Early puberty linked with increased risk of obesity for women

March 15 2018

Credit: CC0 Public Domain

Girls who start puberty earlier are more likely to be overweight as adults, finds new research from Imperial College London.

The researchers say their findings, published today in the *International Journal of Obesity*, strengthen existing evidence of a link between the onset of puberty and a woman's body mass in adulthood.

Previous studies have established a link between obesity and puberty, with increased bodyweight known to be a risk factor for girls starting puberty earlier.

However, these observational findings can be influenced by situational factors, such as ethnicity, economic background, education level, and diet, making it difficult to determine whether early puberty or these other factors are the cause.

But now this latest research shows that early puberty is itself a risk factor for being overweight, with girls who have their first period earlier more likely to have a higher Body Mass Index (BMI).

According to the authors of the study, their findings help to untangle these complex external factors and add insight into an underlying causal link, showing that early puberty has a significant impact on a woman's risk of obesity.

Dr Dipender Gill, a Wellcome Trust Clinical Research Fellow in the School of Public Health and first author of the study, said: "Previous studies have shown there is an association, but we didn't know whether early puberty caused obesity in adulthood, or was simply associated with it. In our latest study we've generated evidence to support that it is a causal effect."

In order to get around the effects of confounding factors, the Imperial team used genetic variants as a tool to look at the effect of the onset of puberty (known as age at menarche), measured as the age of a girl's first period.

The genes in every cell of our bodies are randomly gifted to us from our parents when their sperm and egg cells fuse, with the outcome of this random jumble being the genetic basis of the embryo - influencing everything from hair colour to risk of disease for the rest of your life.

But single 'letter' changes to the DNA sequence of a gene can alter its function. In terms of disease risk, these single letter variants (called single-nucleotide polymorphisms, or SNPs) can result in a small increase or decrease in risk. The combination of variants of more than 20,000 genes contribute towards our cumulative genetic risk.

In the latest study, researchers employed a statistical technique called Mendelian Randomization which uses these genetic variants as a tool to show the causal relationship between earlier puberty and increased BMI.

Using data from 182,416 women they identified 122 genetic variants that were strongly associated with the onset of puberty - with the women's age at first period obtained via questionnaire.

The team then looked at data from the UK Biobank, which holds biomedical information on hundreds of thousands of people, incorporating physiological measurement data with genetic sequence data and questionnaire responses. Specifically, they looked for the effect of the genetic variants related to age at menarche with BMI in a second set of 80,465 women from the UK Biobank, for whom they also had measurements for BMI.

Initial analysis revealed a link between these genetic variants and BMI, with those women who had variants associated with earlier puberty having an increased BMI. The researchers then tested for this same association in a third group 70,962 women, finding the same association.

Dr Gill, added: "Some of these genetic variants are associated with

earlier puberty and some with later onset, so by taking advantage of this we were able to investigate any association of age at menarche with BMI in adulthood.

"We're not saying that it's a genetic effect, but rather that by using these genetic variants as a proxy for earlier puberty, we are able to show the effect of earlier puberty without the impact of external factors that might confound our analysis. We performed a range of statistical sensitivity analyses to test the robustness of our findings and they remained strong through this, so within the limitations of the study design, we are confident of findings."

Previous research from the group has used the same technique to show that low iron levels are associated with an increased risk of heart disease, as well as showing that girls who start puberty earlier are likely to spend less time in education.

Future studies will use the same Mendelian Randomization approach to look at genetic variants in relation to drug targets for cardiovascular disease and stroke.

The technique is not without its limitations, and it is possible that these genetic variants could be influencing bodyweight independently of age at menarche, such as through altering metabolism or fat production. However, even after the team had removed any genetic variants that were also associated with childhood obesity (12 in total), they came to the same finding.

According to the researchers, it remains unclear how maturing earlier has a direct impact on bodyweight, but they indicate that differences between physical and emotional maturity may play a role. It could be that young women who mature earlier than their peers are treated differently or have different societal pressures than girls of the same age

who have not started puberty.

Another explanation could be the physical effects of hormonal changes during puberty, such as increased fat deposition in breast tissue, which when established earlier may move them to a higher risk profile for higher BMI or obesity in later life.

"It is difficult to say that changing someone's age of puberty will affect their adult risk of obesity and whether it is something that we can clinically apply - as it would unlikely be ethically appropriate to accelerate or delay the rate of puberty to affect BMI," added Dr Gill. "But it is useful for us to be aware that it's a causal factor- girls who reach puberty earlier may be more likely to be overweight when they are older."

Provided by Imperial College London

Citation: Early puberty linked with increased risk of obesity for women (2018, March 15) retrieved 5 May 2024 from https://medicalxpress.com/news/2018-03-early-puberty-linked-obesity-women.html