

# The somogyi phenomenon: Mechanism, symptoms and diagnosis

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## Description

The Somogyi reaction, also known as the “rebound hyperglycemia,” is a phenomenon that can occur in individuals with diabetes, particularly those who use insulin. Named after Dr. Michael Somogyi, who first described the effect in the 1930s, this reaction involves a drop in blood glucose levels followed by a compensatory spike, which can complicate diabetes management.

The Somogyi reaction occurs when blood sugar levels fall too low (hypoglycemia), prompting the body to respond with mechanisms that raise blood sugar levels back to normal. This rebound effect often results in elevated blood sugar levels that can be mistaken for poorly controlled diabetes. Low blood sugar during the night causes the Somogyi effect, yet low blood sugar has nothing to do with the dawn phenomenon. Doctor can determine which one patient is experiencing by taking a blood sugar reading in the middle of the night, either manually or using a continuous glucose monitor.

## ■ Mechanism behind the somogyi reaction

The Somogyi reaction typically follows these steps:

**Hypoglycemia:** Various factors, such as too much insulin, missed meals, or intense physical activity, can lead to low blood sugar levels.

**Counterregulatory hormone release:** In response to hypoglycemia, the body releases counterregulatory hormones, including glucagon, epinephrine, and cortisol. These hormones work to increase blood glucose levels.

**Rebound hyperglycemia:** The surge in glucose production and release from the liver can lead to elevated blood sugar levels several hours later, often in the morning.

## ■ Symptoms of the somogyi reaction

The Somogyi reaction can be difficult to identify, but individuals may experience:

**Night sweats:** Waking up drenched in sweat can be a sign of nighttime hypoglycemia.

**Morning headaches:** A headache upon waking can occur as a result of elevated blood sugar levels.

**Fatigue:** Feeling unusually tired or lethargic in the morning.

**High morning blood sugar levels:** Noticing elevated blood sugar readings upon waking can indicate the presence of the Somogyi effect.

## ■ Diagnosis

Diagnosing the Somogyi reaction involves careful monitoring of blood sugar levels, especially overnight. Healthcare providers may recommend:

**Frequent monitoring:** Checking blood sugar levels before bed, during the night, and upon waking to identify patterns.

**Log keeping:** Maintaining a diary of food intake, insulin doses, and blood sugar readings to help identify potential causes of hypoglycemia and subsequent rebound hyperglycemia.

## ■ Management strategies

Managing the Somogyi reaction involves a multifaceted approach:

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**Adjusting insulin doses:** Healthcare providers may recommend modifying insulin doses, especially those taken before bedtime, to prevent nighttime hypoglycemia.

**Dietary changes:** Consuming a balanced snack before bed that includes carbohydrates and protein can help stabilize blood sugar levels overnight.

**Continuous Glucose Monitoring (CGM):** For some individuals, using a CGM can provide real-time data on blood sugar levels, helping to prevent hypoglycemia.

**Educating patients:** Understanding how the body responds to low blood sugar can empower

individuals with diabetes to make informed decisions about their insulin management and lifestyle choices.

The Somogyi reaction illustrates the complex interplay between insulin, blood sugar levels, and the body's counterregulatory responses. For individuals with diabetes, recognizing and managing this phenomenon is important for achieving optimal glycemic control and preventing complications. Through careful monitoring, dietary adjustments, and communication with healthcare providers, individuals can better navigate the challenges associated with the Somogyi reaction, ultimately leading to improved health and quality of life.