

PAEDIATRIC OBESITY BEYOND NUTRITION

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Defination

- ▶ Maladaptive increase in mass of somatic fat stores relative to lean body mass
- ▶ Energy intake $>$ expenditure

Obesity measurements

- ▶ Weight, WFH z-score, weight: hip ratio, Tricep -skin fold thickness- not sensitive picking at risk population for adiposity related morbidities.
- ▶ Direct measure: hydrodensitometry & dual energy x-ray absorptiometry DEXA,-not feasible in clinical practice




- ▶ BMI–surrogate marker of obesity
- ▶ Unlike adults, definition based on age–gender specific BMI percentiles
- ▶ 85–95th centile= at RISK of obesity
- ▶ >95th =OBESITY

Pietrobelli et al, J paed 1998, Reilley, int J Obes Relat Metab Disord, 2000. Expert panel, Am J Clin Nutr 1998, WHO



Epidemiological determinants and Trends

- ▶ Socio-demographic factors; urban > rural, LES > rich, regional variations, ethnicity
 - ▶ Genetic factors
 - ▶ Prenatal undernutrition–LBW,SGA–increased risk of adiposity related diseases and obesity. Birth weight inversely relates to waist: hip ratio and visceral adipose tissue volume .(evidence– winter hunger observation by Ravelli et al)
 - ▶ Theories–Thrifty phenotype hypothesis
–Catch up growth hypothesis
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- ▶ Prenatal overnutrition; LGA association with childhood body fat deposition and risk of adult obesity (schaefer et al, Gillmans et al, 2005–7)
- ▶ Postnatal nutrition; 1. BF up to 4 mo, confers 20–30% reduction of obesity up to adolescence but does not prevent adult obesity. 2. Age of specific food introduction or composition –no influence on adult obesity.



TRENDS

- ▶ Worldwide prevalence increased from 4.2% in 1990 to 6.7% in 2010.
- ▶ Expected to reach **9.1%** or 60M, in 2020.
- ▶ Estimated prevalence in Africa in 2010 was 8.5% and is expected to reach **12.7%** in 2020.
- ▶ Kenya ,prevalence of 4–6.9% on preschool 2–5(6)yr (Gewa, 2010;wandia 2014).25.6% in school going children in Nairobi (Aballa, ku

Global prevalence and trends of overweight and obesity among preschool children

Mercedes de Onis, Monika Blössner, Elaine Borghi.

American Journal of Clinical Nutrition 2010;92:1257–64.

Why current global epidemic

- ▶ Nutritional transition: High caloric dense foods/soft drinks –easily available, cheap, low taxation, supersizing, lots of adverts
- ▶ Rural –urban migration effects:– , taking public transportation instead of walking ,few side walks etc, playing indoors, neighborhood safety, less exercise, access to a greater number unhealthy food choices,
- ▶ Sedentary life style–television, computer games, play stations
- ▶ Improved pre/postnatal care, improved survival of IUGR, increasing pool of obese children
- ▶ Poor adherence to Breast feeding guidelines, unhealthy flour composition



Putative explanations

- ▶ Disruption of endocrine functions by addition of artificial aromatase inhibitors
- ▶ Environmental endocrine disruptors, increased time spent on thermo-neutral environments(heaters, air conditioners)
- ▶ Increased use of pharmaceuticals agents which promote weight gain (antihistamines, antidepressants etc)
- ▶ Inadequate sleep duration



From Traditional food to Modern Meals



From Traditional to Modern Snacking

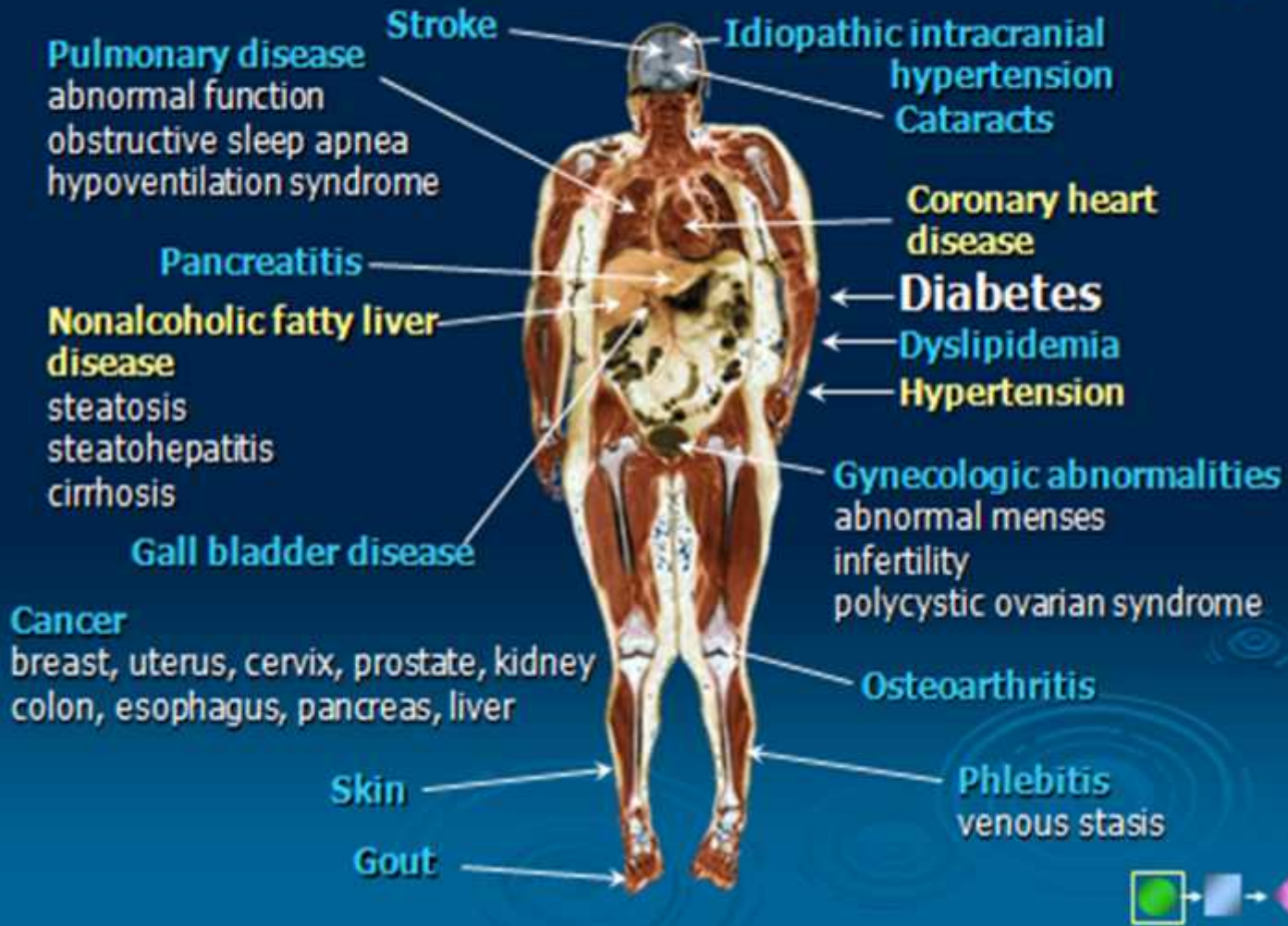


Whats the concern with Obesity

- ▶ More than 1 in every 4 world children are affected.
- ▶ Childhood obesity is increasing even in poorer countries
- ▶ Risk of persistence to adult obesity.(freedman 2005, Guo2002, Whitlock 2005)
- ▶ Metabolic syndrome and IRS is prevalent in obese adolescents in same degree as in adults
- ▶ Obesity is 4X common than malnutrition in some developing countries
- ▶ Simultaneous malnutrition and obesity coexist



Health Complications of Obesity



Causes of Childhood Obesity



Pathological causes

Genetics



Socioeconomic

Childhood obesity

Behavioral


Nutritional



Clinical approach to an obese child

- ▶ Detailed hx/Ex: to identify current obesity related morbidities, birth history or family history suggesting such risk. Dietary hx, exercise, sedentary lifestyle assessment etc
- ▶ **Assess for discriminating phenotypes–genetic obesity syndromes**
- ▶ Anthropometry: h/wt velocity curves, BMI
- ▶ Investigations determined by presentation
- ▶ Any child regardless of weight, whose 1st degree relative suffers: obesity, DM type2, HTN, Hyperlipidaemia, premature MI, BMI > 85 to be considered at risk for adiposity morbidity.

Treatment decisions


- ▶ Persistence risk of child obesity to adulthood increases with age from 2yr
 - ▶ **<2yr:** caloric restrictions should not be used because of less risk of persistence and higher risk of treatment associated statural or brain growth.
 - ▶ **>2yr** offer treatment if: **family hx of obesity or obesity related morbidity as well as child + family co-operation.** Aim to decreasing or eliminating weight growth while allowing height growth at age/gender specific velocity
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- ▶ If statural growth not possible or BMI 95%, or adiposity related morbidity present—aim at therapeutic weight reduction.
- ▶ If HTN/ DM present aim to reduce weight or body composition within 1 year to point where symptoms ceased.
- ▶ Severe adiposity eg pickwickian syndrome or psychiatric related symptoms warrants a more rapid programme entailing aggressive weight reduction measure—dietary and exercise



Treatment options

Dietary interventions;

- ▶ aimed at 300–400kcal/day below weight maintenance requirements as per dietary hx formula relating anthropometry to energy expenditure (e.g Harris Benedict)
 - ▶ Heart healthy: 55%carb, 30% fat, 15% prot
 - ▶ Substitute water for high calorie sugar drinks
 - ▶ Encourage fruits and vegetables
 - ▶ Reduction of meals prepared outside homes
 - ▶ Parental support and supervision.
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Therapeutic exercise–

- ▶ Discourage sedentary lifestyle–TV, games, commuting
- ▶ Promote vigorous/moderate physical exercise for 1 hour.



Surgical interventions

- ▶ Only indicated in extreme obesity (pickwickian) with serious morbidity in whom all other interventions have failed. Long term follow up is needed.
- ▶ Common procedure: gastric bypass, vertical banded gastroplasty and adjustable gastric banding



Pharmacotherapy

- ▶ Many drugs not recommended for <16yrs, only orlistat is FDA approved for 12–16yrs, works by reducing dietary fat absorption by 30%.
- ▶ Recommended dosage 120mg tid for 1yr
- ▶ Effect in weight reduction modest hence not beneficial in severe obesity.
- ▶ Side effects; oily stools, gallstones, pancreatitis, abnormal liver enzymes, etc



Conclusion

- ▶ Childhood obesity has already reached epidemic proportions
- ▶ Childhood obesity leads to adult obesity
- ▶ The epidemic fueled by nutrition transition, is maintained by many other factors beyond nutrition.
- ▶ Prevention is critical; healthy dietary practices, regular physical activities, advocacy in food policy for children, Government involvement.



Thanks for your attention

Questions???

