McHenry Western Lake County EMS System

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INSIDE THIS ISSUE:

Diabetes: What is it?

Diabetes is a disease that results from the body's improper use and metabolism of sugar. "This is related to the bodies destruction of insulin-secreting beta cells or unknown genetic factors and aging that create a resistance to insulin," (National Research Council, 1989). There are two forms of diabetes that had old names which were based on when Diabetes was thought to occur, adult and juvenile, but those names have been replaced to reflect more of the disease process:

Insulin Dependent Diabetes or Type 1

Non-Insulin Dependent Diabetes or Type II

MWLC EMS Diabetic Management

Blood Glucose levels < or equal to 70mg/dL or Signs and Symptoms of Hypoglycemia

- GCS 14-15 and able to swallow patient may have oral glucose in gel, paste, or tabs. They may also have sugar-containing liquids if available.
- If BGL is borderline (60-70mg/dL): Dextrose 10% (25gm/250ml) infuse 12.5 gm, or half the bag. If symptoms resolve and patient becomes decisional, reassess BGL.
- If BGL <60mg/dL: Dextrose 10% (25gm/250ml) infuse 25gm. If symptoms resolve and patient becomes decisional, reassess BGL.
- Assess patient response after 5 minutes. If BGL < 70mg/dL continue care and reassessments.
- If BGL remains less than 70mg/dL: Repeat Dextrose 10% at 5gm increments (50ml) every 5-10 minutes.
- If IV access unavailable: Glucagon 1mg IM/IN.

DKA or HHNS Management

- Normal Saline wide open up to 1 Liter unless contraindicated
- Monitor lung sounds every 200ml
- Monitor EKG for dysrhythmias and T wave changes

Insulin Dependent Diabetes

Insulin Dependent Diabetes, or Type I diabetes, is a disease process that results from the body's inability to produce insulin. This happens secondary to destruction of the Beta cell in the pancreas. Onset usually happens in youth, which is why it used to be called juvenile diabetes. These patients subsequently require administration of insulin via injection to maintain stable blood glucose levels. Patients may present with a variety of symptoms including polyuria, polydipsia, and polyphagia.

Terms:

Polydipsia: excessive thirst

Polyuria: excessive urination

Polyphagia: excessive appetite

SPECIAL POINTS OF INTEREST:

- *Signs and Symptoms of Hypoglycemia*
  - *Altered Menta Status*
  - *Agitation/Irritable*
  - *Sweating*
  - *Dizziness*
  - *Hunger*
  - *Tremors*
  - *Pale skin*

Non-Insulin Dependent Diabetes

Non-Insulin dependent diabetes is the second form of diabetes that occurs later on a patients life and is a result of the body not being able to properly utilize the insulin that is produced. Similar to Type I diabetes patients suffer from rising blood glucose levels without proper treatment. These patients usually can be treated with diet modification, exercise, and if necessary an oral or injectable medication that helps stimulate the production of insulin.

Pre-Diabetes

According to the America Diabetes Association there are no symptoms tied to "pre-diabetes". They do say that these patients all present with higher than normal blood glucose levels. In this stage, though, the levels aren't high enough to make the diagnosis of diabetes. For patient presenting with a pre-diabetes, recommendations for a change in dietary intake along with slowly starting to increase exercise activity can be helpful in staving off the progression into diabetes, (ADA website, 2021).

American Diabetes Association®

Diabetic Ketoacidosis

Diabetic Ketoacidosis is a serious disorder affecting patients with Type I diabetes. In these patients, the cells are unable to take in glucose due to a lack of insulin. Glucose remains in the blood stream resulting in hyperglycemia. One way the body tries to compensate is through gluconeogenesis. "Gluconeogenesis refers to a group of metabolic reactions, some of them highly exergonic and irreversible, which are regulated both locally and globally (by insulin, glucagon, and cortisol)," (Chourpiliadis, C & Mohiuddin, SS, 2021). The result of this is a further contribution to increasing blood glucose levels. Left uncorrected this process progresses to osmotic diuresis as glucose is lost in the urine leading to dehydration. At this point the body will switch to a fat-based metabolism leading to ketone production which is what is responsible for the acidosis. Treatment for these patients revolves around hydration with intravenous fluids and slowly lowering the blood glucose level. In the field, these patient will present with a range of symptoms including but not limited to very high blood glucose levels, signs and symptoms of dehydration. They may also present with acidosis seen with altered mental status, Kussmaul respirations, and also fruity breath from ketosis.

Hyperosmolar Hyperglycemic Syndrome (or HHNS)

This is a serious complication resulting from Type II diabetes. Insulin and glucose are both present in the patients. There is just an impairment in their usage. As blood glucose continues to rise and remain elevated osmotic diuresis occurs due to glucose spilling into the urine, which creates dehydration. Compounding the dehydration is the fact that these patients usually don't take in enough fluids, to start with, which contributes to worsening dehydration. Blood glucose levels will continue to rise, but remember insulin is still present in an enough of an amount to prevent ketone production. Patients present with grossly high blood sugars and severe dehydration, absent of Kussmaul respirations and "fruity breath" associated with DKA. Treatment for these patients focuses on reversing the dehydration, slowly. Lowering the blood glucose level too rapidly can result in cerebral edema, (Bledsoe, Porter, Cherry, 2013).

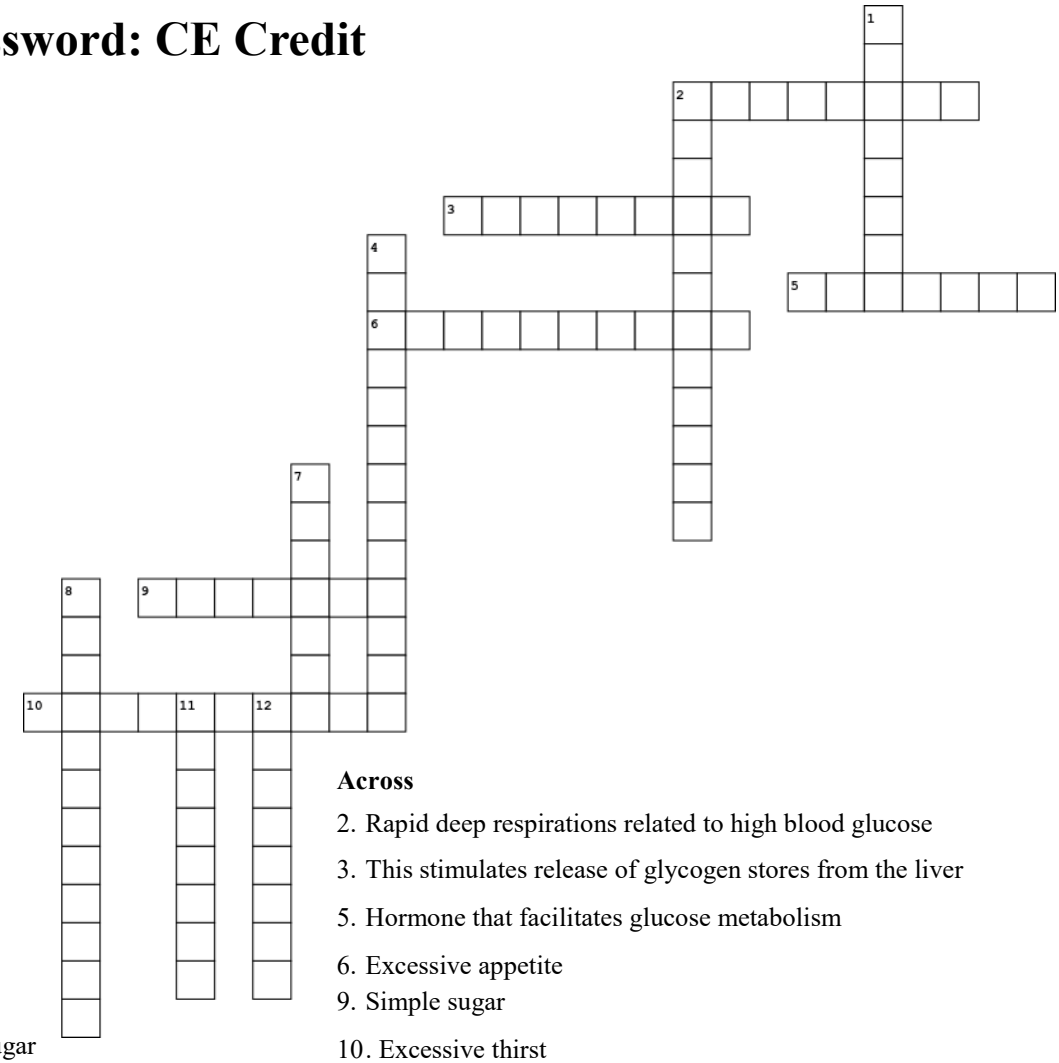
Gestational Diabetes

As pregnancies progress, hormonal changes cause an increase in insulin production in addition to a utilization of that insulin. This all happens within the first 20 weeks of gestation. Unfortunately, during the last 20 weeks, those same hormones create a resistance to that insulin and reduce the body's tolerance to glucose, which results in catabolism. Ketones are the byproduct of that catabolism and may be seen in urine tests. If that wasn't enough, maternal glucose stores get metabolized which impacts the growing fetus as this is it's sole source of glucose. (Bledsoe, Porter, Cherry, 2013).

Name:_____ Dept:_____ Email:_____

Diabetes Crossword: CE Credit

McHenry Western Lake County EMS System
McHenry Hospital
4201 Medical Center Drive
McHenry, IL 60050
Phone: 815/759-8044
Fax: 815/759-8045



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Down

1. Disease that affects how the body uses sugar

2. Acidosis resulting from excess ketones

4. Elevated blood glucose >240mg/dL

7. Byproducts of improper metabolism

8. Decreased blood glucose <60mg/dL

11. This is given to raise blood glucose levels

12. Excessive urination

Across

2. Rapid deep respirations related to high blood glucose
3. This stimulates release of glycogen stores from the liver
5. Hormone that facilitates glucose metabolism
6. Excessive appetite
9. Simple sugar
10. Excessive thirst

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