Occasional Marijuana Smoking Does Not Impair Lung Function

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Potential good news for marijuana users—occasionally smoking pot did not affect pulmonary function and may actually increase lung airflow rates and lung capacity, according to a new study published in the January 11 issue of The Journal of the American Medical Association (JAMA). Though the study does not speak to the pulmonary effects of marijuana smoking by people living with HIV, the results will likely help guide risk-versus-benefit analyses of marijuana use to alleviate a variety of disease-related symptoms.

Marijuana is the most commonly used illicit drug in the United States, according to the National Survey on Drug Use and Health. In 2009, 16.7 million Americans ages 12 and older reported using marijuana at least once in the month before being surveyed.

Though federal and state laws generally forbid the sale or possession of marijuana, 16 states and Washington, DC, have legalized the medical use of marijuana to help manage the symptoms of many diseases, including those associated with HIV infection and its treatment. (To learn more about state marijuana laws, click here.)

Though the prevalence of marijuana use among people living with HIV isn't known, it is commonly reported by HIV-positive cohort participants. In addition, the potential benefits of marijuana use have been documented in a variety of studies, including reduced nausea, increased appetite, alleviated muscle and nerve pain, and better managed depression and anxiety.

As for drawbacks associated with marijuana use, there is some lingering concern that it can lower blood concentrations of ARVs—thereby making them less effective—and that pulmonary irritation associated with smoking the drug can work in tandem with HIV-related inflammation and potentially increase the risk of bronchitis or lung cancer.

Though the latest data published in JAMA don't address these concerns, they do help settle one lingering question regarding marijuana smoking: Does it progressively worsen lung function and increase the risk of emphysema and other forms of chronic obstructive pulmonary disease (COPD)?

To help answer this question, Stefan Kertesz, MD, of the University of Alabama at Birmingham and his colleagues used a large national database—the Coronary Artery Risk Development in Young

Adults (CARDIA) study—to compare the lung function of marijuana and tobacco smokers during a 20-year period. The cohort consisted of 5,115 men and women, participating through clinics in Birmingham, Chicago, Minneapolis and Oakland, all of whom underwent pulmonary function testing upon entering the study and then 2, 5, 10 and 20 years later.

Lifetime exposure to marijuana joints was expressed in joint-years, with one joint-year of exposure equivalent to smoking 365 joints or filled pipe bowls.

Marijuana exposure was nearly as common as tobacco exposure—37 percent of the participants said they used marijuana at some point during the study—but was mostly light. Among those who smoked tobacco, the average was eight cigarettes a day. Among those who smoked marijuana, the average was two to three joints a month.

The data also revealed that tobacco smoke had exactly the effect shown in all previous studies — increasing a person's cumulative exposure to cigarettes results in loss of airflow and lung volumes; the opposite was true for marijuana smoke.

"At levels of marijuana exposure commonly seen in Americans, occasional marijuana use was associated with increases in lung air flow rates and increases in lung capacity," Kertesz said in an accompanying announcement. He and his colleagues noted that the average FEV1 among healthy adults—the amount of air removed from the lungs during the first second of a forced exhale, an important measure of pulmonary function—is 3 to 4 liters. In their study, FEV1 values tended to decrease among tobacco smokers, whereas it increased by about 50 milliliters (ml) among marijuana smokers.

"Those increases were not large, but they were statistically significant," Kertesz said. "And the data showed that even up to moderately high-use levels—one joint a day for seven years—there is no evidence of decreased air-flow rates or lung volumes."

Pulmonary function values decreased for people who had high levels of lifetime exposure. For example, there was a 2.2 ml reduction in FEV1 for every joint-year beyond 10 joint-years of use, the researchers found. "At that point," Kertesz explains, "the data suggests there is a decline in lung air-flow rate. There also may be other damaging effects that don't manifest until extremely high levels of exposure; we did not have enough very heavy marijuana smokers in this study to determine this."

What sets this study apart from any others is both the number of participants and duration of the study, said Mark J. Pletcher, MD, of the University of California at San Francisco, who oversaw the statistical analysis and is the lead author of the JAMA paper.

"This is not the first study to show that marijuana has a complicated relationship with lung function," Pletcher said. "However, the size of the study and the long duration of follow-up help us to paint a clearer picture of the ways in which the relationship changes over time."

Kertesz added that the study did not examine other ways in which smoking marijuana could affect a person’s health, and he insisted this study does not advocate the use of marijuana. “Marijuana is still an illegal drug, and it has many complicated effects on the human body and its function,” he said. “In our findings we see hints of harm in pulmonary function with heavy use, and other studies have shown that marijuana use increases a user’s likelihood of a heart attack, according to the American Heart Association, and impairs the immune system’s ability to fight disease, according to the National Institute on Drug Abuse.”

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