

NAMSCON 2018

CME ON
THE RISE OF
NON-COMMUNICABLE DISEASES

CHILDHOOD OBESITY IN INDIA

CURRENT SCENARIO AND FUTURE DIRECTIONS



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Obesity – an epidemic-1988



World Health Organization



Definition of Obesity

BMI

Overweight: 85th – 95th percentile

Obesity: >95th percentile

IOTF: Correspond to adult equivalent BMI 25, 30

IAP: BMI 23, 27

BMI is a measure of fatness (Fat X Fat free mass)

Spuriously high in muscular children; less in tall child.

Definition of Obesity

Waist circumference

WHR ratio

More accurate indicators:

Intra abdominal adipose tissue accumulation → increased risk for cardio-metabolic risk

Recent studies in adults

Age-specific ref. values are not available for all the age groups



Prevalence of child overweight & Obesity

IOTF

200 million now

268 million by 2025

USA:

7% in 1980

Every 3rd child is
overweight or obese



Prevalence of child overweight & Obesity

India (meta-analysis of
42 studies):

16% in 2001

19.3% in 2010

Urban >rural

High SES > Low SES

Boys > Girls





Causes for Obesity

Causes for Obesity

Genetic

Endocrine

Environmental

Causes for Obesity

Genetic

9 loci - Mendelian obesity

58 loci - Polygenic obesity

Bardet-Biedel Syndrome



Endocrine causes for Obesity

Hypothyroidism

Typical facies

Short stature

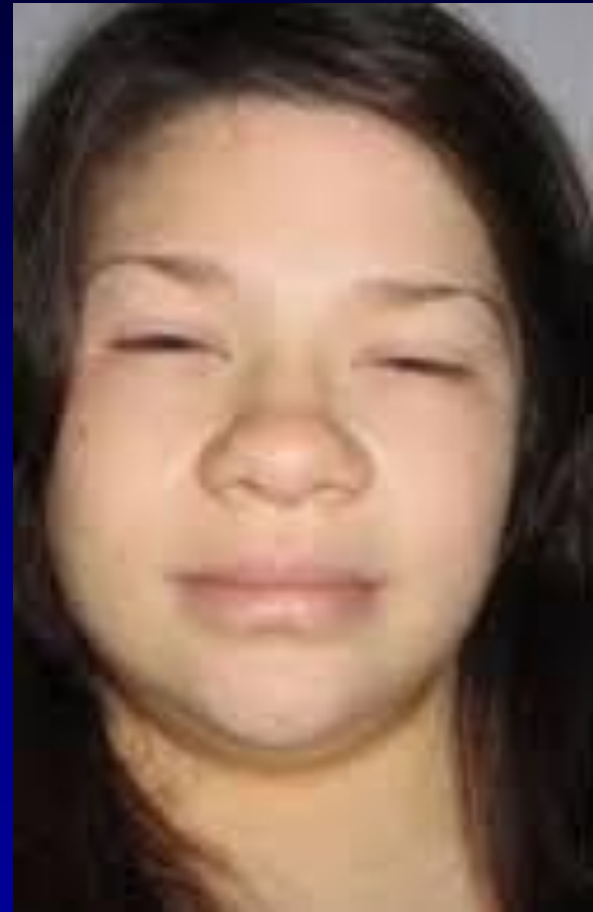
Constipation

Fatigue

Dry skin

Depression

Irregular and/or heavy menstrual periods



Endocrine causes for Obesity

Cushing syndrome

Moon facies

Buffalo hump (prominent supraclavicular and dorsal cervical fat pads)

Striae

Slender distal extremities and fingers



Endocrine causes for Obesity

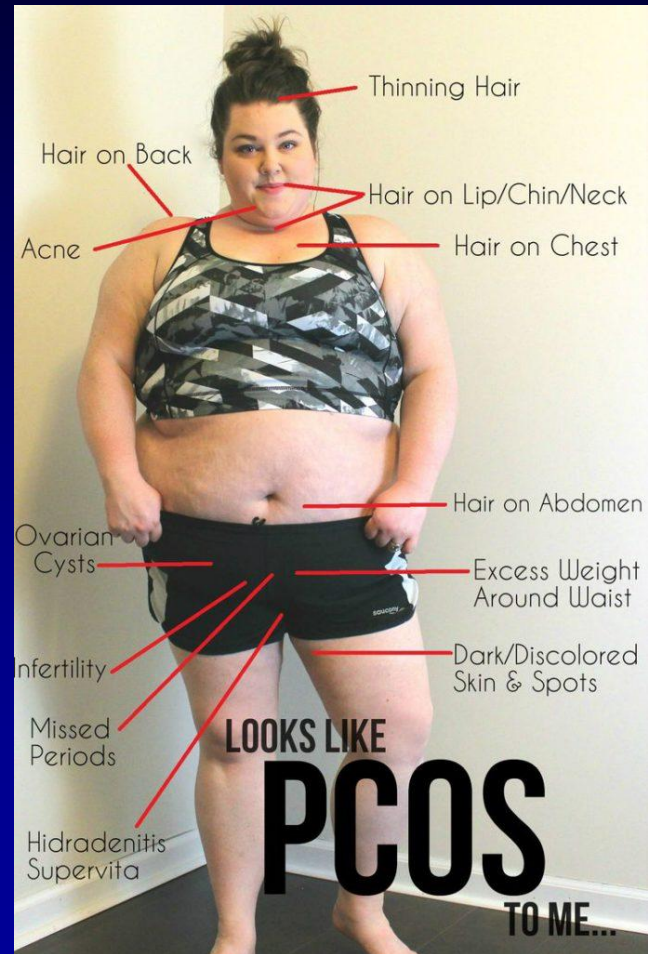
Polycystic Ovarian syndrome

High androgen levels

Acne

Irregular periods

Abdominal fat excess



Endocrine causes for Obesity

Hypothalamic obesity

Fast weight gain
(10-20 kg in one year)

Hypothalamic dysfunction
(palpitation, hypertension,
hyperhidrosis)

Signs of ICT



Causes for Obesity

Environmental

Energy dense foods

Forced feeding

False traditional beliefs

Energy expenditure is less:

Strict academic routine

Less availability of space

Less number of peer group



Causes for Obesity

Non-nutritional cause, in an adolescent:

Assessment of growth velocity < 25th percentile

Bone age delay by > 2 years

Cycles of menses are irregular even after 1 year of menarche

Dwarfism (Short stature)

Extra digits

Focal Neurological deficit

Genitalia hypoplastic

Hypertension (>99th percentile)

Impairment of vision

Comorbidities of Obesity

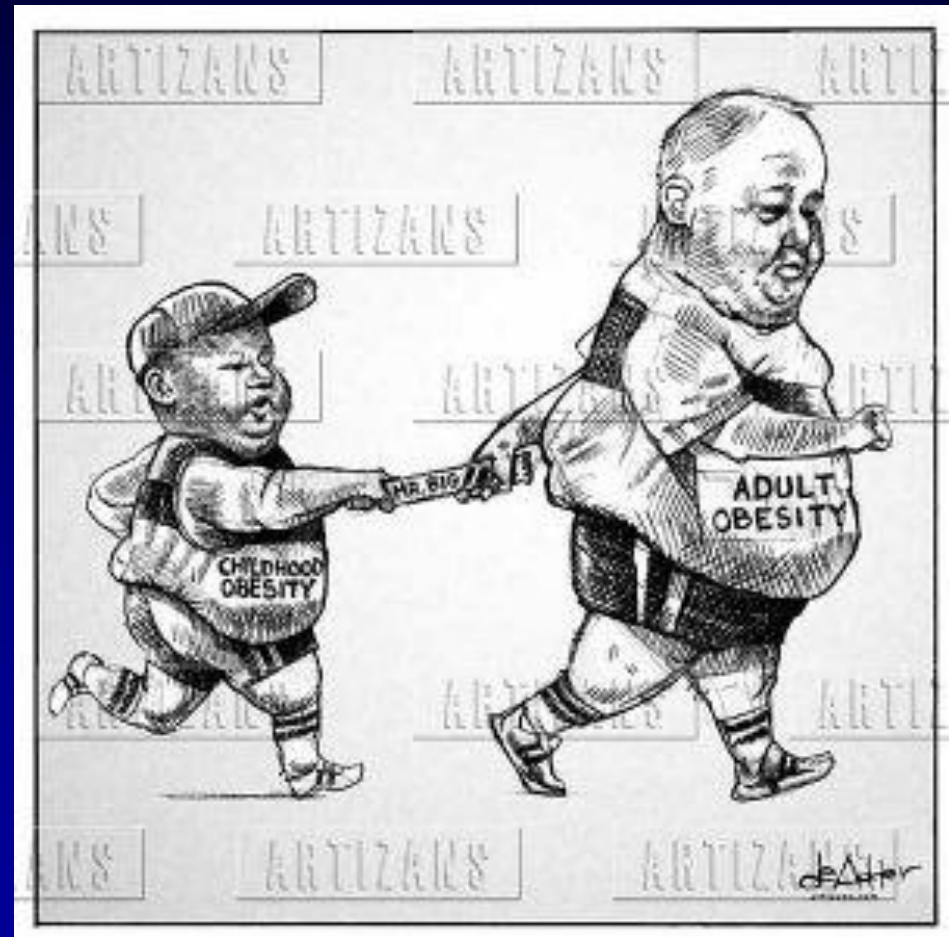


Co-morbidities of overweight & Obesity

Childhood obesity leads to adult obesity:

69%

Risk is even more if + in adolescence.



Co-morbidities of overweight & Obesity

Sleep:

REM sleep is less

Obstructive sleep apnea

Behavioral problems:

Poor self-esteem

Depression

Externalizing
symptoms.



Co-morbidities of overweight & Obesity

Hypertension:

Cohort study in USA:

>85th percentile, risk is
Quadrupled.

Chennai: 5 times risk

France:

Proposed theory:

Leptin, derived from
adipose tissue →
influences sympathetic



Co-morbidities of overweight & Obesity

Type-2 Diabetes:

Fasting insulin levels more

Insulin resistance is more
(HOMA-IR)

Potential to develop T2DM



Co-morbidities of overweight & Obesity

Metabolic syndrome:

Hypertension

Insulin resistance

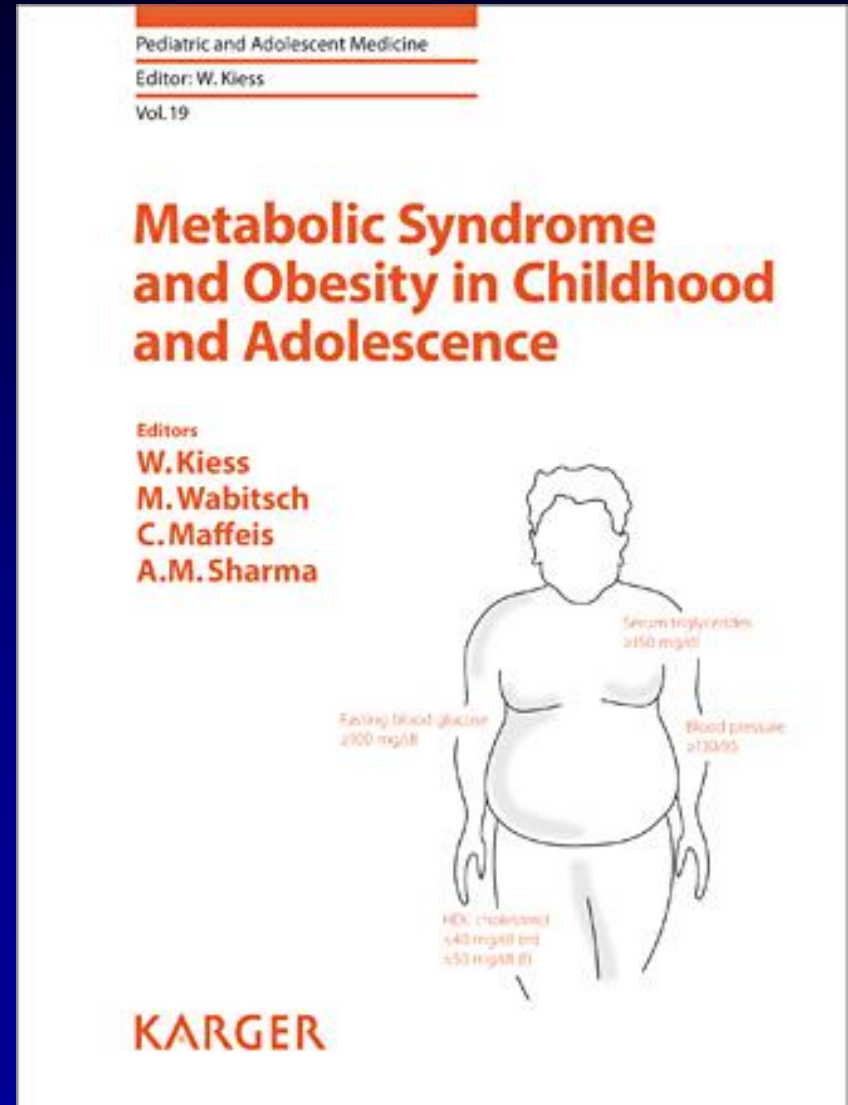
Dyslipidemia

Israel (1 million children)

Australia

Bogulusa heart study

German study : BMI > 97th
percentile: 40% are at risk



Co-morbidities of overweight & Obesity

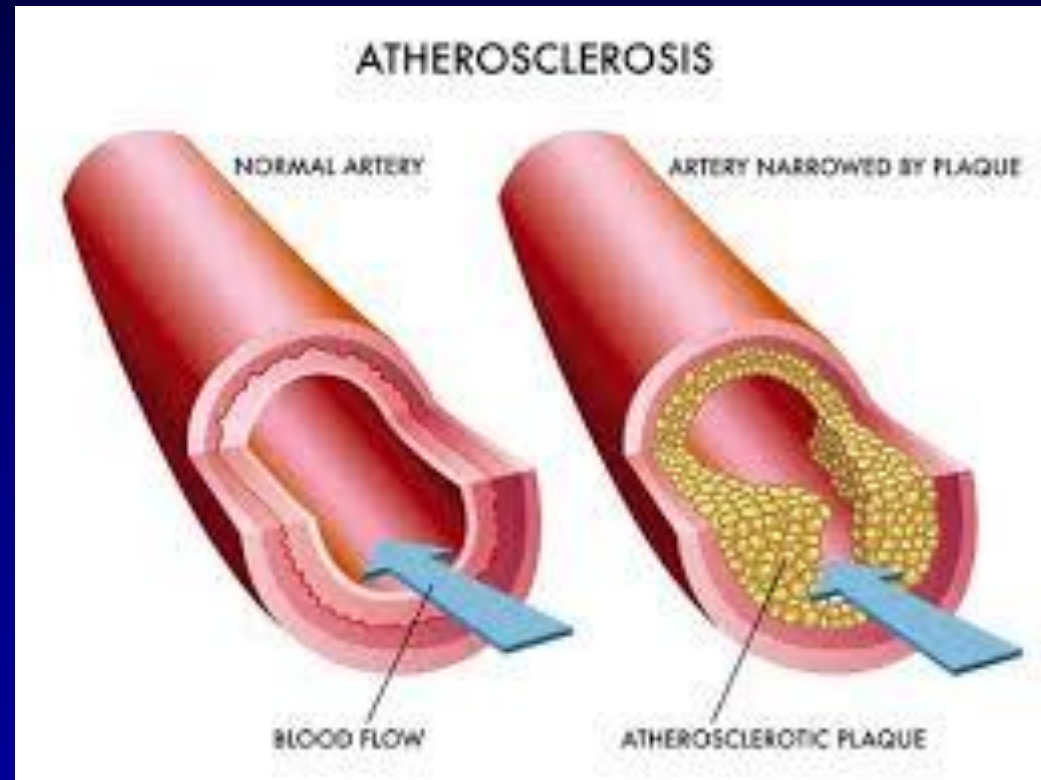
Endothelial dysfunction &
risk of early
atherosclerosis:

South Indian Study:

Chemical markers:
MDA, FRAP, NO

High levels of fibrinogen

Triglycerides, VLDL



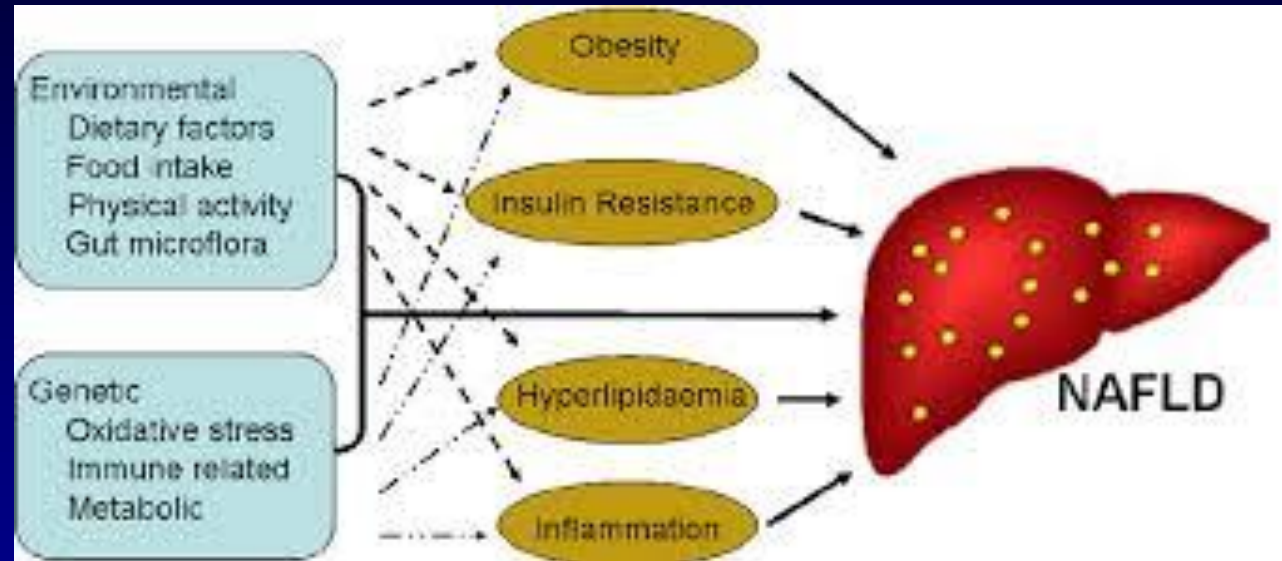
Co-morbidities of overweight & Obesity

Others:

NAFLD

GERD

Slipped capital
femoral epiphysis



Co-morbidities of overweight & Obesity

Premature mortality:

32 years follow-up

If BMI >25 at 18 years

More likely to die in the 20 years



Co-morbidities of overweight & Obesity

12 million: Impaired GT

04 million: Type 2 DM

27 million: High BP

38 million: NAFLD



What India has to do now?



What India has to do now?

Assess the true burden:

Community & School
based surveillance

Health facility: screen

Growth monitoring



What India has to do now?

Role of health facilities

Formulate uniform guidelines: Diagnosis & management

Encourage Research

Health workers-Training
Qualified counselors



What India has to do now?

Interventions at school

Physical activity

Unhealthy foods at Cafeteria

Nutrition – curriculum

Counseling as a group



What India has to do now?

Interventions at home

Role model

Healthy eating

Physical activity

Restricted TV viewing

Restricting junk foods



What India has to do now?

Government's role

Parks, play grounds

Bicycle tracks

Fruits & vegetables



What India has to do now?

Government's role

Junk food – Injurious to health



Conclusion

Conclusion

Childhood Obesity - epidemic proportions

True burden of the problem

Sensitize the public

Train the health personnel

Multi-disciplinary life style intervention

Thank you



Treatment of Obesity - Target

Age in years	Minimum aim	If possible aim for
2- 11 years	Try to maintain weight	Weight reduction of 0.5 kg / month
12-18	same	1kg/week

<2: no target is defined so far

No compromise should be on growth

Aetiopathogenesis-Diet plan

DISC – Dietary Intervention Study for children

Carbohydrate	Fat	Protein	Fiber	Others
60%	30% MUFA: 11% PUFA: 9% SFA: <8% Cholesterol not more than 150 mg/day	15%	(Age in years +5) g/day	Less salt Less sugar

The above regimen actually applies for >8 yrs

But, it is more or less same for even < 8 years

The above regimen is achieved with: 6 servings of whole grain;
5 servings of fruits and vegetables; 3 servings of low fat milk
/dairy products (per day)

Treatment- Pharmacological

Name	Mechanism of action	Side effects	In whom it is not preferable
Sibutramine	Serotonin noradrenaline reuptake inhibitor- thereby increasing satiety	Increase in heart rate & BP	Children who already have HT
Orlistat (only drug, FDA approved for use in <16yr)	Pancreatic lipase inhibitor; increases fecal fat loss	Malabsorption (ADEK loss) diarrhoea, gall bladder disease	Children who already take low fat diet
Metformin	Helpful to combat glucose tolerance also; hence preferred for children with impaired GT & PCOS		

Pharmacotherapy is only second line management; considered only when insulin resistance, impaired GT, hepatic steatosis, dyslipidemia, or severe mental dysfunction persist despite life style modifications

Treatment- Pharmacological- Ref: Nelson: 2016

Other approved drugs for adults:

Phenteramine (noradrenergic) + Topiramate (GABAergic)

Leptin + Amylin (decreases food intake + slow gastric emptying)

Lorcaserin (Serotonic receptor agonist)

Treatment- Bariatric Surgery

Indications:

BMI>40, complete or near complete skeletal maturity (>13 years in girls & >15 years in boys), presence of a medical complication resulting from obesity + 6 months of multi-disciplinary weight management program has failed

Procedure of choice:

Roux-en –Y gastric by pass / adjustable gastric banding

Complications: small bowel obstruction, incisional hernias, weight gain, vitamin def, micronutrient def,

Need life long follow-up.

Prevention

Intervention should start from NB period:

Individual:

Less calories, less fat; less sugar; less portion

More fruits, more vegetables,

Eat breakfast regularly

Limit screen time < 2 hours

More physical activity (brisk walking for 1 hour)

Community:

school, parks, walk and cycle paths

Physician:

Role models, regular enquiries, monitor during routine visits

Acceptable lipid profile

Total cholesterol in mgs%	LDL in mgs%	Triglycerides in mgs%	HDL in mgs%	Comment
<170	<110	<150	>35	Normal
170-199	110-129			Borderline
>200	>130			elevated

Diet management

- a) **High fiber:** age in years + 5 = grams of fiber /day
- b) **Good amount of fruits and vegetables:** plant stanols and sterols lower the dietary absorption of cholesterol.
- c) Intake of **trans fatty acids** to be limited to **<1%** of total calories.
- d) For high risk group: **saturated fat <7% & cholesterol intake <200 mgs%**

The shape of things to come

