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MEDOROGA IN PEDIATRICS: A REVIEW.

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ABSTRACT-

Obesity is a metabolic disorder mainly caused by excessive fat accumulation, no exercise or very less exercise, increased BMR & over intake of calories. In Ayurveda it can closely be related with Medorog. Obesity is generally observed in elder patients, but due to some genetic, environmental factors or eating habits it is now seen in pediatric age group also. There is a very fine difference between overweight & obesity. In developing countries like India, obesity is becoming major cause for maximum cardiovascular disorders, HTN, Diabetes & sedentary lifestyles. Hence it's very important to identify the potential patients or babies who can suffer from obesity in future, to give them a better lifestyle & build a healthy nation. This article focuses on discussing different aspects of obesity/medorog according to modern science & ayurveda along with their management.

KEYWORDS :- OBESITY, OVERWEIGHT, STHAULYA, BMI, IBW, MEDOROG

INTRODUCTION:

What's a healthy weight? Healthy weight definition may defer from individual to

individual. It may also defer from gender & age perspective. What's a healthy weight for one person, could be obesity/overweight for another person. Hence we have developed a



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standard parameter for defining obesity/overweight. This parameter is well known as Body Mass Index (BMI)^[5] & is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m^2). Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health.

EPIDEMIOLOGY OF OBESITY^[5].

- Worldwide obesity has nearly tripled since 1975.
- In 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese.
- 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese.
- Most of the world's population live in countries where overweight and obesity kills more people than underweight.
- 38 million children under the age of 5 were overweight or obese in 2019.
- Over 340 million children and adolescents aged 5-19 were overweight or obese in 2016.

AIM AND OBJECTIVES:

- To study medorog in pediatrics according to ayurveda & modern science in detail.
- To study different aspects of medorog viz pathophysiology, causes, types, management etc.

REVIEW OF DISEASE :-

MODERN VIEW:

DEFINITION^[6]- Accumulation of excess body fat.

Adults

For adults, WHO defines overweight and obesity as follows:

- overweight is a BMI greater than or equal to 25; and
- obesity is a BMI greater than or equal to 30.

For children, age needs to be considered when defining overweight and obesity.

Children under 5 years of age^[8]

The child is overweight if the BMI is 85-95 percentile for age & gender & is obese if BMI is more than 95 percentile.

Children aged between 5–19 years^[5]

Overweight and obesity are defined as follows for children aged between 5–19 years:



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- overweight is BMI-for-age greater than 1 standard deviation above the WHO Growth Reference median; and
- obesity is greater than 2 standard deviations above the WHO Growth Reference median.

Types of obesity^[7]- (a) Android obesity-apple shaped (b) Gynecoid obesity-pear shaped

How child obesity is caused- Excessive intake of high Calorie food, Lack of Exercise, Sedentary lifestyles, Over weight Parents

Etiology Of Obesity^[9]-

A) Endogenous Cause

1. Genetic
2. Endocrine

B) Exogenous Cause

1. Genetic
2. Environmental Factors
3. Dietary Factors
4. Neurochemical factors
5. Malnutrition

Disorders Causing Obesity :-

A) Endogenous Cause

1. Genetic:

- Down's Syndrome
- Turner Syndrome
- Prader Willi Syndrome
- Alstrom Syndrome
- Carpenter Syndrome
- Cohen Syndrome
- Laurence Moon Biedl
- Biemond Syndrome
- Frohlich Syndrome

2. Endocrine Cause

- Cushing's Syndrome
- Hypothyroidism
- Hyperinsulinism
- Pseudohyperparathyroidism
- Acquired hypothalamic syndrome

B) Exogenous Cause

1. Genetic:

- Strong Correlation between child's
- body weight and biological parents
- Resting energy expenditure



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- genetically determined
- no. of genes shown to be involved
e.g leptin gene mutation (leptin-appetite)

3. Environmental Factors :-

- In first year- Duration of feeding, Age of introducing solid foods
- Vigorous feeding
- Sedentary lifestyle
- TV viewing- lowers metabolic rate, increases caloric intake

3. Dietary Factors

- Gorging promotes weight gain
- High calorie dense foods

4. Neurochemical factors- Insulin, neuropeptide Y, dopamine, monoamines, serotonin, gut hormones.

5. Malnutrition- Prenatal malnutrition predisposes to obesity- altered development of hypothalamus and sympathetic system.

Practical approach of obesity in Paediatrics –

What to look for ?

1. Anthropometric Measurements

- a) Ideal Body Weight – It is calculated as, $IBW (Kg) = 22.5 \times \text{height} (m^2)$

Body weight	Condition
Less than IBW by 10%	Underweight
More than IBW by 18%	Overweight
More than IBW by 20%	obesity

- b) BMI – weight in kg /height (m²)



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In adults	In children
BMI- >25 is overweight	BMI- 85 th to 95 th centile for age is overweight
BMI- >30 is obese	BMI- >95 th centile is obese

c) **Weight for height** = $> 120\%$ - Obese

d) **Skin fold thickness** = measured over subscapular, Biceps & triceps region

$> 85^{\text{th}}$ percentile - abnormal

2. Fat distribution - Generalized / truncal

- Accumulation of fat in neck & trunk – Excess cortisol
- Buffalo hump – Cushing syndrome
- Reduced rate of linear growth in children with obesity- GH def., Hypothyroidism, cortisol excess, genetic syndrome.

3. Facies - coarse facies- hypothyroidism

moon facies – Cushing syndrome

4. Congenital malformations –

Polydactyl – Alstrom syndrome

Hands & feet are short – Prader-Willi syndrome

5. Secondary sex characters – GR & pubertal development delayed in hypothyroidism & cortisol excess.

6. Systemic examinations-

Hepatosplenomegaly – Glycogenosis

Generalised hypotonia – Prader-Willi syndrome

Which investigations is to be done?

1. Blood glucose fasting & pp
2. Lipid profile
3. Karyotyping
4. Adrenal function
5. GH Assay
6. Thyroid hormones
7. Sr. Ca, P & Parathormone level



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8. MRI of brain

MANAGEMENT :-

For prevention of obesity we should plan proper diet as per the requirement-

1. Calorie requirement^[10]

AGE	Kcal/day
1 -2 yrs	1200
4 -5 yrs	1690
12 – 13 yrs	2050
13 – 14 yrs	2400

- 50 -60 % - calories should come from Carbohydrates
- 20 – 30 % - calories from fats

2. Proteins – 0.8-1 gm/kg/day

APPROACH^[9]-

1. Diet
2. Exercise
3. Behaviour modification
4. Lifestyle modification
5. Drugs / pharmacotherapy
6. Surgery – Gastric & intestinal bypass surgery , laproscopic gastric binding
7. Health education and counselling

AYURVEDIC VIEW :- *STHAULYA*^[11]

मेदोमांस अति वृद्धत्वात् चलस्फिक् उदर स्तन :
|

अथवा उपचय उत्साहो नरो अतिस्थूल उच्यते ||

च.सु.२१/०९

When excessive as well as abnormal growth of *medodhatu* along with *mamsa dhatu* is found in a person which result into pendulous appearance of buttocks, abdomen and breast called as *atisthaulya*.

Obesity- *Medoroga*

1. Obesity is regards as *Medoroga* - a disorder of *Meda Dhatu*

2. “*Sthaulya*” - ‘*Santarpan janya vikar*’ – a over nutritional disorder

• *Sthaulya* Anatomical description of the disease

• *Medorog* Physiological part of disturbance (Imbalance)

STHAULYA NIDANA –

“तत् अतिस्थौल्यम् अति सम्पूर्णाद गुरु मधुर शीत स्निग्ध उपयोगात्



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अव्यायामात् अव्यवायात् दिवास्वप्नात्
हर्षनित्यत्वात् अचिंतनात् बीज

स्वभावात् च उपजायत्”^{[[12]}

च.सु.२१/४

मेदसा आवृत्त मार्गत्वात् वायु कोष्ठे विशेषतः ।

चरण संधुक्षयत्यग्निम आहार शोषयत्यपि^{[[19]}

च. सु. २१/०५

SIGNS & SYMPTOMS –

अतिस्थूलस्य तावदायुषो ह्रासो जवोपरोध

कृच्छ्रव्यवायता दौर्बल्य दौर्गन्ध्य स्वेदाबाध :

क्षुदतिमात्र पिपासातियोगश्चेती भवन्ति

अष्टदोषाः^{[[12]}

च.सु. २१/०४

Decrease sexual maturity rate (SMR),
exhaustion, excess perspiration, foul body
odour, excess hunger, excessive thirst,
gasping for air, snoring.

AYURVEDIC MANAGEMENT OF STHAULYA-

Charaka	Sushruta	Vagbhata
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Guru apatarpan aahar ^[13]	Virukshan chedan	Langhan
Vaataghna annapaan ^[18]	Lekhan basti ^[14]	Guru apatarpan ^[15]
Ruksha ushna tikshna basti ^[18]		Medo anil shleshmaa haranaam ^[16]
Langhan rukshan ^[17]		

Multidimensional approach-

1. To increase the Metabolic rate
2. Aama production is treated
3. Aggravation of Vata
4. Clearing the Channel blockage
5. Exercise

DISCUSSION:

There is difference in adult & child obesity in terms of assessment, clinical findings, laboratory, as well as in management of theoretical interventions . Not all hefty children come under obesity and may not be growing to obese adults. Disciplined dietary habits & lifestyle play major role in



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preventing obesity in children. Playing electronic gadgets at home is becoming a common cause which is the most preventable in children. Treating obesity in children is not easy because of inherent inclination for food at that age. Proper history in terms of endocrine, metabolic and genetic should be taken into consideration. Ghrelin is a hunger hormone which secreted when stomach is empty & secretion stops when stomach is stretched; in the same principle probably the ayurvedic concept of *Guru apatarpana* might be relevant. When *ahara* with *guru guna* is given stomach will distend and feeling of satiety happens; and due to *apatarpana* further fat storage and weight gain will be prevented.

CONCLUSION:

Maintaining *Agni* in proper state & form, being *Agni* is the nodal factor in maintaining health & disease which is inter influencable. Type of diet, Form of diet, Time of diet, Frequency of diet. In simple terms *shadarasatmak aahar, shada aaharparinamkar bhavas* and *asht aahar vidhivisheshaytan* are everything in balancing *Agni*. For us the right diet means at least one ingredient from following *aahar vargas* like *shimbi, shaak, fal, krutanna* etc. We hesitate to recommend single or simple drug for treating obesity as it has least role in directly reducing it To counter the comorbidities of obesity the only & only way is to increase the physical activity Neither to eat less or more, eat well.

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