Type 2 Diabetes in Youth – A Road Less Travelled

Julie Halipchuk, RN RN CDE
Clinical Nurse Specialist
Diabetes Education Resource for Children & Adolescents, Winnipeg, MB

Objectives

- Discuss current trends in the incidence of Type 2 diabetes (T2D) in youth
- Identify individual factors that may influence the management of youth with T2D
- Describe an approach to the management and education of youth with T2D

Disclosure

- Conflicts of Interest
  - None

A conflict of interest exists when an individual is in a position to profit directly or indirectly through application of authority, influence, or knowledge in relation to the affairs of PENS. A conflict of interest also exists if a relative benefits or when the organization is adversely affected in any way.
Outline
- What is Type 2 diabetes in youth
  - Describe pathophysiology
- The "Road" Today
  - Population description & incidence rates
- Barriers to Health
- The Clinical Program
- Where to from here?

What is type 2 diabetes?

What is Type 2 Diabetes?
- A metabolic disorder characterised by hyperglycemia and altered lipid metabolism caused by varying degrees of insulin resistance in the context of an inability to compensate with increased insulin secretion
  - Nolan, Damm & Prentki, 2011
- Of mixed etiology with social, behavioural and environmental risk factors exposing the effects of genetic susceptibility
  - Reinehr, 2013
- U.S. diabetes related costs in 2012 were estimated at $245 billion; an increase of 41% over 5 year period
  - American Diabetes Association, 2013
Pathophysiology of T2DM

Insulin resistance

Impaired insulin secretion

Environment

Genes

High Blood Sugars

The “Road” Today

The pandemic of type 2 diabetes in adults is upon us, however we remain especially alarmed at the rapidly rising rates of type 2 diabetes in youth around the world Pettitt et al., 2014

Youth onset T2DM, also defined by hyperglycemia, is compounded by the medical complications of obesity, insulin resistance, adolescence, poverty, and family beliefs or myths Dean & Sellers, 2007

Prevalence rates of youth onset T2DM range from 2.22/1000 youth <20 years to a higher prevalence of 5.0/1000 for ages 10-19 years. Pettitt et al., 2014; Pelletier et al., 2012

The high rates of youth onset T2DM that have been documented in Manitoba garner special attention Amed et al., 2010
Pediatric T2DM in Canada 2006-2008

Manitoba - Incidence cases/year (T2D)

New Diabetes in Manitoba Children

49%
Face of Youth Onset T2DM in Canada

- Mean age: 13.2 years
- 9.7% presented before age 10
- 80% were obese
- Ethnic minorities overrepresented, though 25% were Caucasian
- 37% had at least one comorbidity at diagnosis
- 30% of moms of youth with T2D had pre-pregnancy diabetes vs. 2% of moms of those youth who did not

Ethnicity of Youth with T2D in Canada

HNF-1α G319S Polymorphism

- Private polymorphism in the Oji-Cree people
- Results is an insulin secretory defect
- Results determined with genetic blood work
Barriers To Health

What barriers exist in Manitoba?

- Remote, isolated communities; limited road access
- Limited or overcrowded housing
- High rates of unemployment, poverty, low education
- Barriers to physical activity
- Less transfer of traditional/basic life skills from parents/elders
- Increased rates of hospital admissions

Poorer quality of life Allan 2008, Hood 2014
- Depression in 10-20% Levitt 2005, Anderson 2011
- More than 65% report ≥ 1 major stressful life event in the past year TODAY 2014

SOCIAL DETERMINANTS OF HEALTH environment
parental education, income, housing, social environment
Clinical Program

The goal of our clinical program & treatment plans are to help families overcome barriers.

Pediatric T2D Clinics

- Interdisciplinary Team
  - Pediatric Endocrinologists
  - Diabetes Educators – RN & RD
  - Social Work & Psychology
  - Transition Coordinator “Maestro”
  - Dental hygiene students
- Appointments may be individual or group education or both
- Outreach clinics throughout the year
Education

Group Education
- What is Diabetes?
- Living Well with Diabetes
- Healthy Eating
- Physical Activity
- Blood Glucose Monitoring
- Insulin
- Complications
- Retinal Screening

Physical Activity
- Assess:
  - Total screen/sedentary time
  - Daily physical activity time
  - Sleep patterns
  - Include some measure of intensity
- Reduce screen time
- Set small, realistic goals
In youth with T2DM and A1C>9.0% (and/or in DKA at diagnosis) insulin therapy is initiated

- May be successfully weaned once glycemic targets are achieved, particularly if lifestyle changes are effectively adopted
- Important to address myths associated with insulin use
- Further studies are needed to discern safety & efficacy of medications that have been only studied in adults.
Complications & Co-morbidities

- Influenced by emerging evidence that suggests that complications may be more aggressive, occur earlier in youth onset T2DM
  
  Dabelea et al., Diabetes, 2008.
  Dart et al., Diabetes Care, 2014.
  Poor renal survival in youth with type 2 diabetes
  Renal Failure 4-fold higher than T1D
  Dean & Flett 2002
  Dart 2012
Where to from here?

Barriers to Health

Poverty
Food Security
Geographical
Jurisdictional
Cultural

Prevention & intervention efforts must be directed at lessening these barriers to health.

Willows, Hanley & Delormier, 2012
Addressing Financial Barriers to Health

- An inverse relationship of income to risk of youth onset T2DM is not only evident when comparing the lowest income quintile to the highest, but additionally when a linear trend test was completed. Halipchuk, 2014

Intervention studies and health care initiatives, grounded within a multifactorial socio-ecological model and directed at narrowing the economic disparity amongst these vulnerable populations are necessary.

Drugs in children with type 2 diabetes

Joining Forces: A Call for Greater Collaboration to Study New Medicines in Children and Adolescents With Type 2 Diabetes

Recruitment of pediatric patients with type 2 diabetes for clinical trials
1. Low prevalence of disease
2. Disadvantaged populations
3. Geography

Transition: The Maestro Program

- Initiated in 2002 to help facilitate transition from pediatric to adult diabetes care
  - Provide support and advocacy
  - Help navigate complex adult system
  - Assist with accessing and coordinating services
  - Building relationships

**Next steps** include continued efforts aimed at securing adult care partnerships for this vulnerable population.
Breastfeeding

- Breastfeeding has been shown to be protective when compared with formula feeding. (Halipchuk, 2014)

Could we support women with diabetes to feed their offspring breast milk exclusively while in hospital?

Next Generation Cohort

- Genetics and epigenetics
- Intrauterine environment
- Infant nutrition
- Stress & intergenerational trauma
- Growth patterns

Efforts aimed at detecting, treating and documenting the natural history of this disease has begun, but our work is far from over.
Summary

- T2DM diabetes is no longer just an adult disease.
- They are many barriers to health for these families.
- Lifestyle interventions need to be family focused & transgenerational.
- Treatment & education programs require creativity and cultural sensitivity.

Thank you for your kind attention.

References


References


