Medical Xpress

Long-term anabolic steroid use may weaken heart more than previously thought

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(PhysOrg.com) -- Long-term anabolic steroid use may weaken the heart more than previously thought and may increase the risk of heart failure, according to research reported in Circulation: Heart Failure, an American Heart Association journal.

Anabolic-androgenic steroids mimic the naturally occurring testosterone, a muscle-building hormone that promotes male sexual characteristics.

“Anabolic steroids, in addition to being illegal, have important health consequences,” said Aaron L. Baggish, M.D., lead author of the study and instructor in the Department of Medicine at Massachusetts General Hospital in Boston. “I think for the first time we’re starting to realize that the heart is one of the organs that is negatively impacted by long-term steroid use.”

In the small study, investigators found that the left ventricle, the heart’s main pumping chamber, was significantly weaker during contraction (systolic function) in participants who had taken steroids compared to a group of similar non-steroid users.

A healthy left ventricle pumps out 55 percent to 70 percent of the blood that fills the heart (a measurement known as ejection fraction). Eighty-three percent of steroid users in the 12-person study had a low pumping capacity (ejection fraction less than 55 percent) that previous studies have linked to increased risk of heart failure and sudden cardiac death. In contrast, only one of the non-steroid users had a low ejection fraction.

Steroid users also exhibited impaired diastolic function, which is when the left ventricle relaxes and fills with blood. The researchers showed that ventricle relaxation among steroid users, as demonstrated by the left ventricle's ratio of early-to-late blood filling, was reduced by almost half (0.93 compared with 1.80 among non-users). The left ventricle's structure was similar in both steroid-users and non-users.

Baggish and his co-investigators used a technique known as Doppler echocardiography to examine the left ventricle's function and structure. The test uses high-frequency sound waves, or ultrasound, to create moving pictures of the heart and its blood flow.

The steroid-using group included 12 male weight lifters, average age 40, who reported taking about 675 milligrams of steroids per week for nine years. The control group was seven age-matched, male weight lifters who reported no steroid exposure. Both groups had similar durations of past and current weight lifting and other physical activity, as well as similar cardiac risk factors other than steroid use. Although the users and non-users had comparable body-mass indices and body-surface areas, the steroid users had more muscle mass than the non-users.

Despite the small sample size, the statistically significant differences in heart function suggest a strong link between steroid use and heart impairment, said investigators who are conducting further studies to confirm their findings.

In previous studies, the precise effects of steroid use on heart dysfunction have been unclear. Part of the problem with conducting studies of steroid-related heart injury is that illegal anabolic steroid use is relatively recent. In the United States, these drugs first became widespread among athletes in the 1980s; so many steroid users from that era are now reaching the age when heart problems often surface.

“What we hope is that people start recognizing steroid use as a potential cause of heart disease and a cause of otherwise unexplained heart dysfunction in young people,” Baggish said.

Provided by American Heart Association