

Researchers unlock 30 new genes responsible for early onset puberty

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University of Minnesota School of Public Health researcher Ellen Demerath, Ph.D., is among an international group of researchers that has identified 30 new genes responsible for determining the age of sexual maturation in women. Many of these genes are also known to influence body fatness, obesity, and energy metabolism. Prior to the multi-institutional study, only four genes had been identified as contributing to the process.

The findings, which were reported in [Nature Genetics](#), help to explain why girls who are obese tend to have earlier puberty: some of the same genes are involved in both outcomes. Early menarche, or the first menstrual cycle, is linked to a variety of chronic adulthood diseases, including [breast cancer](#), cardiovascular diseases, and type 2 diabetes.

As a result of these discoveries, Demerath suggests that health care providers and other professionals pay particularly close attention to girls with a high risk of obesity (those who are overweight in childhood or who have a parental history of obesity) and intervene with them, as those girls are also genetically more susceptible to early menarche.

"Early menarche is caused by both genetics and environmental factors," said Demerath. "We already knew that diet and [physical exercise](#) play a role in menarche, but now that we've identified more of the specific genes involved, this gives us clues about how to intervene on the process. By showing how hereditary and biological factors contribute to early menarche, we hope to one day allow [health care providers](#) to identify

girls with increased risk of early menarche, and help them avoid the complications of early-onset puberty."

In the large-scale, NIH-funded study, researchers from 104 institutions collected data from more than 100,000 women from the United States, Europe, and Australia. This includes women from the Twin Cities area enrolled in the Atherosclerosis Risk in Communities (ARIC) study. Not only were researchers able to identify these new genes, but they also found that many of them play a role in body weight regulation or biological pathways related to fat metabolism. The study findings also suggest that menarche is a result of a complex range of biological processes.

Today, girls are menstruating earlier than ever before. In the mid-1900s, the average age of menarche was 14-15 years. The average age today is 12-13 years.

"We now know that hormone regulation, cell development, and other mechanisms are related to menarche," said Demerath.

According to Demerath, the next step for researchers is to examine whether some of these genes also influence sexual development in males, whether the genes are related to general growth in size as well as development, the points in the life cycle when the [genes](#) are most powerfully expressed, and how environmental factors such as diet and physical activity can modify their effects.

Provided by University of Minnesota

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