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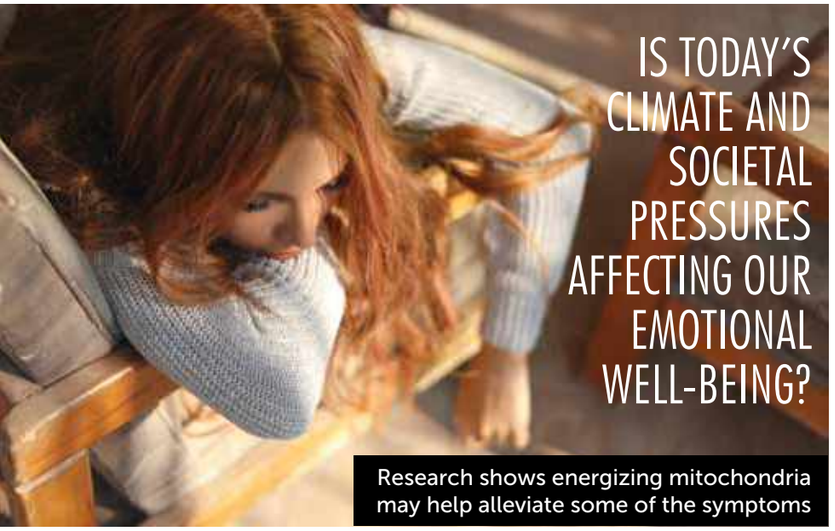

IS TODAY'S CLIMATE AND SOCIETAL PRESSURES AFFECTING OUR EMOTIONAL WELL-BEING?

Research shows energizing mitochondria may help alleviate some of the symptoms

The Mental Health Foundation in the United Kingdom defines stress as the degree to which you feel overwhelmed or unable to cope as a result of pressures that are unmanageable.[1] In a recent article for the World Economic Forum, Dr. Elke Van Hoof, professor, health psychology and primary care psychology at Vrije Universiteit in Brussels wrote that with some 2.6 billion people around the world being in some kind of lockdown in response to the coronavirus (COVID-19) global pandemic, the arguably largest psychological experiment ever is being conducted. Hoof suggests that "this will result in a secondary epidemic of burnouts and stress-related absenteeism in the latter half of 2020."[2]

While stay-at-home orders are being lifted and people are emerging from months of social restrictions as of press time, many may still feel stressed and uncertain about the state of the world, whether it's economic conditions, employment status, reduced socialization, travel restriction or the looming threat of a second wave of the virus this fall. The likelihood of developing a wide range of symptoms of psychological stress and disorder, including low mood, insomnia, stress, anxiety, anger, irritability, and/or emotional exhaustion, are significant.[3]

A variety of experts have shared their research about, interpretation of, and opinion on how to address stress, anxiety, and fatigue, both before the coronavirus and since the pandemic. It's generally accepted that proper sleep, diet, exercise and maintaining a positive environment can help manage these mental health conditions, but sometimes the body also benefits from a supplemental boost.

In order to understand how and why the body benefits from supplements, look no further than the powerhouse of the cell: mitochondria.

How Mitochondria Work

Mitochondria is an essential organelle within the body's cells, essentially having a vast impact on the whole body and creating energy from oxygen and nutrients.

When mitochondria are functioning properly, they generate 36 ATP from a molecule of glucose (ATP stands for adenine triphosphate and is the energy the body needs to live.) If the mitochondria are not working well, it can only generate two ATP per molecule of glucose. Nicotinamide adenine dinucleotide (NAD) is a vital coenzyme that is present in every cell and is an essential reduction-oxidation (redox) cofactor as well as a cosubstrate for many enzymes. Within the mitochondria, NAD+ accepts electrons from a variety of sources and transfers them to complex I of the electron transport chain, resulting in the generation of ATP.

NAD+ also plays a key role in mitochondrial function via participation in pyruvate dehydrogenase, tricarboxylic acid cycle, and oxidative phosphorylation chemistries. As the body ages, NAD+ levels diminish. Exercise, however, can increase NAD+ levels as it causes the body to burn NADH, thus generating more NAD+ along the way.

Mitochondrial biogenesis, the division and growth of cells, and mitophagy, the removal of damaged mitochondria, are processes critical because they regulate the cell, maintaining a healthy balance. Mitochondrial biogenesis is influenced by environmental activity such as exercise, caloric restriction, low temperature, oxidative stress, cell division and renewal and differentiation and is accompanied by variations in number, size and mass.[4] A healthy body continually creates new mitochondria. However, over time, the body's mitochondrial function declines, much like overall energy levels, which can lead to impaired functioning of the brain and other vital organs. Thus, it's important that mitochondria adequately supply energy to address mood, including stress, anxiety and fatigue.

Sleep, Diet, Exercise and Environment

A research study at the University of Basel revealed the relationship between the circadian rhythm and the mitochondrial network and that cellular energy metabolism follows the rhythm of the circadian clock. Additionally, the mitochondrial network loses its rhythm if the circadian clock is impaired, which causes a decline in energy production in the cells.[5]

It is recommended that a healthy adult receive between 7-9 hours of sleep daily for the body to function properly. To help improve sleep, licensed clinical social worker Linda Esposito suggests going to bed early and waking up 15 minutes early. "Go slowly and set yourself up for a relaxed day ahead. If you start to worry about the to-do list, take a deep breath and think: There is enough time," said Esposito. Another study's research found that the use of light-emitting electronics such as smart phones and tablets before bedtime prolongs the time it takes to fall asleep, delays the circadian clock, suppresses levels of the sleep-promoting hormone melatonin, reduces the amount and delays the timing of REM sleep, and reduces alertness the following morning.[6] As such, sleep experts recommend limiting use of such devices before bed.

There is also a growing amount of evidence showing how food can affect one's mood. Feelings of wellbeing can be protected by ensuring one's diet provides adequate amounts of nutrients including essential vitamins and minerals, as well as water. In a recent study, researchers conducted a systematic review and meta-analysis examining effects of dietary interventions on symptoms of depression and anxiety. The study concluded that a poor diet can be detrimental to mental health. Emerging evidence suggests that diet may influence the onset of mood disorders and specifically depression and as such, dietary interventions hold promise as a novel intervention for reducing symptoms of depression across the population.[7]

Esposito suggests eliminating soda, reducing caffeine, sugar and processed foods while adding a healthy dose of greens to your daily intake, can help reduce anxiety. Other health experts advise incorporating mitochondria building foods such as berries, green tea, apples, and grass-fed meats into your diet.

A study found that aerobic exercise, specifically high-intensity interval training, such as biking and walking, caused cells to make more proteins for their energy-producing mitochondria and their protein-building ribosomes.[8] Harvard Medical School also recommends relaxation techniques to reduce stress including deep abdominal breathing, mindfulness meditation, and yoga.[9]

The environment in which one lives, works and functions in, whether physical or psychological, can also greatly affect one's mental health. Meditation and yoga have been shown to clear the mind, but one's physical space is also equally as important. It's not necessary to do a complete Marie Kondo of your living space, but the May Clinic suggests decluttering your space could make you healthier and happier.[10] Esposito also recommends adding lavender as a natural remedy to reduce anxiety and other nervous conditions. Whether it's adding it to the bath or placing it under the pillow at night or applying it to the skin, there is a wide range of ways to incorporate lavender into one's routine to ease stress and anxiety.

Boosting Mitochondria

A balanced diet, proper sleep, exercise, and positive environment can help boost mitochondria, but sometimes, the body needs that extra boost. Thankfully, there are supplements available that can enrich the body's internal environment to repair, regenerate, and support mitochondria. Extensive research into the compound pyrroloquinoline quinone (PQQ) has found it can safely stimulate mitochondrial biogenesis. PQQ is found in trace amounts in vegetables, fruits, meat, and in human breast milk.

MGCPQQ® is an all-natural mitochondrial boosting ingredient added to many supplements. It is the only brand of PQQ lawfully available in Europe for food consumption. Studies suggest MGCPQQ can help to increase mitochondria and activate mitochondrial biogenesis, which results in the growth of mitochondria clusters in cells.[11]

In an open-label study, MGCPQQ revealed positive effects on stress, fatigue, and sleep. The results demonstrated that all six measures of vigor, fatigue, tension-anxiety, depression, anger-hostility, and confusion improved significantly after the test subjects took 20 mg of MGCPQQ daily for eight weeks. Additionally, measures for quality of life, appetite, sleep, obsession, and pain also improved considerably among both male and female subjects during this same time period.[12]

MGCPQQ is manufactured in Japan through a proprietary fermentation process by Mitsubishi Gas Chemical. Unlike other ingredients, it is not derived through a synthetic process. While there are other naturally fermented PQQ ingredients on the market, MGCPQQ remains the most researched and studied for its safety and efficacy.

A safety evaluation was conducted and approved by the European Food Safety Authority (EFSA). After completing and publishing its evaluation, MCGPQQ became the only ingredient of its kind to appear on the European Union's approved list of Novel Foods. In Japan, it is certified by the Ministry of Health, Labour and Welfare as a food ingredient. The company has marketed the ingredient under the brand name BioPQQ® in the United States, Canada and Japan.

These are unprecedented times and the entire world is trying to navigate the new normal. With the possibility of a second pandemic wave impacting millions, mental health has become a top priority for consumers and professionals alike. To address these issues, it's important to keep the body's mitochondria energized to boost energy, improve mood, and lower stress and fatigue. Extensive research has demonstrated that mitochondrial enhancing supplements like MGCPQQ are a safe and effective option to incorporate into one's daily routines to help increase mitochondrial production and health as we age. ●

To learn more about the many benefits of this ingredient, visit www.MGCPQQ.eu.

References

1. https://www.mentalhealth.org.uk/a-to-z/s/stress
2. https://www.weforum.org/agenda/2020/04/this-is-the-psychological-side-of-the-covid-19-pandemic-that-were-ignoring/
3. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30460-8/fulltext
4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3883043/
5. https://www.sciencedaily.com/releases/2018/03/180306093116.htm
6. https://www.pnas.org/content/112/4/1232
7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6455094/
8. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5423095/
9. https://www.health.harvard.edu/mind-and-mood/six-relaxation-techniques-to-reduce-stress
10. https://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/how-decluttering-your-space-could-make-you-healthier-and-happier/art-20390064
11. https://pubmed.ncbi.nlm.nih.gov/29185343/
12. M. Nakano, et al., "Effects of Oral Supplementation with Pyrroloquinoline Quinone on Stress, Fatigue and Sleep," Funct. Foods Health Dis. 2, 307–324 (2012).

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