Coffee and fatigue

Fatigue or tiredness is described as a lack of, or decreased, energy, and physical or mental exhaustion. It is suggested that at any given time, 1 in 5 people feel unusually tired and 1 in 10 have prolonged fatigue[93]; and it is reported that 5-7% of encounters with a doctor are fatigue related[94].

A reduced level of concentration, associated with fatigue, has the potential to cause issues in everyday life. In this topic we consider the broad role of coffee in addressing fatigue.

Coffee, caffeine and alertness

Coffee drinking is associated with feelings of alertness[1] and has a role in counteracting some of the symptoms of fatigue[95].

The main active component in coffee is caffeine, a natural compound found in a number of plant species including coffee, tea and cocoa[96]. A typical cup of coffee contains 75-100mg caffeine, whilst levels in brewed tea and cocoa are lower[96,97,98]. The European Food Safety Authority (EFSA) has concluded that a cause and effect relationship has been established between a 75mg serving of caffeine – the amount found in approximately one regular cup of coffee – and both increased attention (concentration) and alertness, mainly in situations of low arousal[1].

Research has suggested that the consumption of 100mg caffeine leads to higher ratings of alertness and overall mood and lower mental fatigue ratings[95]. Tiredness and headache ratings were also lower following regular coffee compared to placebo and decaffeinated coffee[95].

Coffee caffeine and fatigue in daily life

There are a number of circumstances in daily life when caffeine consumption may help to improve feelings of alertness, such as driver fatigue, coping with jet lag and general alertness for instance in the workplace [15,58,99]. The effects of caffeine on alertness are often clearest in situations where an individual's fatigue is increased and alertness reduced, such as when suffering from the common cold[100], or working at night[15].

Night work

Fatigue is a potential issue for those who work night shifts. During night work, caffeine has been shown to reduce cognitive failures and accidents by about half in subjects consuming over 220mg caffeine daily[15].

In some individuals sleep may be affected by caffeine consumption, and there is an association between a daily intake of caffeine, reduced sleep quality, and increased daytime sleepiness[35,36]. A review of research on coffee, caffeine and sleep suggested that individuals

respond differently to caffeine based on a variety of factors, including age, sensitivity levels, regular coffee and caffeine intake, time of consumption and genetic variability[36]. Individuals who find that caffeine affects their sleep are advised to avoid it in the hours before bedtime.

Jet lag

Jet lag may be experienced after a long haul flight across different time zones and can cause extreme sleepiness or wakefulness at inappropriate hours. To counter jet lag, it helps to adjust to the new time zone quickly, sleeping, waking and eating at times appropriate to that area[85,101,102].

Coffee consumption is associated with increased alertness[1] and may help to manage fatigue in those who experience jet lag[85,101,102], further information is available here

Driver fatigue

Driver fatigue is an issue that can affect all drivers. Fatigue and sleepiness reduce reaction time, vigilance, alertness and concentration so that the ability to perform attention-based activities, such as driving, is impaired. The speed at which information is processed is also reduced by sleepiness and the quality of decision-making may also be affected[103].

Research by the European Commission has found that a person who drives after being awake for 17 hours doubles their risk of crashing[104]. Despite this, 23% of drivers say they have felt extreme fatigue whilst driving and 3% have fallen asleep at the wheel[104].

Research suggests that drinking strong coffee containing 150 -200mg caffeine together with a short nap is effective at reducing driver sleepiness[18,20].

Fatigue is also an issue in those who drive commercial vehicles. Research in long distance lorry drivers suggests that 43% of drivers reported consuming caffeinated drinks, such as coffee, tea, and energy drinks or taking caffeine tablets, to stay awake[22]. After adjusting for confounding factors, including age, sleep patterns, driving distance and number of breaks, drivers who consumed these products for this purpose had a 63% reduced likelihood of crashing[22].

Caffeine and fatigue in sports performance

Research suggests that caffeine may help to improve physical performance during both endurance and high-intensity exercise[105, 106, 107]. The European Food Safety Authority (EFSA) concluded that there is an association between caffeine consumption and an increase in endurance performance, endurance capacity and a reduction in the rated perceived effort or exertion during exercise[108].

Although much of the research has been undertaken in trained athletes, studies in sedentary people and those with lower levels of fitness also suggest that caffeine can improve performance in those who are not trained athletes[109,110].

Hydration and fatigue

Fatigue is also closely linked with levels of hydration. Research suggests that consistent effects of mild dehydration include confusion, anger and fatigue[111].

Fluid in the body is important: EFSA has concluded that a cause and effect relationship has been established between the dietary intake of water and the maintenance of normal and physical cognitive function[112]. Whilst there is some indication of a short-term diuretic effect of caffeine intake, this effect does not counter-balance the effects of the fluid intake from coffee drinking[113-118]. Drinking caffeinated coffee in moderation can help to maintain adequate fluid balance[113-118].

Coffee and caffeine intakes

A moderate intake of coffee (3-5 cups per day), spread appropriately throughout the day to suit the lifestyle of an individual can help to address feelings of fatigue in everyday situations including alertness in the workplace or whilst driving. Those who are sensitive to caffeine and find it affects their sleep patterns can avoid caffeine and coffee in the hours before sleep.

The European Food Safety Authority (EFSA) in a review on the Safety of Caffeine concluded that a moderate caffeine consumption, of up to 400mg caffeine per day (the equivalent of up to 5 cups of coffee), can be enjoyed as part of a healthy balanced diet and an active lifestyle[119]. Pregnant and breastfeeding women are advised to limit their caffeine intake to 200mg per day[119].

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