

New gene variants found in childhood body mass index

10 March 2016



Credit: NIH

An international team of scientists has identified novel gene locations associated with childhood body mass index (BMI)—an important measurement related to childhood obesity. The meta-analysis, covering over 47,000 children, is the largest genetic study to date of childhood BMI.

"Although investigators have found many genes associated with adult BMI, the genetics of childhood BMI has remained largely unknown," said Struan F.A. Grant, Ph.D., a genomics researcher at The Children's Hospital of Philadelphia (CHOP), and one of three co-senior authors of the study. "Given the fact that [childhood obesity](#) is an important concern in public health, identifying specific genetic influences could prove useful in designing future preventive interventions and treatments for children."

The study appeared in the Jan. 2, 2016 issue of *Human Molecular Genetics*.

Grant's co-senior authors were Nicholas J. Timpson, of the University of Bristol, U.K.; and Vincent W.V. Jaddoe, of University Medical Center, Rotterdam, Netherlands. All three are leaders of an international collaborative group, the Early Growth Genetics (EGG) Consortium. Another CHOP researcher, Jonathan P. Bradfield, is a co-first author of the study.

The meta-analysis covered 33 genome-wide association studies, including a total of over 45,000 children, all of European ancestry. Of that total, there were 35,668 children from 20 studies in the discovery phase, and 11,873 children from 13 replication studies. The researchers found 15 genomic regions associated with childhood BMI, three of which were novel.

In all, the 15 risk-susceptibility loci account for 2 percent of the variance in childhood BMI. Despite this small proportion, said Grant, it provides crucial novel insight into the biology of obesity and provides opportunities for generalized therapeutic intervention. The 12 previously discovered genetic loci were shared between both adults and [children](#) with high BMI. The large overlap, said the authors, suggests that the genetic variants may not exert their effects only in childhood, but may have different effects at different ages.

Grant added that further research may determine whether the three novel loci the study group discovered influence BMI only in childhood, or whether their effects are stronger during childhood.

The current study, said Grant, dovetails with a 2012 meta-analysis he led for the EGG Consortium, published in *Nature Genetics*. That research was the largest genome-wide study of common childhood obesity. "Obviously, much research remains to be done," said Grant, who added, "As we continue to identify gene variants implicated in pediatric obesity and body mass, we are laying a foundation for research that could provide useful

biological targets for better treating childhood obesity, and its negative health consequences."

More information: Janine F. Felix et al. Genome-wide association analysis identifies three new susceptibility loci for childhood body mass index, *Human Molecular Genetics* (2016). [DOI: 10.1093/hmg/ddv472](https://doi.org/10.1093/hmg/ddv472)

Provided by Children's Hospital of Philadelphia

APA citation: New gene variants found in childhood body mass index (2016, March 10) retrieved 1 May 2021 from <https://medicalxpress.com/news/2016-03-gene-variants-childhood-body-mass.html>

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