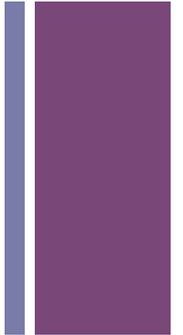


# Type 1 Diabetes and the Effects of Psychosocial Factors on Glycemic Control

National Pediatric Hospital Case Study  
Maria Tadic

3/20/2013

# + Presentation Outline



- Type 1 Diabetes: A Review
- Psychosocial factors and how they affect glycemic control in adolescents.
- Case Study of nutrition counseling for an 10 year old male in the Endocrinology Clinic
- Clinic Analysis of the patient and his ability to appropriately manage his DM1
- Conclusion and questions

# + Type 1 Diabetes: A Review

- Type 1 diabetes, also known as insulin dependent diabetes occurs worldwide and can appear at any age - even in adulthood.
  - This is the most severe type of diabetes and requires a lifelong dependence on insulin therapy for survival.
- Type 1 diabetes occurs when the body's own immune system attacks a patient's own body - specifically cells in the pancreas (islet cells) that produce insulin.
- Out of the total number of people in the US with diabetes, only 5% of them have type 1 diabetes (2)

# + Type 1 Diabetes: A Review

- The cause of type 1 diabetes is still unclear at this time. However there are many studies that suggest that there are multiple factors that may contribute to the onset of this chronic illness.
- Many of these factors include:
  - Environment
  - Genetics
  - Possible exposure to certain viruses during pregnancy and childhood (2).

# + Type 1 Diabetes: A Review

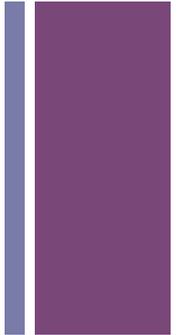
- Family history plays a significant role in the prediction of type 1 diabetes.
  - Patients with a parent or sibling with type 1 diabetes has an increased risk for developing the condition.
- Genetic studies have shown that there are certain genes that may indicate an increased risk as well.
- Also, studies between identical twins show that in addition to genetics, environment may also play a role in the onset or prediction of type 1 diabetes in children (2).

# + Type 1 Diabetes: A Review

- Infections or viruses during the gestational period have been linked to the increased risk.
  - In addition, viruses contracted during early childhood, such as Epstein-Barr virus, coxsackievirus, mumps virus or cytomegalovirus, have also been linked to an increase risk of the onset of type 1 diabetes (2).
- Other risk factors during pregnancy and early life include:
  - the mother being under the age of 25 at childbirth
  - a mother who had preeclampsia
  - being born with jaundice
  - having a respiratory infection immediately after birth (2).



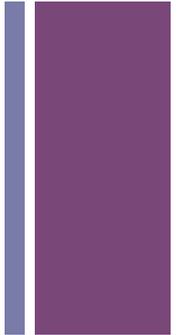
# Psychosocial Factors Affecting Glycemic Control:



- A large percentage of children diagnosed with DM1 are noncompliant with the demands required by this chronic illness.
  - This type of behavior may have a multitude of negative side effects such as DKA, neuropathy, nephropathy, retinopathy and cardiovascular disease.
  - Overall, this poor compliance can result in increased morbidity and mortality in addition to higher medication dosages.



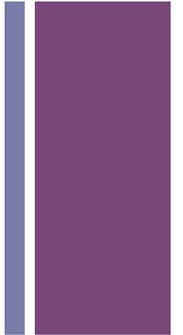
# Psychosocial Factors Affecting Glycemic Control:



- There are many psychosocial factors that affect a child's ability to effectively manage and care for their DM1.
  - Due to DM1's chronic nature, the child and their family have to manage a complex medical schedule and integrate this new schedule into their lifestyles.
- Families will need to deal with school, peer groups, culture and home life and how these are affected by a DM1 diagnosis. .



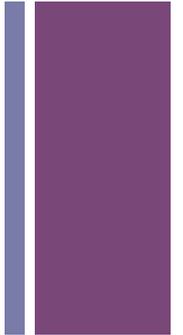
# Psychosocial Factors Affecting Glycemic Control:



- Due to the fact that many patients with DM1 are very young, they rely heavily upon their parents for proper care.
- When there is conflict and stress with the parents, it may have a negative impact on the glycemic control in the child.
- Studies have shown that parents exhibit high levels of anxiety and depressive symptoms at the time of the original diagnosis of DM1 in their child.
  - These studies have also shown a positive correlation between the increased stress in parents with poor compliance in the children.



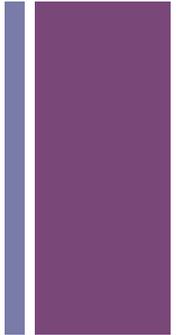
# Psychosocial Factors Affecting Glycemic Control:



- Some of the specific factors that have a large impact on the compliance with a diabetic regimen and glycemic control include:
  - parenting style
  - parent stress
  - in-home conflict
  - parent-child conflict
  - marital conflict
  - single-parent household status
  - additional behavioral disorders



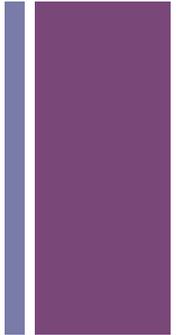
# Psychosocial Factors Affecting Glycemic Control:



- Children with DM1 may also exhibit multiple behavior problems including ADHD, depression, aggressive behavior, etc.
- Depression specifically may affect a child's ability to appropriately manage their DM1 regardless of age.
  - Children may feel helpless, have decreased energy or a lack of motivation.
- Children presenting with any of these behavior problems have been associated with an increased risk of complications and negative side effects from DM1.



# Psychosocial Factors Affecting Glycemic Control:



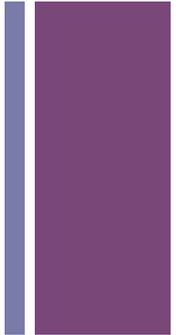
- Research on diabetes reviews the importance of educating parents on the management of their child's diabetes
  - allowing for youth to take charge of their diabetes
  - set strict boundaries about what is expected (such as mandatory daily checking of glucose levels, maintaining dietary restrictions, etc.)
- Results in better adherence and improved glycemic control in youth with type 1 diabetes.
- Registered Dietitians need to be aware of all of these factors that may affect a patient and their family's ability appropriately manage and care for a DM1 patient.



+ Case study: Type 1 Diabetes  
and the Implications of  
Psychosocial Factors on  
Glycemic Control

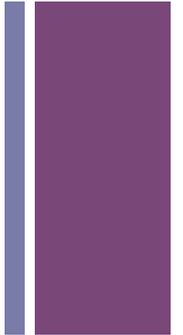
# + Subjective

- JM is an overweight 10 year old male child presenting to the Endocrinology clinic for a follow up on his DM1 management and care.
- JM was originally diagnosed with DM2 in December of 2010 when he was 8 years of age.
  - Pt's diagnosis was later changed to reflect appropriate condition of DM1.
- Pt also experienced several behavior problems, but there is no official diagnosis from psych as of November 2012.



# + Subjective

- He is present with his mother at this visit. JM seemed fatigued, not alert and uninterested in participating during the visit. His mother reported most of the new information.
- During the interview JM seemed to be hypoglycemic and the RD on staff provided him with a honey packet.
  - Patient did not really perk up, but reported feeling better.
- Patient is at nutritional risk secondary to diagnosis of type 1 diabetes.



# + Diet Prior to Admission

- Mother reported patient diet still needs to improve.
- Due to current housing situation, pt spends most weekdays with his father. He was providing JM with 2 pieces of plain bread before arriving to school in order to prevent a hypoglycemic event.
- JM's mother reported that he eats school breakfast and lunch. She has menu's at home and reports reviewing the day's choices with JM.
- Patient denies any physical activity.

# + Anthropometrics

## Anthropometrics

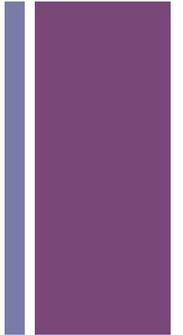
- Height: 159 cm (5'2")
- Weight: 70.5 kg (155 lbs)
  - 140% of IBW (40 kg)
- BMI: 27.5
- BMI percentile: >99<sup>th</sup>

## Growth Evaluation

- Weight trends: 11/10: 78.2 kg, 6/12: 62.8 kg, 2/13: 70.5kg
- BMI trends: **11/10** 31.5 (>99%), **6/12**: 25.2 (>99%), **2/13**: 25.4 (>99%).
- Height trends: **11/2\10**: 151cm, **6/12**: **158.7** cm, **2/13**: 159 cm



# Notable Labs and Medications:



## ■ Labs 2/13:

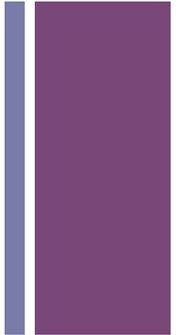
- HgA1c: 8.1%
- Low HDL: 44
- LDL: 99
- Total Cholesterol: 157
- Triglycerides: 113

## ■ Medications:

- Novolin 70/30
- Floxtina
- Strattera



# Assessment



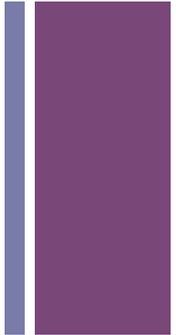
- Estimated Energy Needs:
  - **Kcals/kg** -  $47\text{kcal/kg} = 1,800 \text{ kcals/day}$
  - **Grams Protein/kg** -  $0.95\text{g/kg/day} = 66 \text{ g protein/day}$
  - **Fluid needs** -  $2,500 \text{ ml fluid/day}$
- I used IBW to calculate both kcals/kg and the RDI for protein g/kg. I used the Holiday-Segar method to determine his fluid needs.

# + PES Statements

- **Abnormal nutrition lab values** related to poor food choices and lack of food/nutrition knowledge as evidenced by an HgbA1c of 8.1%.
  - JM initially had an HgbA1c of 14% which trended down to 11.8% and finally 8.1%. He is a young patient and cannot verbalize appropriate food choices or methods to manage his DM1.
- **Overweight/obesity** related to excessive energy intake/poor food choices as evidenced by a BMI of 25.4 which is over the 99th percentile for boys his age.
  - Pt reports to endocrinology clinic with a weight and BMI both over the 99th percentile for boys his age. Mother reports JM sneaking food and making poor food choices and decreased intake of fruits and vegetables.

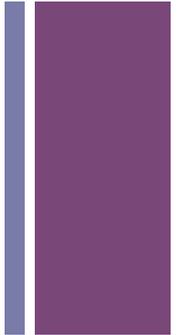
# + Plan:

- The plan is to continue to monitor for improvement in weight and physical activity as well as sneaking of food.
  - Additionally, continue to assess the patient's ability to follow and care for his DM1 on a regular basis.
  - Also continue to educate family members on how to manage JM's diabetes at home.





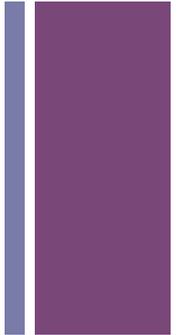
# Goals:



- 1. No sneaking food.
  - a. Encourage JM to not sneak food at school or when home alone.
  
- 2. Think about carbohydrate sources and make healthy choices.
  - b. Encourage JM and his family to continue to make healthy and appropriate food choices for his DM1. Also plan for better breakfasts and lunches while at school - continue to help JM read the school menus and plan appropriate choices.
  
- 3. Carb Amounts 40-50g/meal and 15-25g/snack.
  - a. If there are 2 breakfasts 1) have around 15g and 2) have 25-35g in order to maintain stable blood sugars throughout the day and evenings.



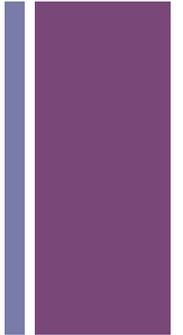
# Case Conclusion

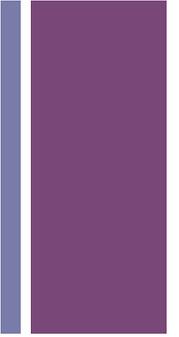


- JM has been seen in the endocrinology clinic for a few years with some changes in his labs, weight and ability to manage his DM1.
- Due to his current social situation, it is important that JM and his parents continue to come to his outpatient appointments and the educational classes provided by the clinic.
- Also, in order to effectively manage his DM1, JM needs to continue to not sneak food, make healthy food choices at home and at school.
- Lastly, his parents need to help him continue to meet the recommended carbohydrate amounts in order to maintain a stable blood sugar throughout the day and an overall HgbA1c of around 7%.

# + Discussion

- Continued research on the psychosocial factors that affect glycemic control in youth is needed. This will provide insight for clinicians on how to better manage a patients DM.
- Studies have shown a multi-faceted approach to the care and management of DM1 can be effective in promoting better glycemic control.





Questions?



# References:

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