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 (Dhatu) i.e. Rasa, Rakta, Mamsa, Meda, Asthi, Majja, and Shukra Dhatu. Meda, fat or adipose tissue, is one of the seven dhatus. Sthoulya is Meda and Mamsa vikara pradhana Santaranpanjanya Vyadhi. 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. The factors attributing to increasing childhood obesity are increased intake of high-calorie foods that

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are low in vitamins, minerals and micronutrients coupled with decreased physical activity.\[5\] This may have major implications towards increasing prevalence of non-communicable disease (NCD) like diabetes, hypertension and cardiovascular disease in early adulthood.\[6\], \[7\] Metabolic and cardiovascular risk factors continue in adult life from childhood leading to higher morbidity and premature mortality. \[8\] 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.\[9\] 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 \[10\] 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 foodstuffs.\[11\] 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 sthoulya with special reference to Medovaha Srotas Dushti generated due to abnormal fat metabolism.

**AIM:** To study Sthoulya (Obesity) as a lifestyle 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 strotas 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, Ayasen Swasa etc.
- Patient with Body Mass Index $\geq 25$ kg/m$^2$.

**Exclusion criteria**-

- Subjects not fulfilling the inclusion criteria.
- Subjects having associated conditions like cardiovascular diseases, Diabetes and Cancer.
• Subjects having obesity due to endocrin- 
al or genetic abnormalities.
• Subjects having fissure, fistula and hem- 
orrhoids.

**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 
(m²). For adolescents, overweight and obe-
sity are defined using age and sex specific 
normograms for body mass index (BMI).

**Ethical considerations-** Study was con-
ducted after getting the clearance from Insti-
tutional Ethical Committee. Informed con-
sent was obtained before starting the study.

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

**OBSERVATIONS & RESULTS**

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

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

Veg- Vegetarian, Non-veg- Non vegetari-

an

Note-

*BMI- Overweight- consists of the two cat-
egories 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, Bak-
ery 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.(\( n = 100 \))

<table>
<thead>
<tr>
<th>Medovaha Srotas Dushti Lakshanas</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>Ati Swed</td>
<td>26</td>
<td>42.62</td>
</tr>
<tr>
<td>Alasya</td>
<td>22</td>
<td>36.06</td>
</tr>
<tr>
<td>Ayasen Swasa</td>
<td>6</td>
<td>9.83</td>
</tr>
<tr>
<td>Hastapadatil Daha</td>
<td>4</td>
<td>6.55</td>
</tr>
<tr>
<td>Mukhmadhurya</td>
<td>3</td>
<td>4.91</td>
</tr>
<tr>
<td>Total</td>
<td>61</td>
<td>100</td>
</tr>
</tbody>
</table>

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.(\( n = 100 \))

<table>
<thead>
<tr>
<th>Hetus</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>Aharaja Nidana</td>
<td>13</td>
<td>21.31</td>
</tr>
<tr>
<td></td>
<td>Atibhojana &amp; Snigdha Ahara</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Atibhojana &amp; Madhur Ahara</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Guru &amp; Sheeta Ahara</td>
<td>6</td>
</tr>
<tr>
<td>Viharaja Nidana</td>
<td>Awayama</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Divwaswupa</td>
<td>22</td>
</tr>
<tr>
<td>Manasa</td>
<td>Achinta</td>
<td>42</td>
</tr>
</tbody>
</table>
Table no. 3 shows classification he-tus 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.\cite{Goyal} We have selected adolescents age group for the study, as in this age group people tends to have di-waswapana and awayayama, which leads to Tridosha Dushti – mainly Samana Vayu, Pachaka Pitta, and Kledaka Kapha. Out of these tridoshas, kapha is predominant to vitiation 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.\cite{Goyal} 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 snigda ahara leading to vitiation of Doshas. Awyayama and di-waswapna 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 lifestyle and divaswapna 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 *Pathyapathy* 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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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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