Cannabis and Strokes: Linked or Not?

By Jamie Wells, M.D. — January 4, 2017

Once again, the echo chamber nature of press releases serves to promote misleading science and health clickbait. This time it is with headlines like “Tobacco, but not pot, boosts early stroke risk.”

First, it is an imprecise conclusion based on the newly published study. Second, the research it refers to downplays the significant flaws and limitations of its own work.

Let’s break down the findings for you to draw accurate (and your own) conclusions. The goal of the work was to determine whether there is an “association between cannabis use and early-onset stroke, when accounting for the use of tobacco and alcohol.”

Who was studied and how was the data acquired? (1)

- Population-based cohort study comprised of 49,321 Swedish men (born between 1949 and 1951) aged 18-20 years old during 1969/70 when conscripted into military service.
- All men—at time of conscription—underwent 2-day screening procedure inclusive of a health examination and completion of 2 questionnaires: 1) substance use, 2) social and behavioral factors.
- In 1969/70, the conscripts were asked about cannabis, alcohol and tobacco smoking habits. Vital signs and a physician assessment were performed then and those with Diabetes Mellitus and Migraines were documented. The researchers linked their data with parental records to assess parental history of death by cardiovascular disease (CVD) and socioeconomic status in childhood based on the father’s occupation.
- Information on stroke events up to around 60 years of age was obtained from national databases; this includes strokes experienced before 45 years of age.
- Participants were followed to assess the initial occurrence of strokes (fatal or nonfatal) from
1971-2009 (between roughly ages 20-59) by collecting information through national public hospital and death record databases.

How was the data analyzed?

- After computation of crude models, the authors estimated a model adjusting for body mass index, systolic and diastolic blood pressure along with the other original (from 1969/70) parameters, additionally adjusting for indicators of socioeconomic status until young adulthood, and additionally adjusting for tobacco smoking and alcohol consumption.

What does *Cannabis, Tobacco, Alcohol Use, and the Risk of Early Stroke: A Population-Based Cohort Study of 45,000 Swedish Men* [2] in the journal *STROKE* claim?

- We found no evident association between cannabis use in young adulthood and stroke, including strokes before 45 years of age. Tobacco smoking, however, showed a clear, dose-response shaped association with stroke. In multivariate-adjusted models, the elevated hazards were attenuated both in relation to heavy cannabis use and high alcohol consumption [3].
- **CONTRACTION:** “Cannabis use showed no association with stroke before 45 years of age” “Crude models demonstrated that the hazard of ischemic stroke until 59 years of age was almost 2 times higher among men who were heavy cannabis users in young adulthood than among nonusers.”
- Although an almost doubled risk of ischemic stroke (2) was observed in those with cannabis use >50 times, this risk was attenuated when adjusted for tobacco usage.
- Smoking more than or equal to 20 cigarettes per day was clearly associated both with strokes before 45 years of age (more than 6 times higher than nonsmokers) and with strokes throughout the follow-up.
- 1037 first-time strokes occurred during the follow-up period until 59 years of age, before age 45 specifically there were 192. Ischemic strokes were significantly more common than hemorrhagic in all categories.
- Most common factors of men with stroke before age 60: parental history of CVD, overweight, poor cardiorespiratory fitness, low socioeconomic position in childhood, short schooling, heavy smoking, high alcohol consumption (in those before 45 risk 4 times higher than nondrinkers).
- High blood pressure and heavy cannabis use seemed to be more prevalent among men having a stroke before 45 years of age but did not differ to the same extent between men with and without stroke when followed until age 60.

The many FLAWS in this study…

- The researchers lacked the knowledge of adulthood levels of abuse or use of cannabis, tobacco and alcohol (or other drugs) along with environmental exposures during the military service and after in their respective occupations and lifestyles.
- No life long or adult disease diagnoses or medication use were included or known (migraine and diabetes were “estimated”)
- Basically, there was no follow-up data to the baseline 1969/70 figures.
• Such statistics are vital to understanding contributions to strokes in later life outside of adolescence
• Their early data required substance abuse self-reporting which is traditionally under-reported and demonstrated lower norms than the previous and subsequent year anonymous data they had from other conscript surveys
• This report makes no reference to the varying ingredients and changes in modern day cannabis or tobacco and so on to those of that era or the intervening time period
• Only military young men were studied. The data may not be able to be generalized to other populations.
• **MAIN PROBLEM:** The cannabis users were routinely tobacco and alcohol users as well—sometimes tobacco is added to cannabis cigarettes (aka joints). The authors used “crude modeling” to eliminate those confounding factors which reflects math magic more than actual reality. **Multi-drug use is a challenge to the attainment of sufficient data to interpret.** The ideal study would compare full-on abstainers as a control group to only cannabis users to only tobacco users to only alcohol abusers by quantifying their varying degrees of use.

**Take Home Messages…**

Epidemiological studies are routinely flawed as associations can be mathematically fit into the desired framework. Otherwise stated, when we look for something we tend to find it. The notion that the method used to eliminate for tobacco or alcohol use, for example, in assessing the cannabis issue as an effective strategy is not one to which I subscribe.

Even an author of the study, Dr. Anna-Karin Danielsson of Karolinska Institutet in Stockholm, revealed to Reuters Health [4]:

“The almost doubled risk of ischemic stroke following heavy cannabis use that was observed in our study disappeared when we controlled for tobacco smoking.” But, she added, the fact that almost all the pot smokers were also tobacco smokers makes it hard “to rule out possible associations between cannabis and stroke.”

There is no doubt—which the authors of this study appreciate—that more research needs to be done on the health effects of cannabis. There is a growing existing body of literature linking cannabis use to stroke especially in young adults. (3) Typically, these are in current or heavy users who also are tobacco smokers. A United States study deemed “cannabis use was associated with a 17% increase in the risk of hospitalization because of acute ischemic stroke, even if both tobacco and amphetamine use constituted bigger risks” while another found its abuse or dependence was linked to ischemic, not hemorrhagic stroke. (4) The National Institute on Drug Abuse is a valuable resource, click here [5].
Once again, exercising, eating and sleeping well, maintaining an optimal weight, pursuing education, and avoiding such substances as marijuana, tobacco smoking along with heavy and binge alcohol consumption [3] will likely best serve all of us and our well-being. As the laws begin changing with respect to marijuana legality and accessibility, the necessary work needs to be done to determine the genuine risks of its use and abuse so as to most aptly inform the public.

NOTES:

(1) The bullet point answers are direct or paraphrased quotes from the study itself [2].

(2) This paper explored ischemic and hemorrhagic strokes, more so the former. Ischemic ones occur when something blocks the flow of blood to the brain like a clot, for example, so that that region of the brain gets deprived of proper nourishment and oxygen and is injured as a result. Hemorrhagic is when too much blood or a massive bleed injures the brain tissue.

SOURCES:

(3) (4) A literature review is included throughout this recent report, click here [2].