Dawn Phenomenon

The dawn phenomenon is the presence of hyperglycemia upon awakening. The increase in blood glucose is caused by increased hormone production in the early morning hours. Between the hours 2AM-6AM, the body naturally increases production of growth hormone and cortisol. Treatment involves changing the patient's current insulin regimen. The patient may have their current administration times changed, be given a long-acting insulin in the evening, or be given an insulin pump. Since insulin affects blood glucose levels, the patient's glucose levels should be closely monitored particularly between 2AM-6AM. Instruct the patient to limit carbohydrates before bedtime to avoid spikes in blood sugar during the night.

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Cause/Mechanism

Increased Hormone Production

Up-arrow Harmonica

The dawn phenomenon is caused by increased hormone production between 2 AM-6 AM. During this time, the body naturally increases the production of growth hormones and cortisol. These hormones cause the liver to release large amounts of glucose into the bloodstream and prevent the body from naturally lowering blood glucose levels. As a result, the body develops insulin resistance. Since the dawn phenomenon is most severe when growth hormone is at its peak, adolescents and young adults are more commonly affected.

Assessment

Hyperglycemia Upon Awakening

Hiker-glue Waking-up

Between 2 AM-6 AM, the patient's blood glucose will rise. Hyperglycemia upon awakening is characteristic of the dawn phenomenon and occurs more commonly in patients with type 1 diabetes mellitus.

Interventions

Long-Acting Evening Insulin

Long Insect-syringe Sun-set

Administering long-acting evening insulin may help stabilize nighttime blood glucose levels in diabetic patients. During the night, the exogenous insulin peak will cover the patient's rise in blood sugar. The patient may also require additional insulin to effectively control blood glucose levels.

Change Administration Times

Changing Time on Administration Clock

Changing the administration times of insulin may help avoid hyperglycemia caused by the dawn phenomenon. The patient's current insulin schedule and patterns of hyperglycemia should be evaluated to determine a more appropriate schedule for administering insulin. The healthcare provider may adjust administration from dinnertime to bedtime. In addition, the patient's current insulin may be switched to a different type for better glucose control.

Insulin Pump

Insect-syringe Pump

The patient experiencing the dawn phenomenon may use an insulin pump. During the early-morning hours, the pump will administer additional insulin to avoid the effects of hyperglycemia related to the dawn phenomenon.

Considerations

Closely Monitor Glucose Levels

Monitor and Glue-bottle

The patient experiencing the dawn phenomenon should closely monitor blood glucose levels to help determine the cause of changes; normal or high blood glucose levels in the middle of the night suggest the dawn phenomenon, while low levels may indicate the Somogyi effect.

Between 2-6AM

(2) Tutu with (6) Sax and Morning-sun

Since the body naturally increases certain hormones affecting glucose levels during the middle of the night, obtain the patient's blood glucose levels between 2 AM-6 AM. If the patient's blood glucose level is high between 2 AM-6 AM, the prescribed insulin dosage may be increased.

Limit Carbohydrates Before Bedtime

Limit Bread Before Bed

Bedtime snacks may affect the patient's glucose level during the night. Instruct the patient to limit carbohydrates before bedtime to avoid spikes in blood sugar during the night. Instead of high carbohydrate food, snacks containing protein and fats are encouraged to help maintain the patient's blood glucose level.