Cannabis use shows substantial risks, no benefits for cardiovascular health

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The chemicals in cannabis have been linked to an increased risk of heart attacks, heart failure and atrial fibrillation in observational studies; however, a full understanding of how use of cannabis affects the heart

and blood vessels is limited by a lack of adequate research, according to a new Scientific Statement from the American Heart Association (AHA) published today in its flagship journal *Circulation*.

According to the statement, although cannabis, also known as marijuana, may be helpful for conditions such as spasticity associated with multiple sclerosis, among others, cannabis does not appear to have any well-documented benefits for the prevention or treatment of cardiovascular diseases. Preliminary studies have found that cannabis use could negatively impact the heart and blood vessels.

"Attitudes towards recreational and medicinal use of cannabis have changed rapidly, and many states have legalized it for medical and/or recreational use. Health care professionals need a greater understanding of the health implications of cannabis, which has the potential to interfere with prescribed medications and/or trigger cardiovascular conditions or events, such as heart attacks and strokes," said Robert L. Page II, Pharm.D., M.S.P.H., FAHA, chair of the writing group for the statement and professor in the department of clinical pharmacy and the department of physical medicine/rehabilitation at the University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences in Aurora, Colorado.

A recent study cited in the statement suggests that cannabis use is present in 6% of heart attack patients under 50 years of age. Another study found that cannabis users ages 18 to 44 had a significantly higher risk of having a stroke compared to nonusers. "Unfortunately, most of the available data are short-term, observational and retrospective studies, which identify trends but do not prove cause and effect," said Page.

The most common chemicals in cannabis include THC (tetrahydrocannabinolic acid), the component of the plant that induces a "high," and CBD (cannabidiol), which can be purchased over the

counter, but to date, the FDA has only approved one CBD-derived product. Importantly, the FDA has not approved any other cannabis, cannabis-derived, or cannabidiol (CBD) products currently available on the market.

Some studies have found that within an hour after cannabis is smoked, THC may induce heart rhythm abnormalities, such as tachycardia, premature ventricular contractions, atrial fibrillation and ventricular arrythmias. Acutely, THC also appears to stimulate the sympathetic nervous system, which is responsible for the "fight or flight" response, resulting in a higher heart rate, a greater demand for oxygen by the heart, higher blood pressure while laying down and dysfunction within the walls of the arteries.

In contrast, studies on CBD, which does not produce a "high" or intoxication, have found associations with reduced heart rate, lower blood pressure, increased vasodilation (ability of the arteries to open), lower blood pressure and potentially reduced inflammation. Inflammation is linked to atherosclerosis, the slow narrowing of the arteries that underlies most heart attacks and, possibly strokes.

Smoking and inhaling cannabis, regardless of THC content, has been associated with cardiomyopathy (heart muscle dysfunction), angina (chest pain), heart attacks, heart rhythm disturbances, sudden cardiac death and other serious cardiovascular conditions. In states where cannabis has been legalized, an increase in hospitalizations and emergency department visits for heart attacks has been observed.

The way cannabis is consumed may influence how it affects the heart and blood vessels. "Many consumers and health care professionals don't realize that cannabis smoke contains components similar to tobacco smoke," said Page. Smoking and inhaling cannabis, regardless of THC content, has been shown to increase the concentrations of blood

carboxyhemoglobin (carbon monoxide, a poisonous gas) five-fold, and a three-fold increase in tar (partly burnt combustible matter), similar to the effects of inhaling a tobacco cigarette.

Carbon monoxide intoxication from inhaled tobacco or cannabis has been associated with several heart problems, such as heart muscle disease, chest pain, heart attacks, heart rhythm disturbances and other serious conditions.

Cannabis use should be discussed in detail with a health care professional so that an individual's potential health risks can be reviewed. "If people choose to use cannabis for its medicinal or recreational effects, the oral and topical forms, for which doses can be measured, may reduce some of the potential harms. It is also vitally important that people only use legal cannabis products because there are no controls on the quality or the contents of cannabis products sold on the street," said Page.

In addition to the poisonous compounds in cannabis smoke, vaping cannabis may also result in serious health outcomes, especially when it is mixed with vitamin E acetate oils, which are linked to EVALI (e-cigarette or vaping product use-associated lung injury), the potentially fatal illness that emerged among e-cigarette users last year.

"People who use cannabis need to know there are potentially serious health risks in smoking or vaping it, just like tobacco smoke. The American Heart Association recommends that people not smoke or vape any substance, including cannabis products, because of the potential harm to the heart, lungs and blood vessels," said Rose Marie Robertson, M.D., FAHA, the deputy chief science and medical officer for the American Heart Association and co-director of the AHA Tobacco Center for Regulatory Science.

The statement also discusses cannabis use among older adults, people diagnosed with cardiovascular diseases and other populations including youth. Some studies have suggested that cannabis use—both CBD and THC—may be safe and effective for older populations. Though they are the least likely to use cannabis, older adults often use it to reduce neuropathic pain (common among people with type 2 diabetes), improve quality of life and decrease prescription drug use (including opioids).

Additionally, benefits for patients with age-related diseases, including Parkinson's and Alzheimer's, have also been reported in some studies; however, there is very little research on the long-term effects of cannabis use among this group of people. Another concern about older adults using cannabis is the potential of interactions with other medications, including blood thinners (anti- coagulants), anti-depressants, antipsychotics, antiarrhythmics for heart rhythm abnormalities, and statin drugs, which reduce cholesterol levels.

For people diagnosed with heart disease, cannabis should be used with extreme caution because cannabis increases the heart's need for oxygen at the same time as it decreases available oxygen supply, which could cause angina (chest pain). In addition, in some studies, cannabis triggered a heart attack in people with underlying heart disease. Other studies have linked cannabis use to a higher risk of strokes and heart failure.

Research into the effects of cannabis on the heart and blood vessels has been limited because cannabis is categorized as a Schedule I controlled substance by the U.S. Drug Enforcement Agency (DEA). Schedule I controlled substances are defined as having no accepted medical use, a high potential for abuse and an unacceptable safety profile. The AHA's Scientific Statement suggests that the DEA remove cannabis from the Schedule I of the U.S. Controlled Substances Act so that it can be widely studied by scientists. Forty-seven U.S. states, the District of Columbia,

and 4 of 5 U.S. territories allow some form of cannabis use, and its use has risen considerably over the past decade, particularly among people 18-25 years of age. Although many states have legalized medical and/or recreational cannabis use, cannabis growing, sales and use are illegal at the federal level, further complicating scientific research.

"We urgently need carefully designed, prospective short- and long-term studies regarding cannabis use and cardiovascular safety as it becomes increasingly available and more widely used," Page said. "The public needs fact-based, valid scientific information about cannabis's effect on the heart and blood vessels. Research funding at federal and state levels must be increased to match the expansion of cannabis use—to clarify the potential therapeutic properties and to help us better understand the cardiovascular and public health implications of frequent cannabis use."

Legalization of cannabis for medical purposes should align with patient safety and efficacy. Legalization for recreational use will remain a significant concern until more research can be conducted on the safety and long-term population health effects across the life course and the equity and social justice impact of these laws. In those states where cannabis is legal for recreational or medical purposes, there should be a robust public health infrastructure that is adequately funded and implemented to minimize its impact on CVD mortality especially among young people those who have heart disease. The statement calls for the federal government to create standardized labelling about the amount of THC and CBD and require it on all legal cannabis products.

The Association believes cannabis should be tightly integrated into comprehensive tobacco control and prevention efforts that include age restrictions for purchasing, retailer compliance, excise taxes, comprehensive smoke-free air laws, professional education, screening within the clinical environment—for example, when a patient is admitted to the hospital and routinely screened to avoid medication

interactions or potential toxicity—and coverage of cessation treatment programs by insurers, Medicare and Medicaid. These efforts should be adequately funded, and at least some portion of the revenue from cannabis taxation should be directed toward programs and services that improve public health.

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