

The Increasing Threat of Type II Diabetes in Obese Children and Adolescents

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•Introduction to Obesity

- ◆ Obesity contributes to about 300,000 deaths/year
- ◆ Epidemic in the US
- ◆ In 1990 cost of adult obesity in U.S. = 68 million\$
- ◆ Currently 1/3 of US population

Prevalence of Childhood Obesity

- ◆ Increase in prevalence of obese kids parallels increase in obese adults
- ◆ 1 in 5 children
- ◆ Increased 50% since 1976
- ◆ Certain ethnic groups (AA, NA, and Hispanics) at highest risk

Possible Etiology of Childhood Obesity

- ◆ Genetic, metabolic, and behavioral components
- ◆ Imbalance: Energy Intake vs. Energy Expenditure
- ◆ Increase in consumption of energy dense high fat foods
- ◆ Decrease in required school- related physical activity
- ◆ Increase in sedentary pursuits

•Commorbid Conditions

- ◆ Hyperlipidemia
- ◆ Hypertension
- ◆ **Abnormal Glucose Tolerance/Type II Diabetes**
- ◆ Early Menarche and P.C.O.D.
- ◆ Psychosocial Issues

Commorbid Conditions

- ◆ Orthopedic issues (S.C.F.E)
- ◆ Cholelithiasis
- ◆ O.S.A.
- ◆ Increased H.R. and C.O.
- ◆ Increase risk of obesity in adulthood

Diabetes in children

- ◆ Type I diabetes used to be childhood diabetes
- ◆ Today 8-45% of kids with newly diagnosed diabetes have non-immune mediated diabetes
- ◆ Other “rare” types of diabetes increasing
- ◆ Clinical presentations may be indistinguishable from Type I
- ◆ Must classify diabetes correctly to treat

Typical presentation of Type I Diabetes

- ◆ Immune-related: specific autoantibodies against β -cell components
- ◆ Low endogenous fasting insulin and C-peptide production
- ◆ Weight loss, polyuria, polydipsia
- ◆ Usually not overweight
- ◆ Short duration of symptoms
- ◆ 30-40% have ketosis at presentation
- ◆ Require insulin for survival
- ◆ 5% w/first or second degree relative with immune-mediated diabetes

Typical presentation of Type II Diabetes

- ◆ 85% are overweight or obese at diagnosis
- ◆ Usually present w/glucosuria w/o ketonuria, absent or mild polyuria/polydipsia, little or no weight loss
- ◆ 5-25% do present with ketoacidosis
- ◆ Have a family history of Type II Diabetes

Typical presentation of Type II Diabetes

- ◆ Over age 10: in middle to late puberty
- ◆ Higher frequency in females
- ◆ Acanthosis Nigricans and PCOS common
- ◆ Non-European descent (African, Hispanic, Asian, American Indian)
- ◆ **Up to 24% still misdiagnosed as having Type I**

Etiology of Early Onset Type II Diabetes

- ◆ Social, behavioral, environmental, genetic components
- ◆ Insulin resistance/inadequate β -cell insulin secretion
- ◆ Similar to proposed etiology in adults
- ◆ Initially β -cell compensates for impaired insulin action by hypersecretion of insulin
- ◆ Eventually will have failure to hypersecrete insulin

Etiology of Early onset Type II Diabetes

- ◆ Puberty: normal increased resistance to insulin results in physiologic hypersecretion but normal β -cell function
- ◆ Kids w/ genetic predisposition & environmental risk become hypersecretors before puberty
- ◆ During puberty failure to keep up w/insulin demand
- ◆ Obese kids: visceral fat may be inversely related to insulin sensitivity

Diagnosis of Childhood Type II Diabetes

- ◆ Screen kids at high risk with FBS or 2-h OGTTq2 years
- ◆ start screening at age 10 or onset of puberty
- ◆ Endocrinologist will then treat to normalize blood glucose and HBA1c

•Dangers of Childhood Type II Diabetes

- ◆ Microvascular and macrovascular complications in early adulthood
- ◆ Diabetic retinopathy, nephropathy, and neuropathy in young adults
- ◆ Early detection and intervention are key

Treatment Strategies

- ◆ Aggressive weight management and lifestyle modification
- ◆ Weight reduction: clinically, community, or home based
- ◆ Involvement of parents for long-term success
- ◆ Diet and Exercise first line therapy
- ◆ Pharmaceutical therapy: Oral agents & insulin
- ◆ Use of oral agents not formally recommended
- ◆ Treat concomitant hypertension and hyperlipidemia
- ◆ Watch for microalbuminuria, retinopathy, and foot care
- ◆ **Primary prevention** of both obesity and Type II

Community Resources (to aid in weight loss)

- ◆ Good Life™FitKids™ at NBGH/Joslin Center
- ◆ YMCA
- ◆ Endocrinology clinic for obese Type II diabetics at CCMC
- ◆ Hispanic Health Council
- ◆ ADA

Good Life Program “FitKids” NBGH

- ◆ Family-based approach to weight management
- ◆ 10 wk programs: 90 minute sessions (45min nutrition education/ behavioral modification and 45min supervised exercise)
- ◆ Registered Dietitians, and exercise specialists
- ◆ Food education
- ◆ Age groups 9-12 and 13-17
- ◆ Diabetic adolescents can work one on one with Joslin Center

CCMC Endocrinology Clinic for Obese Type II's

- ◆ Run by staff endocrinologists
- ◆ receive referrals from the pediatric community
- ◆ goals: treat medical condition as well as lifestyle modification
- ◆ Stress exercise as a necessity and refer to community centers
- ◆ Extremely hard for inner city obese kids to exercise in a safe welcoming environment
- ◆ Conducts clinical research on type II diabetes and childhood obesity

YMCA

- ◆ NB and Hartford
- ◆ No specific programs designed for weight loss
- ◆ NB: cardiostrength, basketball, and swim classes
- ◆ NB: "On Track" program
- ◆ Prices determined on a sliding scale basis
- ◆ Membership at Htfd YWCA: 15\$/yr and 1\$/use

Hispanic Health Council: Nutrition Education

- ◆ Improve health and lives of the Hispanic population in Hartford
- ◆ PANA Programa para Aprender Nutricion y Alimentacion
- ◆ Nutrition presentations at schools (kids and parents)
- ◆ Puppet shows, games and other fun tools
- ◆ Parents given culturally appropriate nutrition information
- ◆ Funded by USDA and supported by UConn dept nutrition science

ADA

- ◆ www.diabetes.org or 1-888-diabetes, local office in Meridan
- ◆ Website has info on support groups, education programs, and local events
- ◆ Also info on nutrition, exercise, treatment, latest research, legislation etc..
- ◆ UConn education series “Living with Diabetes” and others
- ◆ Nothing specifically for kids
- ◆ Closest support group in Htfd for insulin pumps