Heart Mirror Journal
From Affiliated Egyptian Universities and Cardiology Centers

Vol. 6, No. 2, 2012
ISSN 1687-6652

EDITORIAL

Can I Sip My Coffee?
A Coffee a Day Keeps the Doctor Away!

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The quotation of Ben Franklin; "early to bed, early to rise, makes a man healthy wealthy and wise" (1), looks really wise, sound to our minds and may drive us to change our life style according to its meanings. However, any quotation can be antagonized by another quotation as James Thurber quotation; "early to rise and early to bed makes a male healthy and wealthy and dead" (2). The meaning and linguistic composition of both are very attractive. But, you cannot prove either of them as they look like philosophical ideas. However, to know which one of these questions is truly correct, Mukamal, et al. studied 949 men admitted to hospital with acute myocardial infarction. They found that the mortality of early-to-bed, early-to-risers patients did not differ significantly from other groups (3).

How many cups of coffee should I take each day? A common simple question asked by patients or healthy subjects to their treating physician in any field of medicine. The common expected replay is more relaxing as Ben Franklin's previously mentioned quotation; you should stop or reduce your coffee consumption because it is harmful on the short and long run to your health! This question was asked over the last thirty years in the medical literature and its answer was markedly controversial in the past.

Coffee Beans

Coffee originated in the 9th century in Ethiopia when a shepherd began consuming wild coffee berries after observing that his goats had increased energy after eating them (4). It was not until the late 1800's that caffeinated soft drinks began appearing with the introduction of Dr. Pepper, followed by Coca-Cola and then Pepsi-Cola (5).

There are two main species of coffee trees, Coffea Arabica and Coffea Robusta. The two species differ in chemical composition of the green coffee bean. Arabica contains more lipids and Robusta contains more caffeine. Due to the fact that Arabica has a more desirable flavor, this variety constitutes 80% of the world trade. Robusta is often used in instant coffee (6).

Coffee contains three ingredients that are important; caffeine, the diterpene alcohols cafestol and kahweol, and chlorogenic acid and other polyphenols. Caffeine is found in common beverages including coffee, tea and soft drinks, as well as products containing cocoa or chocolate, and a variety of medications and dietary supplements (7). Caffeine is rapidly and completely absorbed and eliminated with an average half-life of 5h (8). Many studies confirm caffeine's ability to enhance mood and alertness (9, 10), exercise performance (11). In excess, caffeine leads to a state of excitement and anxiety (12). Dose–responses vary, for some people even a single cup may cause sleeplessness with a racing mind. For others, through tolerance to increasing exposure, drinking ten times this amount may still be pleasant, partly reflecting genetic variation in susceptibility (13).

Coffee is among the most widely consumed beverages in the world (Figure 1) (14). Coffee has recently been recommended by a US review panel to be consumed along with tea in greater quantities than all other beverages including caloric beverages such as milk, non-calorically sweetened beverages, fruit and vegetable juices, alcohol, sports drinks and calorically sweetened, nutrient poor beverages (15).

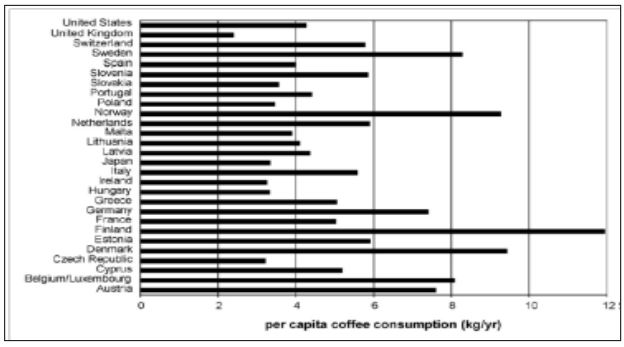

Figure 1: Percentage of coffee consumption per capital (year 2005). Finland has the highest rate of consumption, while England shows the lowest rate.

Coffee and the General Health

Cohort studies and large meta-analysis do not support a positive association between coffee drinking and mortality, and some even suggest a modest inverse

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association (16-23). The largest most recent prospective cohort study by Freedman, et al. (2012) (23) on the association of coffee drinking with total and cause-specific mortality was conducted among 229, 119 men and 173, 141 women, during 5, 148, 760 person-years of follow-up. They found the risk of death was increased among coffee drinkers. This was due to the fact that coffee drinkers were also more likely to smoke, and, after adjustment for tobacco-smoking status and other potential confounders, there was a significant inverse association between coffee consumption and mortality. As compared with men who did not drink coffee, men who drank 6 or more cups of coffee per day had a 10% lower risk of death, whereas women in this category of consumption had a 15% lower risk. Inverse associations were observed for deaths due to heart disease, respiratory disease, stroke, injuries and accidents, diabetes, and infections. Results were similar in subgroups, including persons who had never smoked and persons who reported very good to excellent health at baseline.

The beneficial effect of caffeine was noticed in patients with Parkinson's disease (PD). It improves the deterioration of gross and small motor skills, and tremors (24). Caffeine has also been found to play a preventative role against the onset of PD. A large prospective study in men showed an inverse relationship between PD and consumption of coffee, caffeine from non-coffee sources, and tea (25).

It is also suggested that individuals who consume coffee may have a decreased risk of cerebral infarction. Chronic consumption of coffee may contribute to reduced platelet activation and plasma C-reactive proteins in males (21).

During pregnancy, results are conflicting in relation to the association of increased caffeine intake and fetal growth restriction and low birth weight. The main concerns are possible association with spontaneous abortion and impaired fetal growth (26). Pregnant woman should limit their caffeine intake to ≤300mg/d (27). In addition, pregnant women are advised to drink no more than 2 cups of coffee or 4 cups of tea per day (28).

There was a clear inverse relationship between coffee consumption and serum uric acid but none with green tea (29). Another area in which caffeine may play a positive role is in the prevention of sunlight-induced skin cancer (30).

Patients with liver cirrhosis should reduce their caffeine intake since it is metabolized mainly by the liver (31).

Type 2 Diabetes Mellitus

The majority of studies found an inverse relationship between caffeinated coffee and type 2 DM. The risk of type 2DM was 35% lower in those who consumed at least 6 cups/d of coffee and 28% lower in those who consumed between 4 and 6 cups/d compared to those who consumed less than 2 cups/d (32). Two U.S. cohort studies examined both regular and decaffeinated coffee separately (23, 33). They concluded that a significant inverse association existed between regular coffee consumption and a risk for type 2 DM, whereas only a modest inverse association was seen with decaffeinated coffee.

In postmenopausal women, there was a 22% lower risk of type 2 diabetes mellitus for those who consumed 6 or more cups of coffee per day, in comparison to women who reported 0 cups of coffee per day (34). Caffeine's inverse relationship with diabetes is probably due to its antioxidant properties and the enhancement of insulin sensitivity. Glucose metabolism in the presence of caffeine increases the expression of uncoupling proteins and lipid oxidation. These effects lead to a decrease in glucose storage thereby decreasing the risk for diabetes (35).

Cardiovascular Disease

Blood pressure; an acute effect of caffeine intake in the general population is an increase in blood pressure, which was more prominent in hypertensive individuals (36, 37). However, the literature on coffee and hypertension has recently been critically reviewed, interestingly no association of caffeine with risk of hypertension was found in the 10 year Nurses Health Study I and II, nor were there any effects of coffee on hypertension (38, 39).

Cholesterol and LDL; coffee increase total cholesterol by about 2mg/dl for one cup of regular coffee per day (40). There was an identified dose-response relation between coffee consumption and both total cholesterol and LDL cholesterol. However, more recently consumption of unfiltered, but not filtered, coffee increases serum levels of total and LDL cholesterol (41).

Coronary heart disease (CHD); data from 2 separate meta-analyses, although performed over a decade ago, showed that coffee increased risk of developing CHD than those who drank no coffee (42, 43). However, more recently the results from a prospective cohort study found no association between caffeine and CHD (44).

In the largest epidemiological study done to date (18), long-term habitual coffee consumption was followed for 16–20 years in over 44,000 men and 85,000 women free of CHD to assess heart disease risk in the US Physician's and Nurses Health Study. There was no effect of coffee on risk even at >6 cups/day. A recent meta-analysis (44), on thirteen case-control and ten cohort studies followed from 3–44 years. There were no significant differences when considering the regions studied, or the type of coffee, filtered or unfiltered. The authors concluded that "despite

a significant association between high consumption of coffee and CHD reported among case–control studies, no significant association between daily coffee consumption and CHD emerged from long-term follow-up prospective cohort studies".

There was no association of coffee with postinfarction mortality (45), even among the heaviest coffee drinkers (46). This was attributed to inflammatory inhibition and thus reduces the risk of cardiovascular and other inflammatory diseases as was seen in the studied postmenopausal women (47).

Heart rhythm; several studies showed that moderate coffee or caffeine intake (5 to 6 cups daily) did not increase the frequency or severity of cardiac arrhythmias (48, 49). Even an inverse relation of coffee and caffeine intake to hospitalization for any type of arrhythmias was observed (50). Frost and Vestergaard (51) described the association of caffeine intake with the subsequent incidence of atrial fibrillation or flutter in almost 48,000 participants in the Danish Diet, Cancer, and Health Study. The amount of caffeine consumed per day was not associated with risk of either atrial fibrillation or flutter.

Turkish or Western Coffee

Turkish or Greek coffee is the most consumed type of coffee beverage in the Middle East, including Egypt and other Balkans countries. It is considered non-filtrated coffee, while most of the western coffee is filtrated either by paper or metal method.

Caffeine has no effect on the blood lipid, however, diterpene compounds present in coffee beans mainly cafestol are responsible for the cholesterol-raising effect. Diterpenes is nearly removed in the American-style "drip" coffee, because paper filters trap these compounds (52-54). The highest levels are present in Scandinavian-style boiled coffee (55) followed by Turkish/Greek coffee, French-press coffee, and then espresso. Other studies showed that the process of coffee decaffeination does not remove cafestol (52, 54). A medium size retrospective study in Greece, showed a high correlation of LDL cholesterol level and CHD in those who are heavy Turkish/Greek coffee consumers (55).

Based on the current review, we can suggest that if you enjoy coffee, do not hold back, it is generally good to your health. But, be cautious about your blood lipid profile if you are heavy boiled or Turkish coffee consumer. We also advise you to insist knowing the caffeine content of each brand of the served coffee, especially if coffee makes you feel "hyper" or you suffer easily from insomnia. Lastly, the answer of the article title question will be: Of course "yes" enjoy sipping your cup of coffee.

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