

PANDORA'S
BOX

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*Drink your tea – it can help you live longer*

Tea competes with coffee in consumption worldwide. Pandora has previously extolled the health benefits of regular coffee drinking, in moderation. It is time to find out whether tea has similar benefits. Previous studies have focused on green tea, which is more commonly consumed in Asian countries, with black tea studies being inconclusive

A recent prospective cohort study using the UK Biobank examined this very question. The participants were 498 043 men and women aged 40–69 years who had completed the baseline questionnaire from 2006 to 2010. Self-reported black tea intake (portion size and tea strength were not reported) and all-cause mortality (cancer, cardiovascular disease, stroke and respiratory disease) obtained from a linked database from the UK National Health Service were used as measurements. The data showed that during the follow-up of 11.2 years, tea drinking (two or more cups per day) was modestly associated with all-cause mortality risk, compared with no tea drinking (9% to 13% lower risk in tea drinkers). Interestingly the results were similar irrespective of whether the subjects also drank coffee or not and of the genetic rate of caffeine metabolism. Tea temperature, addition of milk or sugar also had no influence.

The authors concluded that consuming two or more cups of tea a day irrespective of genetic caffeine metabolism can be part of a healthy diet.

Inoue-Choi N, Ramirez Y, Cornelis MC, Berrington de González A, Freedman ND, Loftfield E. Tea consumption and all cause-specific mortality in the UK Biobank, a prospective cohort study. *Ann Intern Med* 2022; **175**(9): 1201–11.

Ignore climate change and growing inequalities to our peril

A sobering report from the United Nations (UN) shows a striking, global hunger increase in the past few years; 828 million people were affected by hunger in 2021, an increase of 46 million since 2020 and 150 million since the emergence of the Covid-19 pandemic. Sadly, this is a major setback to the plan to end hunger, food insecurity and malnutrition by 2030 (Agenda for Sustainable Development, adopted by all UN member states, 2015). Seventeen Sustainable Development Goals were agreed, and member states (both developed and developing) were urged to take urgent action to end poverty and other deprivation and to develop strategies to improve health and education, reduce inequality and spur economic growth, as well as simultaneously tackling climate change and preserving our oceans and forests.

The UN reports on the intensification of the major drivers of food insecurity and malnutrition, which include conflict, climate extremes and economic shocks, alongside increasing inequalities in

the world. According to the five UN agencies (in this year's Foreword), 'the issue at stake is not whether adversities will continue to occur or not, but how we must take bolder action to build resilience against future shocks'.

The World Health Organization (WHO) Director-General, Tedros Adhanom Ghebreyesus, states 'every year 11 million people die due to unhealthy diets. Rising food prices mean this will only get worse. WHO supports countries' efforts to improve food systems through taxing unhealthy foods, in subsidising healthy options, protecting children from harmful marketing and ensuring clear nutrition labels. We must work together to achieve the 2030 global nutrition targets, to fight hunger and malnutrition and to ensure that food is a source of health for all'.

Poverty is associated with health inequalities (including mental health), and this has been made more apparent worldwide in the past couple of years with the Covid-19 pandemic. Foodbanks have become the norm in many high-income countries, as the gap between the very rich and the poor continues to widen.

United Nations. *Global Hunger Numbers Rose to as Many as 828 Million in 2021*. UN, 2022. Available from: <https://www.un.org/africarenewal/magazine/july-2022/global-hunger-numbers-rose-to-many-828-million-2021>.

Encouraging research findings for people with binge eating disorder

Binge eating disorder, the most common eating disorder, is associated with loss of control (LOC), which is characterised by the loss of inhibitory response to cravings. It is also associated with obesity, impaired quality of life and premature mortality.

Attempts have been made to identify a biomarker for craving, and research in mice has found that high-fat food reward was associated with increased low frequency oscillations in the nucleus accumbens (NAc). Further research in other animal species has led to reports of electrophysiological, neurochemical and functional neuroimaging activities involving the NAc, which correlate with reward anticipation and predict behaviour outcome.

A recent proof-of-concept study in humans aimed to characterise the human NAc electrophysiology of craving as it relates to LOC. They carried out behavioural tasks in a clinical setting and also away from the clinical environment. They assessed the effects of rDBS (deep brain stimulation) in two subjects. The study was performed under US Food and Drug Administration (FDA) Investigational Device Exemption G180079, using the NeuroPace Responsive Neurostimulation system.

The researchers initially assessed each individual's LOC by modelling the at-risk environment in a controlled setting and rating the severity on a 1–5-point Likert scale, during presentation of a high-calorie buffet of the person's preferred

food; at the same time they recorded synchronised video-NAc local field potential activity. They found that low-frequency power increased immediately before LOC eating, with an increase in the left ventral NAc low frequency (2–8 Hz). In two of the subjects with severe obesity, after 6 months, rDBS of Nac triggered by low-frequency power was associated with an improvement in LOC eating, as well as reductions in weight and body mass index. Importantly, the research captured a signal that was different from the signal occurring during eating. Encouraged by their results and particularly by having shown a potential clinical effect of their intervention in the two participants involved, the authors continue their work on the subject with the support of the FDA.

Shivacharan RS, Rolle CE, Barbosa DAN, Cunningham TN, Feng A, Johnson ND, et al Pilot study of responsive nucleus accumbens deep brain stimulation for loss-of-control eating. *Nat Med* 2022; **28**(9): 1791–6.

Can sleep EEG abnormalities help people with 22q11.1 deletion syndrome?

Young people with 22q11.1 deletion syndrome (22q11.2DS) are at higher risk of a variety of mental conditions, including schizophrenia, intellectual disability, attention-deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD). In addition to these conditions, this genetic abnormality is thought to be associated with sleep problems. Researchers from the University of Bristol and Cardiff University, UK, together with Boeringer Ingelheim, Germany, investigated this association in a recent study.

Using a cross-sectional design, they recorded high-density sleep electroencephalogram (EEG) in young people aged 6 to 20 years who had 22q11.2DS (28 subjects) and their unaffected siblings (17 subjects), measuring associations between sleep architecture EEG oscillations, i.e. spindles and slow waves, and psychiatric symptoms, as well as performance on a memory task.

They found an association between the presence of 22q11.2DS and significant alterations in sleep architecture compared with unaffected siblings. These consisted of broad-band increases in EEG power (slow-wave and spindle amplitudes, increased spindle frequency and density, and stronger coupling between spindles and slow waves). There was a positive correlation between spindle and slow wave amplitude in unaffected siblings but a negative one in the siblings with 22q11.2DS. Using mediation analysis, the researchers found that the effects of the

22q11.2DS genotype on anxiety, ADHD and ASD were partially mediated by sleep EEG measures. They concluded that sleep EEG features may reflect delayed or compromised processes in this genotype, informing our understanding of the neurobiology of the condition and potentially identifying biomarkers of neuropsychiatric disorders.

Donnelly NA, Bartsch U, Moulding HA, Eaton C, Marston H, Hall JH, et al Sleep EEG in young people with 22q11.2 deletion syndrome: a cross-sectional study of slow-waves, spindles and correlations with memory and neurodevelopmental symptoms *eLife* 2022; **11**: e75482.

Take vitamin B6 and reduce your anxiety

B vitamins, in particular B6 and B12, are known to be involved in neurometabolic processes, decreasing neural excitation and increasing inhibition. A recent double-blind study examined the effects of these vitamins on a number of behavioural outcome measures connected to the balance between neural inhibition and excitation. The researchers recruited 478 young adults, of whom 265 self-reported anxiety and 146 depression. The participants were assessed at baseline and after supplementation. Several sensory measures were used as assays of inhibitory function; these were assessed only after supplementation with the vitamins. The subjects were given B vitamins while viewing visual stimuli designed to activate inhibitory and excitatory mechanisms in the visual cortex. The measures used were suppression of visual contrast detection, binocular rivalry reversal rate and a battery of tactile sensitivity tests.

The researchers found that vitamin B6 supplementation reduced self-reported anxiety, and there was also a trend towards reducing depression as well as surround suppression of visual contrast detection. There was no effect on any of the other outcome measures. B12 supplementation produced trends only towards changes in anxiety and visual processing. The authors concluded that high-dose vitamin B6 supplementation increases inhibitory gamma-aminobutyric acid (GABA) neural influences; this is consistent with the known role of the vitamin in the synthesis of GABA, as B6 is a coenzyme involved in the synthesis of GABA, an inhibitory neurotransmitter.

Field DT, Cracknell RO, Eastwood JR, Scarfe P, Williams CM, Zheng Y, et al High dose vitamin B6 supplementation reduces anxiety and strengthens visual surround suppression. *Hum Psychopharmacol* [Epub ahead of print] 19 Jul 2022. Available from: <https://doi.org/10.1002/hup.2852>.