CASE SCENARIO FOR DM

LEARNING OBJECTIVES

After the class and studying this case presentation, the student should be able to:

1. Describe the major causative factors of diabetic ketoacidosis (DKA).
2. List the clinical signs and symptoms of diabetes and DKA.
3. Describe the major metabolic changes in DKA.
4. Understand the fluid and electrolyte changes in DKA.
5. Discuss the major objectives of medical management of DKA.

Mrs NG, 48-year-feamle, with a long history of obesity, diabetes, dyslipidemia, and reactive airway disease presented to the EMD with a 4-day history of weakness, tactile fever, productive cough, nausea, and vomiting. Her EPR confirmed a history of similar presentation 2 years back. Since then her diabetes is managed with diet and medications at home. She was on glipizide (Glucotrol), metformin (Glucophage), and ultralente insulin to improve glycemic control.

The nurse on examination records her temperature was 37.9 C, blood pressure was 98/64 mmHg, pulse was 136bpm, and respirations were 36/min. There was a strong smell of ketones in the exam room. Her lung sounds were clear without wheezes or rhonchi. Heart sounds were normal. The abdominal exam revealed mild epigastric tenderness to deep palpation but no rebound tenderness or guarding. Her extremities were well perfused with symmetric pulses.

The laboratory results were remarkable for a room air arterial blood gas with pH of 7.12, $paCO_2$ of 17 mmHg, and bicarbonate of 5.6 mEq/l. Urinalysis revealed 4+ glucose and 3+ ketones. Chemistry panel revealed Blood glucose of 14.2 mmol/L, BUN of 16 mg/dl, Creatinine of 121 microg/dl, Sodium of 139 mEq/l, Chloride of 112 mEq/l, CO_2 of 11.2 mmol/l, and Potassium of 5.0 mEq/l. Her Chest X-ray revealed no infiltrates. The nurse caring for Mrs NG plans her comprehensive care based on the assessment findings.

Questions

1. Is Mrs NG experiencing diabetic ketoacidosis (DKA)? Analyze the data that indicate DKA?

2. What type of diabetes does she have?

3. In the following table of lab values, explain the significance of each in DKA

Lab value	Significance
Glucose 14.2 mmol/L	
pH of 7.12	
Bicarbonate of 5.6 mEq/l	
BUN of 16 mg/dl	

4. What are the nursing interventions for maintaining airway and breathing ?

5. What fluid electrolyte imbalance is anticipated for her? List them.

6. What are the expectations from Mrs NG or her family on discharge with regard to treatment?

7. What are the characteristic metabolic derangements in diabetic ketoacidosis (DKA)?

8. What are the **basic** principles in the management of a patient with DKA?

QUESTIONS Choose **all** correct answers

1. Which of the following ***is not*** a sign of diabetes?

   A. Drinking a lot of water.
   B. Frequent urination.
   C. Increased intracranial pressure.
   D. Weight loss despite good food intake.

2. Diabetes and DKA are related to which hormonal problem?

   A. An increased insulin level.
   B. A decreased insulin level.
   C. An increased utilization of insulin by cells.
   D. A decreased utilization of insulin by cells.
   E. A and C
   F. B and D.

3. *Almost all* patients in DKA are:

   A. Only slightly dehydrated and can drink water to replace fluids.
   B. At risk of becoming dehydrated and need an IV at a TKO rate.
   C. Moderately dehydrated (1-2 liters) and need ½ normal saline.
   D. Profoundly dehydrated (5-10 liters) and need aggressive hydration with normal saline.

4. Factors leading to DKA include all of the following ***except:***

   A. Infection.
   B. Lack of insulin administration.
   C. Stress.
   D. Eating too much sugar quickly.
   E. Undiagnosed type I diabetes mellitus.

5. Altered levels of consciousness in DKA are related to:

   A. Dehydration.
   B. Acidosis.
   C. Altered glucose metabolism.
   D. All of the above.