Estrogen, Metabolic Syndrome, and Erectile Function

When we think of major sex hormones, estrogen and testosterone usually come to mind first. And even though we know that men’s and women’s bodies make both, it’s easy to automatically associate estrogen with women and testosterone with men. After all, these hormones drive secondary sex characteristics.

However, estrogen might be more involved with erectile function than scientists thought. A new study has shown that erectile function in rabbits that have been fed a high-fat diet is affected more by high levels of estradiol (E2) than low testosterone.

In their Journal of Sexual Medicine report, researchers from the University of Florence in Italy explained that while estrogen receptors were important for counteracting the effects of hyperestrogenism in fetal or newborn males, it was unclear how an excess of estrogen affected adult penile function.

They noted that obesity presented a workable model, as estrogen levels may rise because of the increased expression of aromatase in fat tissue. Visceral obesity, they explained, is a major symptom of metabolic syndrome, which increases one’s risk for cardiovascular problems and type 2 diabetes.

To learn more about estrogen’s role in erectile dysfunction associated with metabolic syndrome, they conducted a rabbit study. When given a high fat diet, rabbits exhibit symptoms of metabolic syndrome that are similar to humans, including obesity, dyslipidemia, and glucose intolerance.

A control group of rabbits was fed a standard rabbit diet. A treatment group received a high-fat diet designed to induce metabolic syndrome. The treatment group was then divided into two subgroups. One group was given tamoxifen; the other received testosterone.

As the rabbits in the high-fat diet group developed symptoms of metabolic syndrome, the two subgroups also developed a sex steroid imbalance. One group had low testosterone levels; the other had high E2 levels.

The researchers found that E2 had more of a negative impact on the rabbits’ erectile function. In turn, symptoms of metabolic syndrome improved in the rabbits treated with testosterone. These rabbits saw their E2 levels normalize as well.
Tamoxifen also helped restore erectile function for the rabbits given a high fat diet, as it increased testosterone levels.

How might this apply to humans patients? As clinicians, it’s important to encourage the management of metabolic syndrome. As appropriate, we can guide our patients to follow healthier diets, exercise more, maintain a healthier weight, and control their blood sugar and cholesterol.

Taking these steps may help sustain their erectile function over time as well as reduce the risk of chronic medical conditions.

Resources

The Journal of Sexual Medicine

Vignozzi, Linda, MD, PhD, et al.

“Estrogen Mediates Metabolic Syndrome-Induced Erectile Dysfunction: A Study in the Rabbit”

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