Pediatric Case Study: Diabetic Ketoacidosis Secondary to New Onset Type I Diabetes Mellitus

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Learning Objectives

- Have an overall understanding of diabetic ketoacidosis in a pediatric patient
- Understand the role of the dietitian in a pediatric patient with new onset type I diabetes mellitus
- Examine the evidence regarding the interventions designed to prevent diabetic ketoacidosis in a pediatric patient
Patient Introduction

- 11 month old Native American male
- Admitted to St. Vincent Healthcare on September 14, 2016
- Discharged on September 23, 2016
- Primary diagnosis:
  - Diabetic ketoacidosis secondary to new onset type I diabetes mellitus
Diabetic Ketoacidosis (DKA)

- Occurs when the body produces high levels of ketones
- Causes
  - Illness, problems w/ insulin therapy, physical/emotional trauma, heart attack, alcohol or drug abuse
- Signs and symptoms
  - increased thirst, frequent urination, nausea/vomiting, abd. pain, weakness, fatigue ect…
Type I Diabetes Mellitus

- Insulin dependent
- Pancreas does not make enough insulin
- Causes:
  - Inherited or genetic factors, self allergy (autoimmunity), environmental damage
Nutrition Assessment

- **Client history**
  - Per mother of child (moc)
    - Patient exhibited increased thirst, increased urination, increased hunger, vomiting, respiratory distress and some weight loss
  - No family history of diabetes
Nutrition Assessment

- Food/nutrition-related history
  - Prior to admission per Moc
    - Patient consumed 3 meals per day (breakfast, lunch, and dinner) + bottles of similac sensitive formula
- Labs 9/14/16
  - Glucose: 372
  - Hemoglobin a1c: 8.3
  - Ketones urine: negative
  - Ph: 7.12
Nutrition Assessment

- Anthropometric measurements
  - Weight: 10 kg (22 lbs) = 75th percentile (WHO boys’ growth chart birth-24 months)
- Medications
  - Sub q shots of lantus and humalog: diluted to 10 units/ml
  - Upon discharge: insulin pump therapy 100 units/ml
Insulin Pump Therapy

- Delivery of rapid or short acting insulin 24 hrs/d through a catheter
- Insulin doses include:
  - Basal rates
  - Bolus
  - correction
Insulin Pump Therapy in Children and Adolescents

- **Determine the impact of insulin pump therapy including quality of life**
- **100 patients managed with insulin pump therapy, 3-19 yrs**
- **HbA1C decreased from 8.3 to 7.8**
- **Hypoglycemia decreased from 32.9 to 11.4 per 100 patients**
- **Quality of life measures showed improvement**
Nutrition Assessment

- Estimated energy needs (kcals): 980 kcal/d (98 kcal/kg RDA)
- Estimated protein needs (g): 16 g/d (1.6 g/kg rda)
- Estimated fluid needs (mL): 1000 mL/d (100 ml/kg)
Diagnosis

- Unintended weight loss related to physiological causes increasing nutrient needs related to prolonged catabolic illness (type I diabetes mellitus) as evidenced by polyuria, polydipsia, polyphagia, and increased respiratory rate.
Intervention

- Patient will consume 3 meals plus snacks as desired per day consisting of proteins, carbohydrates and lipids
- Moc will count all carbohydrates that patient consumes during meals and snacks
- Goal: patient’s blood glucose levels remain between 80-200 mg/dl
Monitoring/Evaluation

- Food intake: amount and types of food at meals
- Labs: electrolyte and glucose profile
- Anthropometric measurements: growth patterns, weight
- Nutrition focused physical findings: overall appearance
Summary

- Have a better understanding of diabetic ketoacidosis in a pediatric patient
- Understand current research regarding the quality of life pediatric patients have on insulin pump therapy
- As dietitians, we play a significant role in new onset type I diabetes mellitus in pediatric patients now and in the future
References


