

Exercise Induced Collapse: Insulin Shock

Background

1. Diabetic athletes require intensive diabetes management
 - Balance insulin, carbohydrate intake, effects of exercise
2. Most common with prolonged exercise in heat
3. Proper dosing of insulin most critical for diabetic patients participating in endurance sports/extreme environmental conditions

Pathophysiology

1. Too much insulin prior to exercise
2. Honeymoon phase
 - Period of time shortly after diagnosis of type 1 diabetes during which there is some insulin production by pancreas
 - Even standard insulin dose may lead to hypoglycemia
3. Heavy exercise induces Glut-4 transport in muscle to uptake glucose without insulin causing hypoglycemia
4. Site of injection in lower fat density area allows for faster absorption of insulin
5. Insulin pump basal rate set too high

Diagnostics

1. Signs of hypoglycemia:
 - Dizziness, shakiness, hunger, heavy perspiration, vision disturbances, unsteadiness, tingling hands or lips, trouble with speech
2. Blood sugar check for collapsed athletes with known diabetes

Therapeutics

1. Unconscious athletes with known hypoglycemia should be treated with IV D50W and subcutaneous glucagon
2. Conscious athletes should be treated with oral D5W or glucose tablets
3. Instruct athletes with diabetes:
 - Wear diabetic alert tag during competition
 - Alert event authorities about their condition

Prevention

1. Decrease insulin dosage if CHO supplementation insufficient during heavy exercise
2. Analysis of "high-risk" activities is essential
 - Determine which sports may need to be modified, diminished, or restricted
3. Frequent blood sugar checks during activity
4. Carry fast acting glucose tablets during event
5. Coaches/athletic trainers have access/knowledge to administer glucagon
6. Snack after exercise
 - Prevents low blood sugar
 - Replaces glycogen storage lost during exercise
 - Hypoglycemia can occur up to 36 hr post exercise
7. Wear medical alert ID

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