula and hemorrhoids.

**Diagnostic criteria-** Diagnosis will be made on the basis of height, weight and BMI.

Height was measured in centimeters (cm) using a stadiometer. Weight was measured in kilograms (Kg) using a standardized weighing machine. Body mass index (BMI) was calculated using the formula weight (Kg) divided by height in square meters (m<sup>2</sup>). For adolescents, overweight and obesity are defined using age and sex specific normograms for body mass index (BMI).

**Ethical considerations-** Study was conducted after getting the clearance from Institutional Ethical Committee. Informed consent was obtained before starting the study.

**Statistical Analysis-** The collected data were entered into MS Excel spreadsheets for analysis. Categorical variables were presented as frequency & percentages. Appropriate tables and graphs were depicted & explained wherever necessary.

### OBSERVATIONS & RESULTS

**Table 1: Study subjects as per their characteristics associated with Sthoulya. (n = 100)**

Characteristics		Boys		Girls	
		Frequency	Percentage	Frequency	Percentage
<b>Age</b>	10-19 yrs	61	61	39	39
<b>BMI*</b>	Pre-obese	57	93.4	32	82.05
	Obese	4	6.50	7	17.94
<b>Physical activity**</b>	Yes	22	36.06	13	33.33
	No	39	63.93	26	66.66
<b>Personal Dietary History</b>	Veg	36	59.01	24	61.53
	Non-Veg	19	31.14	12	30.76
	Mixed	6	9.83	3	7.69
<b>Takes Junk*** / fast food frequently</b>	Yes	45	73.77	32	82.05
	No	16	26.22	7	17.94
<b>Family history of Obesity</b>	Yes	38	62.29	28	71.79
	No	23	37.70	11	28.20
<b>Family history of Diabetes</b>	Yes	23	37.70	12	30.76
	No	33	62.29	27	69.23

**Veg-** Vegetarian, **Non-veg-** Non vegetarian

**Note-**

**\*BMI- Overweight-** consists of the two categories i.e. Preobese- BMI 25.00- 29.99, & Obese- more than 30.00

**\*\* Physical activity-** was assessed using the average hours

of daily routine house work and regular walking.

**\*\*\*Junk food-** Pizzas, Pastas, Burger, Bakery products, Cheese, Butter, Overfried oily items.

The subjects in our study were adolescents between the age of 10 years and 19 years. Out of total 100 study subjects, 61 % were

male and 39 % were female. The mean age of the subjects was 16.21 years (Average deviation 0.8316). The proportion of obesity was much higher among the adolescents specially among the girls (17.94 %) as compared to boys (6.50%); while 93.4 % boys and 82.05 % girls were pre-obese. Among the subjects, 62.29 % and 69.23 % boys & girls were habitual of sleeping in afternoon. Out of total subjects studied, only 36.06 boys and 3.33 % girls were involved in any type of physical activity regularly. Ready-made Junk or fast food eating habit other

than the home based food is proportionately higher in girls (82.05 %) as compared to boys (73.77 %). When asked about family history of obesity, 71.79 % girls have given the history of their parents being obese. When asked to boys, 62.29 % of them were saying that their parents are obese. Out of total subjects, 37.70 % boys and 30.76 % girls have given positive history of having Diabetes Mellitus diagnosed in their parents.

**Table 2: Study subjects as per the Medovaha Srotas Dushti Lakshana.(n = 100)**

<i>Medovaha Srotas Dushti Lakshanas</i>	Boys		Girls	
	Frequency	Percentage	Frequency	Percentage
<i>Ati Swed</i>	26	42.62	14	35.89
<i>Alasya</i>	22	36.06	17	43.58
<i>Ayasen Swasa</i>	6	9.83	5	12.82
<i>Hastapadtal Daha</i>	4	6.55	2	5.12
<i>Mukhmadhurya</i>	3	4.91	1	2.56
<b>Total</b>	61	100	39	100

Out of total study subjects, *atiswed lakshana* was found in 42.62 % boys and 35.89 % of girls, while *alasya* was most commonly seen in 43.58 % girls and 36.06 % of boys. *Mukhmadhurya* was found to be the least common *lakshana* observed only in 4.91 % and 2.56 % of boys and girls respectively.

**Table 3: Study subjects as per the hetus associated with Sthoulya.(n = 100)**

<i>Hetus</i>		Boys		Girls	
		Frequency	Percentage	Frequency	Percentage
<i>Aharaja Nidana</i>	<i>Atibhojana</i>	13	21.31	6	15.38
	<i>Atibhojana &amp; Snigdha Ahara</i>	20	32.78	12	30.76
	<i>Atibhojana &amp; Madhur Ahara</i>	22	36.06	16	41.02
	<i>Guru &amp; Sheeta Ahara</i>	6	9.83	5	12.82
<i>Viharaja Nidana</i>	<i>Awayama</i>	39	63.93	26	66.66
	<i>Diwaswapna</i>	22	36.06	13	33.33
<i>Manasa</i>	<i>Achinta</i>	42	68.85	27	69.23

<b>Nidana</b>	<b>Harshaniyatwat</b>	19	31.14	12	30.76
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Table no. 3 shows classification *hetus* under *Aharaja*, *Viharaja* and *Manasa nidan*. It was observed that, out of total study subjects, *atibhojana* and *madhur ahara sevan* was prevalent in 36.06 % boys and 41.2% of girls, while *atibhojana* and *snigdha ahara* was preferred by 32.78% 30.76 % boys and girls respectively. *Guru & sheeta ahara* was the least commonly preferred *aharaj* type by both the sexes. *Awayama* was observed in 63.93 % boys and 66.66 % girls while *divaswapna* was the common habit seen in 36.06 % boys and 33.33 % of the girls. In *Manas nidan*, *achinta* was found in 68.85 % of boys and 69.23% of girls.

## DISCUSSION

Out of total 100 study subjects, 61 % were male and 39 % were female. The mean age of the subjects was 16.21 years. Goyal R. K. et al have found that recent studies in India and other countries revealed obesity is becoming a growing health problem among children and adolescents, especially in urban populations, these findings were also consistent with our study.<sup>[12]</sup> We have selected adolescents age group for the study, as in this age group people tends to have *diwasvapana* and *awayama*, which leads to *Tridosha Dushti* – mainly *Samana Vayu*, *Pachaka Pitta*, and *Kledaka Kapha*. Out of these *tridoshas*, *kapha* is predominant to vitiate *medovaha srotas* due to abnormal fat metabolism leading to *Sthoulya*. The proportion of obesity was much higher among the adolescents specially among the girls (17.94) as compared to boys (6.50); while 93.4 % boys and 82.05 % girls were pre-obese. Goyal R. K. et al showed that the prevalence of overweight was high among

children, 14.3% in boys, 9.3% in girls. The obesity was seen in 2.9% of boys and 1.5% of girls which was inconsistent with our study.<sup>[12]</sup> Among the subjects, 62.29 % and 69.23 % boys & girls were habitual of sleeping in afternoon. Out of total subjects studied, only 36.06 % boys and 3.33 % girls were involved in any type of physical activity regularly. Readymade Junk or fast food eating habit other than the home based food is proportionately higher in girls (82.05) as compared to boys (73.77). Present study findings are consistent with Goyal R. K. study findings showing that body mass in children is influenced by the sleeping habit in afternoon, lack of physical activity and overconsumption of fast or junk food i.e. pizzas, pastas, burger, bakery products, cheese, butter, over fried oily items. When asked about family history of obesity, 71.79 % girls have given the history of their parents being obese. When asked to boys, 62.29 % of them were saying that their parents are obese. Out of total subjects, 37.70 % boys and 30.76 % girls have given positive history of Diabetes Mellitus diagnosed in their parents. Thus, in present study it was found that prevalence of pre-obesity and obesity was higher in children with family history of diabetes and obesity. In the present study, As per the *Aharaja Nidana*, most of the subjects were taking *Ati bhojan along with ati-madhur and ati snigdha ahara* leading to vitiation of *Doshas*. *Awayama* and *diwaswapna* were observed as *Viharaja Nidana* and *achinta* in *manas nidan* in most of the patients. Family history of obesity is found in most of the study subjects. *Atiswed and alasya* were the most common *lakshanas* observed in both the sexes. Faulty

dietetic habits, sedentary lifestyle, disturbed sleeping pattern, etc. are the leading etiological factors.

## CONCLUSIONS

1. This study showed that the overall prevalence of obesity is nearly same in adolescent boys and girls whereas the proportion of pre-obesity is higher in boys as compared to girls.
2. *Sthoulya is due to Medovaha Srotas Dushti due to abnormal fat metabolism.* Faulty dietary habits and sedentary life style and *diwaswapna* are the etiological factors responsible for *Dosha Dushti* resulting in *Sthoulya*.
3. Positive family history, physical inactivity were the major risk factors associated with vitiation of pre-obesity status in adolescents.
4. Dietary advice on healthy food habits and regular physical activities for children are the key options to combat increased prevalence of obesity; early *Pathyapathya* plays an important role in the prevention of *Sthoulya vyadhi*.

**Scope of future research:** Large representative sample size should be included to confirm our observations and generalize the findings to the overall population other than the present sample population.

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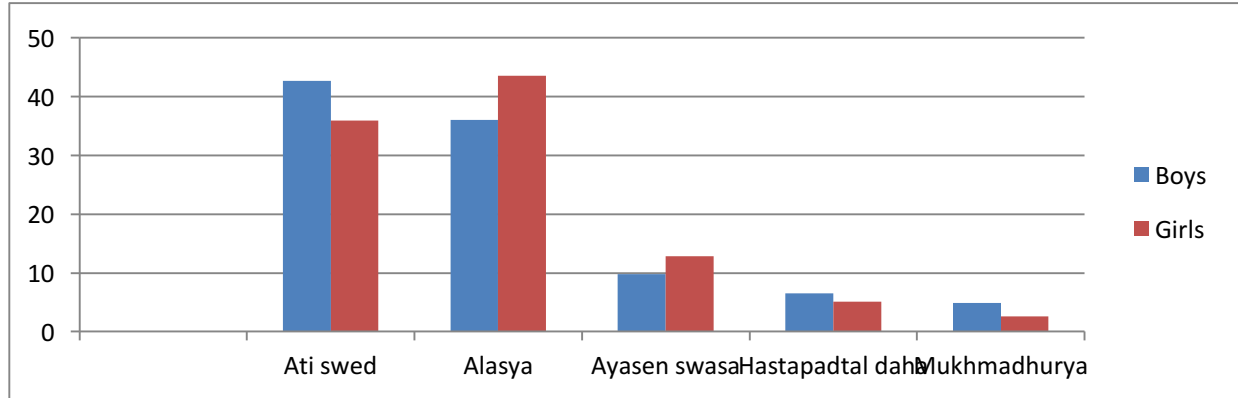
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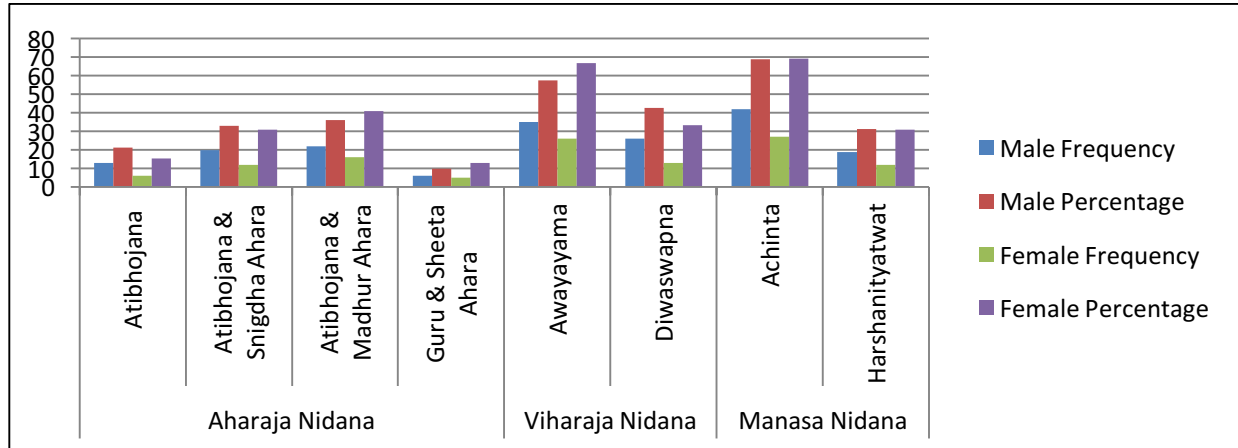
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**Figure-1. Study subjects as per the Medovaha Srotas Dushti Lakshana.**



**Figure-2 Study subjects as per the hetus associated with Sthoulya**



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