

Obesity during adolescence linked to increased risk of stroke as an adult

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Micrograph showing cortical pseudolaminar necrosis, a finding seen in strokes on medical imaging and at autopsy. H&E-LFB stain. Credit: Nephron/Wikipedia

Higher body mass index (BMI) in adolescence is associated with a significantly higher risk of first ischemic stroke in adults under age 50 regardless of whether they had Type 2 diabetes, according to new research published today in *Stroke*, a journal of the American Stroke Association, a division of the American Heart Association.

While rates of adolescent obesity and [stroke](#) among adults under the age of 50 years continue to rise around the world, the precise link between the two conditions is still not fully understood.

"Adults who survive stroke earlier in life face poor functional outcomes, which can lead to unemployment, depression and anxiety," said study co-author Gilad Twig, M.D., M.P.H., Ph.D., an associate professor in the Medical Corps of the Israel Defense Forces and the department of military medicine, Faculty of Medicine of The Hebrew University in Jerusalem, Israel. "The direct and [indirect costs](#) attributed to stroke prevention and care are high and expected to keep increasing since the rate of stroke continues to rise."

This study specifically analyzed [adolescent](#) BMI and first stroke before the age of 50 among 1.9 million men and women (ages 16 to 20; 58% men; 84% born in Israel) from two nationwide databases: the Israel Defense Forces and the Israeli National Stroke Registry. All the participants in the database had undergone one complete medical exam between 1985 and 2013.

Standard BMI groups are underweight (less than 5th percentile), low-normal BMI (5th to 49th percentile), high-normal BMI (50th to 84th percentile), overweight (85th to 94th percentile), and obese (greater than 95th percentile). Details on percentile BMI measures by gender are in the article.

During the follow-up period, for all 1.9 M participants between 2014 and 2018, researchers found:

Overall, 1,088 strokes occurred (921 ischemic strokes, 167 hemorrhagic strokes), and the average age at the time of the stroke was 41. Adolescent BMI was directly related to the risk of first ischemic stroke.

Compared to participants in the low-normal BMI group, adolescents who were in the overweight category had a 2-times higher stroke risk before the age of 50, and adolescents with obesity had a 3.4-times higher risk.

Even adolescents with BMIs in the high-normal range were more likely to have a stroke before age 50 compared to those in the low-normal BMI group.

After accounting for Type 2 diabetes, adolescents who were in either the overweight or obesity category still had a higher risk of stroke (1.6-times and 2.4-times, respectively) compared to people who had BMI values within the normal range.

Despite overweight and obesity during adolescence being a common problem, researchers were surprised to find that Type 2 diabetes did not explain the higher risk for [ischemic stroke](#), which occurred even before the age of 30 in some cases. Current medical literature has shown that having a stroke early in life may lead to recurrent stroke, heart attack, long-term care and premature death, Twig noted.

"Our findings underscore the importance of effective treatment and prevention of high normal and excessively high BMI during adolescence," Twig said. "Our study is also the first to show that the risk of stroke associated with higher BMI values is the same for both men and women."

A major limitation of the study is that BMI data at follow-up were not available for all participants, which meant that researchers were unable to assess the contribution of obesity over time to stroke risk and to determine the independent risk of BMI during adolescence.

More information: *Stroke* (2021). [DOI: 10.1161/STROKEAHA.120.033595](https://doi.org/10.1161/STROKEAHA.120.033595)

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