

Coffee: More Than Just a Jolt in the Morning

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Abstract

The long term health effects of drinking different volumes of coffee were investigated. Research was limited to studies that used brewed coffee (not caffeine alone) as the primary variable, and the effects of decaf coffee were not studied. Positive associations include: antioxidative effects, decreased risk for type-2 diabetes, and lower risk of Parkinson's disease. Extreme coffee intake has been associated with increased levels of homocysteine in blood plasma, which is associated with an increased risk for cardiovascular disease. Based on these results, it is clear that habitual consumption of moderate amounts of coffee may provide certain health benefits, while excessive consumption may prove detrimental to health. However, these results only suggest associations that coffee may have with health. More research is necessary before a true cause-effect relationship between coffee consumption and health can be proven. Based on the existing results, I can conclude that moderate coffee intake (2 cups/day or less) may have positive health benefits, and that heavy coffee intake (4 cups/day or more) may have negative effects.

Introduction

About 160 million people in the United States drink coffee, just over half the population (1). Because it contains caffeine, a stimulant, coffee is responsible for increased levels of alertness and focus in millions of Americans every day. Caffeine works because it is molecularly almost identical to the neurotransmitter adenosine. Normally, when adenosine is released it binds to receptors on the neurons in our brain, causing a slow down of nervous system function that we interpret as sleepiness. When caffeine is introduced into the body, it binds to the adenosine receptors, effectively blocking this slow-down effect. Caffeine also activates several neural circuits that cause the secretion of adrenaline, a hormone that gives your body a boost of energy (2). This immediate boost of energy is the reason that many people drink coffee. Caffeine is a habit-forming drug, however, and there have been news reports that coffee drinking can be damaging to your health (1). This popularized opinion, however, does not offer a complete picture of the health benefits of coffee. To millions of people, coffee can be more than just a jolt energy in the morning. My hypothesis is that coffee, when consumed in moderation, can have positive long-term health benefits.

Method

There are many consumer-oriented web sites that discuss the health benefits and risks of coffee. Some of these sites are more legitimate than others, and the accurate ones all take their information from scientific journals. In order to obtain the most accurate, recent, and reliable information, I used peer-reviewed journals almost exclusively in my research. There has been a wide variety of studies done relating to coffee and health. Some studies looked at the effects of coffee on health exclusively, whereas others analyzed the benefits of certain compounds. Polyphenols, for example, are found in many different foods and beverages, including coffee. I used published articles from the following journals in my research: the *Journal of Agricultural Food Chemistry*, *Annals of Internal Medicine*, the *Journal of the American Medical Association*, and the *American Journal of Clinical Nutrition*.

Results

Health Benefit	Details of Study	Conclusions
Antioxidative Effects	Extracts of brewed coffee were analyzed for their antioxidant properties.	"The results indicate that brewed coffee contains many antioxidants and consumption of antioxidant-rich brewed coffee may inhibit diseases caused by oxidative damages." (7)
Lower Risk for Type 2 Diabetes	An 18 year study of both men and women that measured coffee intake, and noted incidence of type 2 diabetes. Took into account age, body mass index, and other diabetes risk factors.	An inverse association between coffee intake and type 2 diabetes was found. According to the authors, "the data suggest that long-term coffee consumption is associated with a statistically significantly lower risk for type 2 diabetes." (6)
Lower Risk of Parkinson Disease	Analyzed 30 years of follow-up data of 8004 Japanese-American men (age 45-68 years) enrolled in the Honolulu Heart Program between 1965 to 1968.	Higher coffee and caffeine intake is associated with a lowered incidence of Parkinson disease (PD). "The incidence decreased from 10.4 per 10,000 person-years for those that drank no coffee, to 1.9 per 10,000 person-years in those that drank at least 28 oz/day." (5) See figure 1 below
J-shaped Association to Cardiovascular Disease Risk	The coffee intake of 848 patients who had their first "coronary heart disease event" was compared with 1078 controls who had no history of cardiovascular disease.	Relative to no consumption of coffee (odds 1:1) the odds of cardiovascular disease decreased when coffee consumption was 2 cups/day (.69:1). The odds doubled when consumption was 2-4 cups/day (1.56:1), and again when consumption was 4 or more cups/day (3.10:1). (4) See figure 2 below

Photo courtesy: A

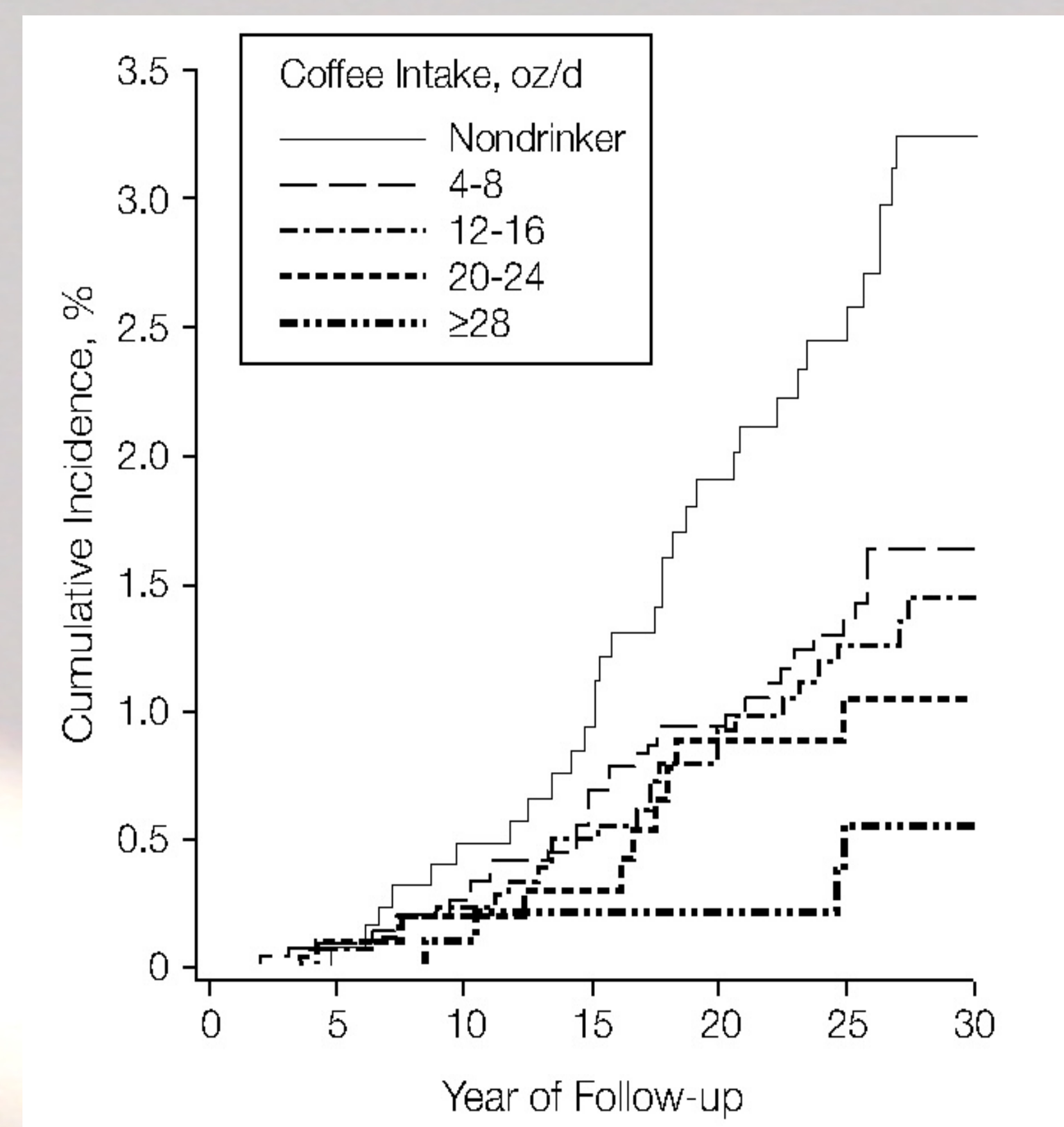
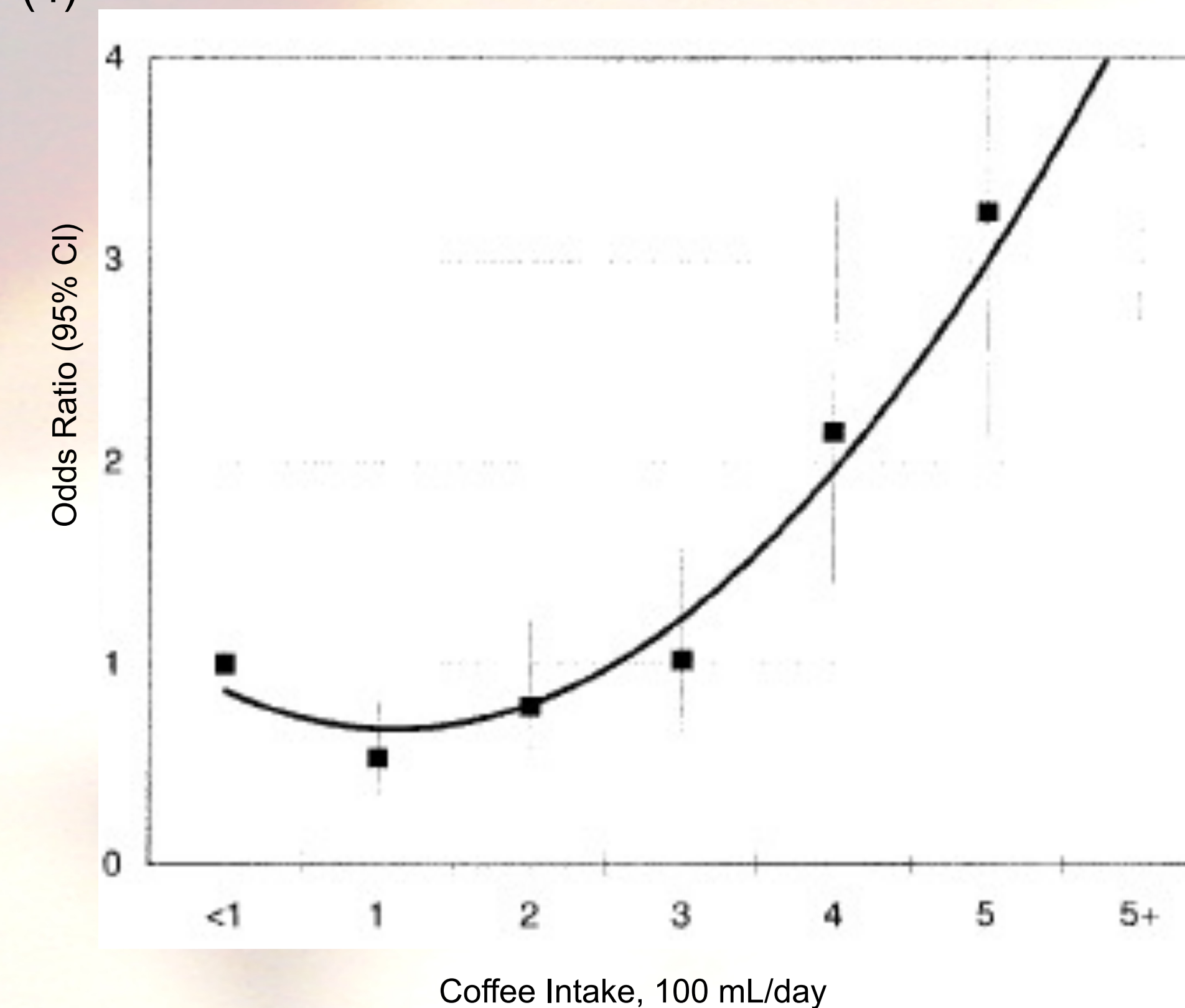


Figure 1 (above) Cumulative Incidence of Parkinson Disease

During the course of the study, the incidence of Parkinson disease is noted based on coffee intake in ounces/day. Note that the incidence of the disease is highest among nondrinkers, and lowest among those who drank the most coffee—28 oz/day or more. (5)

Figure 2 (below) Cardiovascular disease risk and Coffee Intake

Estimations of the odds ratio of developing acute coronary symptoms based on coffee intake. Note how a lower and higher intake of coffee are associated with a higher risk, whereas a moderate intake (approx. 2 cups/day) results in a lowest risk. (4)



Discussion

Based on the scientific evidence now available, it can be said that drinking coffee in moderation is okay, and most likely beneficial. Drinking more than 4 cups a day, however, may pose a risk. It is clear that coffee contains ingredients, like polyphenols, known to have antioxidant properties (3). What is not yet known completely is exactly how or why antioxidants work to prevent disease in the body. So while it cannot be said that coffee will cure or prevent any diseases, there is evidence to suggest that it may have a positive effect on health. However, these results only propose *associations* that coffee may have with health. More research is necessary before a true cause-effect relationship between coffee consumption and health can be proven.



Photo courtesy: B

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