



Breast Cancer Risk and Insulin Resistance

Many people know that insulin is a hormone that helps to regulate the body's blood sugar, or *glucose*, levels, and that too much insulin in the body, or *hyperinsulinemia*, is connected to type 2 diabetes. What is less commonly known is that hyperinsulinemia is also linked with an increase in a person's risk of breast cancer. Both associations are due to the various effects insulin has on the body.

WHAT DOES INSULIN DO?

Insulin regulates blood sugar by acting like a key that allows glucose to enter a cell to be used for energy. *Insulin resistance* develops when the body's blood sugar levels are too high for too long. The cells become resistant to insulin and require more insulin to take up the extra blood sugar. The end result is excess glucose and insulin in the bloodstream, leading to chronic diseases such as type 2 diabetes mellitus, cholesterol abnormalities, and stroke.

Insulin also stimulates cell growth and division in sensitive tissues. Excess growth and division of cells is the underlying cause of cancer development. Many breast cancers are sensitive to the effects of insulin. Insulin also indirectly raises estrogen levels, and many breast cancers are also sensitive to estrogen. This is the link between excess insulin and breast cancer.

HOW DO I KNOW IF I AM INSULIN RESISTANT?

Insulin resistance can occur in different body types. Being overweight puts one at risk for hyperinsulinemia, but it depends on where the excess fat tissue is stored in the body. Fat that is stored in the abdomen, especially in the liver, is associated with hyperinsulinemia, whereas fat that is stored on the thighs or "all over" is not.

To determine if you are at risk, your doctor will look at several measures that together can suggest whether or not you have the *metabolic syndrome*, which is synonymous with hyperinsulinemia.

You likely have the metabolic syndrome if you have at least 3 out of the 5 following criteria:

- Blood pressure > 13/85
- Elevated triglycerides > 150 mg/dl
- Low HDL cholesterol < 40 mg/dl (males) or < 50 (females)
- Fasting blood sugar > 100
- Abdominal obesity:
 - Males: waist-to-ratio of > 1 or waist circumference of > 40 in
 - Females: waist-to-hip ratio of > 0.85 or waist circumference of > 35 in

WHAT CAN I DO TO TREAT INSULIN RESISTANCE?

The good news is lifestyle changes can restore insulin sensitivity. Specifically:

- Get active!** Even when exercise does not result in weight loss, you can improve insulin sensitivity.
- Limit the sweets!** Eat a whole-food, plant-based diet, such as the Mediterranean Diet or Anti-Inflammatory Diet.
- Get some sleep!** Go to bed and wake up at the same time every day. Get 7-8 hours nightly. If you are having issues with sleep, talk to your doctor.

The above recommendations are simple but powerful tools for improving your body's use of blood sugar and thereby potentially lowering your risk not only for chronic metabolic diseases but also breast cancer. Not all breast cancer is associated with insulin levels, but anything one can do to reduce her overall risk is important. And the above changes impact health on many levels!

My Health Care Provider's Notes:
