Study shows that caffeine does not cause

In a study conducted at Hospital de Clínicas in Porto Alegre, researchers tested the short-term effects of high-dose caffeine

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Researchers from UFRGS and Hospital de Clínicas de Porto Alegre (HCPA) have demonstrated from clinical trials that the consumption of high doses of caffeine does not cause arrhythmia in heart failure patients. The results of the study, published in the journal *Jama Internal Medicine*, challenge the prevailing recommendation that people with heart problems should limit their caffeine intake.

Findings challenge the prevailing recommendation that people with heart problems should limit their caffeine intake – Photo: FreddieBrown/Flickr

The study included 51 patients recruited at HCPA. Before the trials began, participants were instructed not to consume any food or drink that contained caffeine for seven consecutive days. After this period, they were divided into two groups. The first one received five 100 ml doses of decaffeinated coffee mixed with 100 mg of caffeine each, totaling 500 mg of the substance (equivalent to five cups of 150 ml coffee approximately), while the control group received doses of

decaffeinated coffee mixed with lactose. The doses were consumed at intervals of one hour, with continuous monitoring by means of electrocardiogram. One hour after the last dose, patients were subjected to a treadmill stress test to assess whether caffeine could pose a risk of physical exercise. The procedures were performed at the HCPA Clinical Research Center.

After this stage, the patients spent seven more days without caffeine intake and returned to the hospital for the second stage of testing. At that time, the same protocol was maintained, but the groups were reversed – those in the control group started to consume caffeine, and those who ingested caffeine previously consumed the placebos. "In this methodological model, we have, for the same subject and for the same metabolism, the reaction of the two stages, intervention and placebo", explains the doctoral student of the Graduate Program in Cardiology at UFRGS, Priccila Zuchinali, who is one of the authors of the study.

At first, for safety reasons, only patients with an implantable cardioverter defibrillator (ICD) – a small device implanted under the skin that can detect anomalies in the heart rhythm and revert them by electric pulses – participated in the study. As no problems were identified, later those who did not use the equipment were also included. Patients who cannot ingest caffeine or lactose, with physical limitations for the exercise test, in use of drugs to treat arrhythmias, who were hospitalized in the two months prior to the tests, and patients with ICD who had episodes of unstable ventricular arrhythmias in the two months prior to the tests were excluded.

Researchers found no association between caffeine intake and arrhythmia episodes, even during treadmill exercise testing. There were also no significant differences between caffeine and placebo intake or any indication of increased risk of cardiac dysfunction. "In this context, there is no solid evidence to support the common orientation of restricting coffee consumption, a result which may change the approach to heart failure patients. I stress, however, that the long-term effect has not been tested," says Priccila.

The researcher remarked that the motivation for the study, which is also part of her doctoral dissertation, started with the following question: "Do we really need to deprive heart failure patients of their consumption of coffee and other sources of caffeine? Since coffee is a very popular drink, and the common orientation is to restrict its consumption, even without a consensus in the literature of this need, it

is very useful for society to test this assumption in a well-designed study," she says.

Priccila further notes that this was the first study to test the short-term effect of high doses of caffeine in high-risk patients. There have been previous studies, mostly performed in the 1980s and 1990s, which tested the effect of caffeine on arrhythmia in other populations and with lower caffeine doses, but their results are controversial. "Some of the previous studies do not bring important methodological information to ensure scientific rigor," she says, exemplifying the lack of details related to the randomization of the groups, to the "blindness" of the evaluators and participants (which guarantees that neither the patient nor the data collector knows the type of treatment given to each one) and the description of losses (participants who entered the study, but did not complete the observation period).

Priccila also recalls that the study followed the validated protocol Consort (Consolidated Standards of Reporting Trials), designed to guide the execution and writing of clinical trials. "Our work was also quite rigorous over the period of time patients had to refrain from ingesting caffeine sources before the beginning of each phase of the protocol. This time was seven days longer than the other studies, in an attempt to ensure that the observed effect was actually from the caffeine administered during the protocol rather than from prior consumption. "

The researchers also warn that the findings should be interpreted with caution because of the relatively small number of patients included and the fact that only short-term effects of caffeine have been evaluated. "It would be interesting to test this long-term effect, as well as other sources of the substance, such as energy drinks that have, in addition to caffeine, other stimulants," says Priccila.

Scientific paper

ZUCHINALI, Priccila et al. Short-term effects of high-dose caffeine on cardiac arrhythmias in patients with heart failure: a randomized clinical trial. JAMA Internal Medicine, 17 out. 2016.

Translated by Camila Wisnieski Heck, under the supervision and translation revision of Professor Elizamari Becker (IL/UFRGS).