



Youth Onset Diabetes

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Youth Onset Diabetes: a New Challenge

Childhood Type 2 diabetes is not the same as Adult onset type 2. If you wait to educate parents about the risk for diabetes in weight challenged children, it is too late to reverse type 2 in adolescents.

Disclaimer: The medical community tries to be politically correct. We need patrons to return and support our practice. The truth about childhood obesity is it's an unhealthy state which can lead to chronic illnesses and sometime death in early adulthood. This article will help you understand why it is important to teach your children good daily habits and promote healthy living in young adults.

Worldwide Obesity Epidemic

Obesity is at epidemic levels worldwide. (Lascar, 2018) In the USA, one sixth of adolescents are overweight and another 33% are at risk for weight challenges before they turn 20 years old. (Schwarz, 2010) The prevalence of severe obesity is increasing dramatically in 2-19 year-olds. Severe obesity is identified in the 95-120 percentile weight for age. In adults this is recognized as morbid obesity. As of 2017 9% of girls and 8% of boys are classified as severely obese. (Daniels, 2019) Adolescents with a Body Mass Index at or above 85th percentile are medically classified as overweight. (Schwarz, 2010) Eighty percent of overweight children ages 10-15 years old are prone to becoming obese adults by age 25 years. (Schwarz, 2010) (Daniels, 2019)

The relationship of type 2 diabetes with early onset obesity is very strong. (Narasimhan, 2015) This health condition affects the ability to study and their work productivity. (Lascar, 2018) It has an adverse effect on their quality of life. (Lascar, 2018) (Kao K. , 2016)

This will affect everyone's future

Many professionals are predicting a future public health catastrophe. (Lascar, 2018) (Daniels, 2019)

One third of the young men and women applying for military service are disqualified because of obesity. (Jancin, 2018) Plus up to 71% of military applicates are disqualified based on obesity, poor physical fitness, lack of education or substance abuse. (Jancin, 2018) This can affect our

country's ability to protect itself. The repercussions ripple down into our healthcare costs as well as our nation's productivity.

Excess weight causes multiple health problems, even in young children. Up to 70% of young people diagnosed with type 2 diabetes previously had metabolic syndrome. (Kao K. S., 2016)

Five risk facts combine to make metabolic syndrome:

- Elevated blood pressure above 130/85
- Uncontrolled blood sugars or symptoms of insulin resistance
- Increased inflammation
- High triglycerides, high LDL blood fats, or low HDL blood fats
- Abdominal obesity

These conditions place individuals at higher risk for:

- Heart disease
- Fatty liver disease (NAFLD)
- Type 2 diabetes
- Strokes
- Polycystic Ovary Syndrome
- Asthma
- Sleep Apnea
- Gallstones
- multiple forms of cancer

(Beilby, 2004)

Comorbidities are often present at diagnose of type 2 in teens.

- Obesity 85-95%
- High blood pressure 36%
- High fat in blood 85%
- Kidney damage 14-22%
- Vision problems 9.3%
- Fatty Liver disease 22%
- Depression 14.7%
- Eating disorders 26%

(Kao K. S., 2016)

Children, within two years of diagnoses with type 2 diabetes, already have many of the complications from type 2 diabetes.

- Hypertension up to 65%
- Triglycerides 60-65%

- Low HDL 73%
 - Retinopathy 13.7% at 3y, 23.7% were blind by age 32.
 - Nephropathy 14-22%
 - Depression 14.7-26%
 - Sleep Apnea up to 60%
- (Kao K. S., 2016) (Narasimhan, 2015) (Associates, 2014)

Treatment Options for Diabetes in Adolescents and Youth (TODAY)

The TODAY study identified a strong familiar relationship between type 2 in children and their families. Of these children, 89.4% had a family history of diabetes with 60% of these children having a first degree relative (mother, father, sibling) that had type 2. One third of them were a product of a pregnancy with the complication of uncontrolled blood sugars. (Narasimhan, 2015)

Genetics is only one factor. This is a polygenic disorder. (Kao K. , 2016) Family customs and cultural traditions can greatly contribute to the weight problems in children. (Schwarz, 2010) Forty-three percent of children on public insurance are reported as weight challenged. (Schwarz, 2010) Unfortunately, when these children turn 18 years old, optimal care for all health screening to prevent many complications, drop off. (Associates, 2014) This may be due to the lack of health insurance.

The TODAY-2 study indicates significant complications are happening much faster than expected. Heart attacks and strokes are happening within 7.5 years of diagnoses. (Busko, 2019) Philip S. Zeitler MD PhD in pediatric endocrinology advises an aggressive medication management with these patients to help control the early development of complications. (Busko, 2019)

Ethnicity plays a key role in glycemic control and complications for diabetes. Twenty-seven percent of youth onset diabetes had HbA1c equal to or greater than 9.5%. (Associates, 2014) Minority youth, particularly Native American and Asian Pacific Islanders, had poor glycemic controls. (Associates, 2014) Hispanic and African Americans were also not well controlled. (Associates, 2014) This places them at high risk for heart attacks, blindness, and kidney dialysis. (Associates, 2014) SEARCH research suggest many youth diagnosed with diabetes will suffer debilitating complications early in life. This not only affects their quality of life but also their ability to work and their cost of health insurance. (Associates, 2014)

Early diagnoses and proper treatment are key to prevent complications. The Rise Study (Restoring Insulin Secretion Pediatric Medication Study) identified that within 12-15 months after diagnoses, beta cell function was significantly reduced. (Edelstein, 2018) Although they may first present with DKA, they will test negative for diabetes autoantibodies (GAD65 and IA2). (Associates, 2014) Many youths are started on insulin but can go through a honeymoon phase up to two years. According to the RISE study, beta cell function can drop off significantly within 12 - 15 months. (Edelstein, 2018) The TODAY study shows a decline in beta cell function

from 20-35% per year. (Narasimhan, 2015) These youths need to be monitored closely for their changing medication needs. Poor glycemic control also contributes to their risk for heart problems.

Unexpected Heart Disease in Youth

Rapid development of cardiovascular disease is also significant within this group. In youth, with every 1% increase in HbA1c above normal range, the risk for carotid stiffness increased 30%. (Narasimhan, 2015) For each year after diagnoses of type 2 in youth, the risk for carotid stiffness increased 30%. (Narasimhan, 2015) In addition to atherosclerosis, being overweight causes an enlarged heart placing them at risk for additional heart complications. (Daniels, 2019)

“If the time course of cardiovascular disease relates to diabetes (type 2) is the same for adolescents as for adults, it is anticipated that adolescents with diabetes will begin having substantial cardiovascular disease morbidity and mortality in their 30’s and 40’s.” Stephen R. Daniels, MD PhD (Daniels, 2019)

Concerning pediatric care, body mass index (BMI) coupled with waist circumference is important in predicting early onset heart problems. (Daniels, 2019) Ninety-five percent of type 2 youths had a waist circumference greater than the 90th percentile for age, sex and height. (Associates, 2014) To avoid heart problems, prevention of obesity is a far superior treatment in children. (Daniels, 2019) Dr Daniels stresses the need for exercise with improved nutrition to prevent obesity. (Daniels, 2019)

Cardio-respiratory fitness could be used to identify kids at risk for type 2 diabetes and cardiovascular disease. (Cimino, 2018) Dr Agbaje suggests using Cardio-Respiratory-Function (CRF) thresholds to identify children at risk for cardio-metabolic complications. (Cimino, 2018)

Fatty Liver Disease Often Undetected

Fatty liver disease is a significant problem with these patients. (Brunk, 2018) Non-alcoholic fatty liver disease is two times higher in teens with weight problems and insulin resistance. (Lascar, 2018) Nonalcoholic steatohepatitis (NASH) is up to 43% higher in young adults with type 2 and 34% higher in youth with prediabetes. (Lascar, 2018) Alcohol plays an important factor to consider with this age group. It is important to teach these young people the real problems with alcohol use and the risks from peer pressure.

Exercise Moderate to Vigorous

“Everyone can dramatically improve their health just by moving anytime, anywhere, and by any means that gets you moving.” Dr. Brett Giroir (Jancin, 2018)

Only 20% of American teens get the recommended physical activity. (Jancin, 2018) The weekly recommendations for physical activity for teens include:

- 150-300 minutes of moderate aerobic exercise

- 75-100 minutes of vigorous aerobic exercise
- 2 days of muscle strengthening exercise
(CDC, 2019)

The best way for a teen to accomplish these physical goals is to participate in sports. (Jancin, 2018) There are new guidelines for younger children. It is recommended that 3-5 year old's get 3 hours of activity every day. Recommendations for 6-17 year old's include:

- One hour each day of moderate to vigorous exercise every day
- Three days each week with heart building (vigorous) exercise
- Three days each week with muscle-strengthening activities
(CDC, 2019)

Regular activities can benefit brain health too. It can improve memory and thinking in preschool children. (Jancin, 2018) In children with ADHD regular physical activity can help with cognition as measured on Academic Achievement Tests. (Jancin, 2018)

Exercise needs to become a part of their daily lives. The potential benefits from cardiovascular exercises can be lost within 3-6 months of being discontinued. (Lascar, 2018) To protect from heart attacks, aerobic exercise needs to be incorporated into their daily lives. Also, exercise does not cancel poor nutrition in teens. The benefits of aerobic exercise must be coupled with proper nutrition. (Lascar, 2018)

Summary

Type 2 diabetes presents a major health crisis today and in the near future. (Rowley, 2017)

The TODAY study and the RISE study reveals type 2 diabetes in children progresses much faster than in adults over 40 years. (Narasimhan, 2015) (Edelstein, 2018) They often initially present with DKA, so it is important to properly diagnose. (Kao K. , 2016)

There is an unusually rapid progression through prediabetes within 12 months. (Kao K. S., 2016) Prediabetes is rarely diagnosed because it is without noticeable symptoms. (Kao K. , 2016)

Many risk factors for comorbidities are present at diagnoses. (Kao K. S., 2016) They will need insulin therapy much earlier than adult onset type 2.

It is important to remember biological differences within this age group. Typically, they are in moderate to late puberty. (Edelstein, 2018) Human growth hormone could significantly affect blood sugar levels. (Edelstein, 2018) Also, many of these young women will experience pregnancy and the uncontrolled blood sugars resulting. Embryo malformations are expected to increase under these conditions. It is important to teach about pregnancy prevention and encourage birth control pills when necessary.

Never underestimate the power of peer pressure. Plus, teens often feel as if they have little control over their own socioeconomic status. (Edelstein, 2018) All population health workers must address these issues with the family care givers.

Non-compliance with medications is high. Participants in the TODAY study had 57% compliance in medication after 5 years. (Narasimhan, 2015) We can only speculate teen medication compliance based on HbA1c scores. We need to motivate these teens toward better self-care.

The TODAY study's Intensive Lifestyle Program focused on healthy eating, increased activities with a personal exercise therapist and moderate weight loss. Adherence to the program dropped to 54%. (Narasimhan, 2015) Small support groups for families struggling with uncontrolled weight in children is recommended. (Hartzler, 2018) Teens need support groups that include their peers. (Lascar, 2018) Mutual respect will help reach their hearts and help motivate them to better health.

The prevention of weight problems through lifestyle interventions is key. (Rowley, 2017) (Lascar, 2018) (Edelstein, 2018) (Kao K. , 2016) If things stay the same, it is predicted that the diagnoses of type 2 diabetes will quadruple by 2050. (Associates, 2014) We all need to work together to provide a consistent message. (Hartzler, 2018) Obesity in children will result in their early deaths. (Narasimhan, 2015) (Daniels, 2019) (Brunk, 2018)

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