Weight gain in young and middle-aged adults is linked to poor heart health in older age

July 16 2024

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By the time they are in their 60s, fewer people who gain excess weight from their 20s onwards have healthy hearts, according to research published in the *European Heart Journal* today.

Scientists found links between weight gain in young and middle-aged adults and enlarged hearts that pump blood less efficiently. This is over and above the effect of being overweight in later years.

The findings are based on a major study that monitored the health of all the babies born in England, Scotland and Wales during one week in 1946.

The study was led by Alun Hughes, Professor of Cardiovascular Physiology and Pharmacology at UCL in London, UK. He said, "We know that being overweight is associated with poorer heart health, but we know little about the long-term relationship between being overweight over the adult life course and subsequent heart health. We wanted to look at whether being overweight at earlier stages of adult life showed lasting associations with poorer heart health irrespective of people's weight in later life."

Researchers examined data on 1,690 people who were part of the British Medical Research Council National Survey of Health and Development Birth Cohort. Throughout their adult lives, these people had their body mass index (BMI) and waist-to-hip ratio measured. They were also given echocardiograms, in which ultrasound is used to investigate the structure and function of the heart.

Researchers were particularly interested in a measurement called the left ventricular mass because when this is higher than expected, it indicates a larger amount of heart tissue. This is a reliable indicator of poor heart health and an increased risk of death from heart disease.

The data showed that people whose BMI was elevated at any time from age 20 onwards had higher left ventricular mass in their 60s, even when researchers took account of people's BMI in their 60s. For example, in an average 43-year-old, a five-unit higher BMI corresponded with a 15%

or 27-gram increase in left ventricular mass.

"This suggests that weight gain, even at a young age, leads to heart damage over and above the effects of being overweight in later life," Professor Hughes explained.

"Maintaining a healthy weight is likely to be important for people even in early adulthood and if we want to improve heart health in the long term, we need to prevent weight gain in people of all ages. This means developing policies that will reduce the current epidemic of obesity."

The researchers caution that the study included mostly white European people, so it may not apply to the global population.

Professor Hughes continued, "This type of study cannot prove incontrovertibly that earlier weight gain causes heart damage, only that the two are closely linked. It also does not tell us how the two are linked, but if being overweight has effects on the heart that are irreversible or only partially reversible, then we might expect to see heart damage that accumulates and worsens throughout life.

"This work couldn't have happened if researchers and funders hadn't taken a long view and supported research starting at birth and continuing throughout the life course," Professor Hughes added.

The researchers will now study the role of diabetes and high blood sugar in explaining the link between weight gain and heart health. They also plan to study weight gain in childhood and adolescence in relation to heart health.

In an accompanying editorial, Professor Leonardo Roever from the Brazilian Evidence-Based Health Network, Uberlândia, Brazil and colleagues write: "… this study poignantly summarizes the temporal and

dimensional continuum of cardiac injury associated with abnormal BMI, and provides compelling evidence that being overweight or obese, even at a younger age, translates into an unfavorable cardiovascular risk profile …"

They add, "… it is likely that improvements in BMI over several decades, such as in a patient who was obese when young but has now successfully lost weight due to dieting and exercising, may translate into significant clinical benefits from prevention or reversal of cardiac injury or dysfunction."

More information: Alun Hughes et al, Adulthood adiposity affects cardiac structure and function in later life, *European Heart Journal* (2024). DOI: 10.1093/eurheartj/ehae403

Leonardo Roever et al, Lifelong impact of adiposity on cardiac structure and function: an alarming signal, *European Heart Journal* (2024). DOI: 10.1093/eurheartj/ehae443

Provided by European Society of Cardiology