

Diabetes Mellitus in Pediatrics

By John Dang



[Objectives]

- Understand the underlying pathophysiology of Diabetes Mellitus
- Control PT blood sugar levels and blood pressure
- Plan a treatment regimen
- Give PT knowledge to manage his/her chronic disease.

Pathophysiology of Diabetes

- Diabetes Mellitus has two types
- Type I
 - Insulin dependent
- Type II
 - Insulin resistant



Clinical Presentation of Diabetes Mellitus

- Polydipsia
- Polyuria
- Polyphagia*
- Weight loss*
- Fatigue



[Patient Background]

- OC is a 14 yo hispanic male.
- OC's chief complaint is hyperglycemia, hypertension, ketonuria, and glucosuria

History of Present Illness

- 14 yo previously healthy c/o polydipsia, polyuria qid.
- PT was up 4x pm to urinate.
- Also c/o chest pain for 1 year off and on tid-qid lasting 35s usually when PT was sitting and right/left pain sometimes radiates down the right leg. Some days no symptoms of chest pain.
 - No history of trauma to the area, doesn't play football or soccer, PT doesn't ride his bike often maybe once a weekly.
- PT was taken to MD in New Mexico for evaluation and growing pains.
- PT sent to UNMH pediatric clinic for evaluation and Tx.
- Blood glucose 423→3hrs later One Touch reading 321.

General Info

- PMH
- FH
- SH
- Immunization History
- ROS
- Meds



[Physical Exam]

- Gen
- HEENT
- Neck
- Chest
- CV
- Abd
- Back



[Physical Exam]

- Genitalia
- Rectal
- Extremities
- Neuro
- Skin
- Pelvic
- Pysch



Laboratory Tests

| | | |
|------------------|-----|-----------|
| ■ Sodium | 136 | (135-147) |
| ■ Potassium | 4.7 | (3.5-5) |
| ■ Chloride | 97 | (95-110) |
| ■ Carbon Dioxide | 24 | (21-32) |
| ■ BUN | 22 | (8-25) |
| ■ Serum Cr | 0.9 | (0.5-1.7) |
| ■ Glucose | 377 | (65-115) |
| ■ HGb A1c | 9.1 | (5.3-7.9) |

ALL WNL except Glucose and HGb A1c.

Glucose Monitoring

- One Touch Glucose Monitoring System
 - 4/24/04
 - 360,323,320,466,322,318,294,337
 - 4/25/04
 - 345,360,323,320,416,255,294,390
 - 4/26/04
 - 320,381,391,373,382
 - 4/27/04
 - 391,336,159,158,115
 - 4/28/04
 - 145,164,100,209,119,155

Note: Normal Glucose Levels are (65-115)

Summary of Hospital Care

- OC was admitted on 4/23/04 and discharged on 4/xx/04
- During his X day stay, he was seen for his hyperglycemia and hypertension which were adequately controlled by the time OC was discharged.
- It was determined by UNMH endocrinologist OC had DM type II and related hypertension.
- Also, PT was held 2 additional days for diabetes education.

Assessment

- O.C. has hyperglycemia with hypertension
 - BG <135mg/dL
 - BP <120/90 mmHg
 - HGb A1c <7.9%
- O.C. has high risk factors for DM type II
 - Obesity
 - Hypertension
 - Lack of Exercise
 - High HGb A1c
 - Polydipsia/Polyuria
 - No Ketones/Acidosis

[Considerations]

- OC is only 14 yo. Must consider as child and **NOT** as a miniature adult.
- OC must understand this disease won't go away like a cold or flu. We must educate our young PT to understand that OC has the power to control the magnitude of his disease state.

Planning and Treatment

- Place OC on a non-insulin dependant hypoglycemic drug to control his hyperglycemia
- Place OC on a B-blocker, diuretic, ACEI or ARB to control his hypertension.
- Check to see if they're any significant adverse drug reactions between the non-insulin dependent drug and diuretic, ACEI or ARB.
- Tx goal in diabetic PT with hypertension is 130/85 mmHg
- Antihypertensive must be compatible with DM Tx

Deciding a Drug Regimen

- Non-insulin dependant drugs
 - Biguanides
 - Metformin (Glucophage[®])
 - PPAR γ Agonists
 - pioglitazone/rosiglitazone (Actos[®]/Avandia[®])
 - α -glucosidase Inhibitors
 - Acarbose/miglitol (Precose[®], Glyset[®])
 - Sulfonylureas
 - Glyburide (DiaBeta[®])
 - Short Acting insulin secretogogues

Deciding a Drug Regimen

- Diuretics

- MOA

- May cause hypokalemia, **hyperglycemia**

- Potassium Sparing

- Weak anti-hypertensive agent

- must be used in combo with thiazide or loop diuretics

- Bottom line: PT must take an excessive amount of drugs. (compliance issue) plus the possible hyperglycemia issue with our DM PT.

Deciding a Drug Regimen

- Beta-adrenoceptor Blocking agents
 - e.g. Atenolol (Tenormin[®]), Propranolol
 - MOA
 - $CO (x) PVR = BP$
 - Why we should avoid beta blockers in diabetics?



Deciding a Drug Regimen

■ ACEI

- e.g. lisinopril, captopril, quinapril, ramipril
- MOA
- ACEI-cough
- Good for diabetics?

■ ARB

- e.g. candesartan, irbesartan, losartan, valsartan, telmisartan.
- Only used if ACEI-induced cough is manifested by the PT

[Bottom Line!]

- Put OC on ACEI and non-insulin dependent hypoglycemic combo.
 - Quinapril 10 mg PO QD for HTN
 - Metformin 500 mg PO BID for DM



[Non-pharmacological Tx]

- Diet and Exercise
- Glucose monitoring a.c., p.c. and through out the day.
- We must try to empower the patient to control their chronic disease by actively participating in disease management.



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<http://www.diabetes.org> American Diabetes Website