ADHD PLUS MINUS TREATMENT PLAN

+ OLIGOMERIC PROANTHOCYANIDINS (OPCs)

Dr. James Greenblatt, MD

The plan below is part of a guide for practitioners to add elements (+) or remove them (-) from the patient's environment or lifestyle as treatment for ADHD symptoms. Biochemical individuality will determine the most important elements for each patient.

OPC MECHANISM

ADHD and Oxidative Damage

Oxidative metabolism has been found to be impaired in ADHD. A 2018 review showed ADHD is associated with lower total antioxidant status (TAS), higher total oxidant stress (TOS) and higher oxidative stress index (OSI) (Verlaet et al., 2018).

One possible mechanism is an impaired use of glutathione (GSH), the main protective antioxidant in the central nervous system as well as another important antioxidant, catalase (Verlaet et al., 2019; Joseph et. al., 2015, Guney et al., 2015). More recently, a 2019 study confirmed these associations by showing lower total antioxidant capacity, and lower glutathione and catalase levels in patients with ADHD (Nasim et al., 2019).

The brain is particularly sensitive to oxidative stress due to its high metabolic rate. An increased level of oxidative stress, along with lowered antioxidant levels can impair such vital functions as neuronal proliferation, neurotransmitter function, and eventually contribute to the deterioration of normal cerebral and EEG functions (Verlaet, Maasakkers et. al., 2018).

Oligomeric Proanthocyanidins (OPCs)

OPCs are dietary polyphenols that support healthy cognitive function by improving antioxidant capacity. This has the further downstream benefit of reducing inflammation. OPCs are created by plants to protect themselves from environmental harm, and are usually found as pigments or colours in food. Examples are pine bark (pycnogenol), blueberry extract, grapeseed extract (GSPE), dark chocolate (at least 60% cocoa), and green tea.

Effect of OPCs

A review by Rodríguez-Pérez et al. (2019) summarizes in vitro and animal research outcomes of GSPE, including increased superoxide dismutase (SOD), catalase (CAT) and glutathione (GHS) activity while also decreasing reactive oxygen species (ROS) and improving total antioxidant status (TAS). Pycnogenol protects against oxidative stress by increasing the synthesis of anti-oxidative enzymes, by scavenging free radicals, and by protecting other antioxidants such as GSH and vitamins C and E (Rohdewald, 2002; Simpson 2019). Rendeiro et al (2012) showed improved speed of learning in rats with a blueberry-enriched diet.

In humans, pycnogenol has been shown to reduce oxidative damage to DNA, normalize TAS, and improve attention, concentration and hyperactivity ratings in children with ADHD (Chovanová et al 2006; Trebatická et. al., 2006). Pycnogenol supplementation in healthy students also showed improved sustained attention, memory, executive functions, and mood ratings (Luzzi et al., 2011). Green tea extract similarly improves working memory and mood scores in healthy volunteers (Schmidt et. al., 2014; Zhang et. al., 2013).

Further studies show benefits of OPCs including normalization of neurotransmitters involved in ADHD pathogenesis (Dvorakova et. al., 2007), and improved beta-theta wave ratios on EEG (Okello et. al., 2016) that describe more focused attention and concentration activity in the brain.

OPCs not only have antioxidant capacities, but also antihistaminic and immunoregulatory effects that help to improve psychiatric conditions. Grapeseed polyphenolic extract (GSPE) potently decreases tau protein tangles in certain neurodegenerative conditions (Pasinetti et al., 2010), and an OPC combination product improves cognitive function in mice with Alzheimer's disease (Wang et. al., 2012). In addition, OPC supplementation protects against blood brain barrier (BBB) permeability in rats, a feature common to many psychiatric conditions (Robert et al., 2001)

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OPC USE

In summary, OPCs help to counteract elevated oxidative stress in patients with ADHD and may also serve to protect against other immunological disease processes in the brain that contribute to psychiatric symptomatology.

INDICATIONS

Consider if patient has inattentive-type ADHD with poor attention, daydreaming, and easy distractibility.

TREAT

Combination products including multiple OPCs including GSPE, green tea and its extracts, blueberry extract, and pynogenol appear to provide the most clinical benefit.

- Curcumasorb Mind or OPC-Sorb by Pure Encapsulations 1 capsule bid, with meals
- 1oz dark chocolate (at least 60%, given with nuts to counterbalance the sugar).

No adverse events have been reported with the use of OPCs and in specific the above combination products. Nonetheless, watch for theoretical allergies or sensitivities like urticaria or exacerbation of symptoms.

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