



Case Report

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Hypoglycemia Case Study

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Introduction

Diabetes mellitus is a common, chronic, and complex metabolic disorder with two distinct types [1]. Almost 10% of the United States population, or 30.3 million people have diabetes. Nearly 25% of individuals with diabetes are undiagnosed. In 2012, the overall cost for treatment of diabetes patients was nearly \$250 billion. On average \$8,000 is spent annually on medical expenditures directly related to diabetes per diagnosed individual, which is more than twice the cost for their nondiabetic counterparts [2]. Diabetes type 1 is the result of autoimmune extermination of pancreatic islet cells. Onset is frequently abrupt and is influenced by genetics and certain environmental risk factors that appear to be unrelated. Presenting symptoms may be subacute with polydipsia, polyphagia, polyuria, malaise and weight loss, or more acute with symptoms such as visual disturbances and ketoacidosis. It is more often diagnosed in childhood but, may occur at any age [3].

Insulin resistance as well as alpha and beta cell dysfunction in the pancreatic islets of Langerhans characterize diabetes type 2. Onset is more subtle and gradual than type 1 [4]. Obesity, smoking, sedentary lifestyle, high blood pressure, hyperlipidemia, and hyperglycemia are known risk factors [2]. Presenting symptoms may be similar to diabetes type 1 with polydipsia, polyphagia, polyuria, and lethargy. However, sometimes diabetes type 2 may be discovered because of signs and symptoms related to complications, or as an incidental lab finding of elevated blood glucose or glycosuria. Diagnosis is often made in adulthood but, can also happen at any age [4].

Treatment for diabetes is wide-ranging. While insulin is required for type 1, a variety of interventions are available for type 2. Lifestyle modifications including diet and exercise are

important. However, if not controlled with diet and exercise alone, many medication options, including oral and subcutaneous glucose lowering agents exist for patients to try before the need for insulin [5].

Diabetes complications may include ischemic heart disease, stroke, lower extremity amputation and diabetic ketoacidosis and is the seventh leading cause of death in the United States. Nearly 15 million emergency department visits were completed and over 7 million hospitalizations occurred in 2014 related to diabetes. About 250,000 of visits were for hypoglycemia [2]. Hypoglycemia in those with diabetes is generally defined as a BG level low enough to cause signs and symptoms or have the potential to cause harm. Although there is no standard definition, for many patients this generally occurs when BG concentration is less than 70mg/dL [5].

Hypoglycemia Case Study

Laura is a 28-year-old female brought in by her co-worker. She reports that about 30 minutes ago they were chatting about their plans for the weekend when suddenly Laura became pale, diaphoretic and verbally incoherent. Her co-worker transported Laura to the local clinic because the nearest hospital is an hour away and indicated that she does not know much about Laura's medical history. Laura has not exhibited these symptoms during the three years they have worked together in the same office.

Discussion question

What are your priority actions?

- Answer: Checking her blood sugar would be an important first step. While her symptoms could be caused by a variety of conditions, hypoglycemia should be high on the list of initial

considerations as it is more dangerous than other potential differentials. Giving her 15g of carbohydrates (4oz soda or juice, hard candy) would also be appropriate.

- Case study continuation: A glucose meter confirms her blood sugar is 58mg/dL and after consuming four ounces of orange juice, Laura is able to tell you a bit more history. She does not recall the events her co-worker described but, has been not feeling well for about a week with increased urinary frequency, urgency, and fatigue. Laura has been diagnosed with two urinary tract infections in the last year and has successfully treated her symptoms with more fluids. This time, however, despite drinking a gallon of water her symptoms have not abated. Laura had initially planned on making an appointment at the clinic after work. Laura has no past medical history, takes no medications, and has no allergies. She has no fever, chills, nausea or vomiting, or systemic symptoms. Her body mass index (BMI) is 35; otherwise, her vitals and physical exam are unremarkable.

Discussion question

What is your initial diagnosis for Laura's presentation? Any diagnostic testing you would like to complete?

- Answer: Given the hypoglycemic episode, urinary symptoms, and fatigue, Laura has pre-diabetes or undiagnosed diabetes. It would be prudent to draw a hemoglobin A1C (HgbA1C) and have her return for a fasting blood sugar as part of a comprehensive metabolic panel. A complete blood count and lipid panel should also be considered at the next visit.
- Case study continuation: Laura declined to have an HgbA1C drawn that first day after stating she would return the next day for all recommended lab work. Her pertinent positive lab work results at her follow up visit are below. All other lab work was negative.
 - i. HgbA1C: 7.3%
 - ii. FBS: 132

At her follow up visit, the following week Laura states she has had no further episodes of hypoglycemia and is anxious about her new diabetes type II diagnosis. She is motivated to lose weight.

Discussion question

What treatment would you recommend for Laura?

- Answer: Treatment for diabetes type II can be as unique as the disease process itself. The overall goals to treat diabetes are to keep quality of life, improve symptoms, reduce long-term complications, and decrease the risk of early mortality. Laura should start checking her blood sugar at home before meals, documenting her levels, and receive training on the symptoms of hypoglycemia. Lifestyle modifications in conjunction with possible medication would be suitable for Laura. Discussion of diet rich in fruit, vegetables, and lean protein in conjunction with moderate intense exercise 30 minutes/ minimum of five times per week would be appropriate. The provider may consider prescribing a first line medication such as metformin. An adequate starting dosage would be 500mg by mouth twice daily. Laura would need to be instructed on how to take the medication and informed of adverse effects [4].

Acknowledgment

None.

Conflict of Interest

No conflict of interest.

References

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