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A Review on Nootropics

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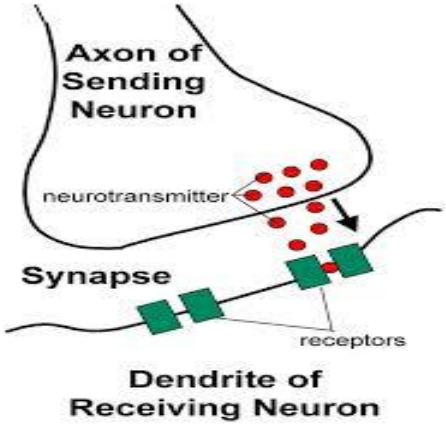
Abstract

Nootropics are class of cognitive enhancing supplement that improve concentration and boost memory. Nootropics are often used to increase attention spans, help individuals focus and as studying aids. Nootropics referred to as “smart drugs “as they are associated with increased intelligence, motivation, and mental energy. Nootropics are broadly any type of neuroenhancing drug with very low prevalence of side effects. medical research of memory deficits and age related memory loss has resulted in new explanations and treatment techniques to improve memory, including diet, exercise, stress management, psycnopharmacology, oxygen therapy ,mental exercise, cognitive therapy, and pharmaceutical medications. Neuroimaging as well as cognitive neuroscience have provided neurobiological evidence supporting holistic ways in which one can improve memory.

Keywords: psycnopharmacology, oxygen therapy, cognitive therapy, cognitive neuroscience, neuroimage.

Introduction

Nootropics - also called smart drug, memory enhancers, neuro enhancers, cognitive enhancers, and intelligence enhancers, motivational, and stress management are drugs, supplements, nutraceuticals, and functional foods that improve one or more aspects of mental function. Nootropics have actually been found as one of the reliable supplements for the mind; for that reason, its relevance has actually additionally led folks in the renovation of their memory as well as finding out ability or intellectual procedures. Specific effects can include improvements to working memory, motivation, or attention. The word nootropic was coined in 1972 by a Romanian psychologist and chemist, Corneliu E. Giurgea, from the Greek words νους nous, or "mind", and trepein meaning to bend or turn.

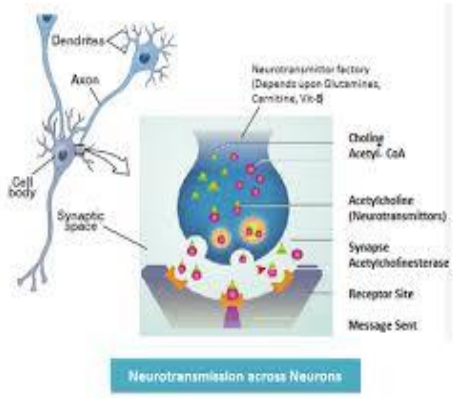


There are only a few drugs that are known to improve some aspect of cognition. Many more are in different stages of development. The most commonly used class of drug is stimulants, such as caffeine.

These drugs are purportedly used primarily to treat cognitive or motor function difficulties attributable to disorders such as Alzheimer's disease, Parkinson's disease, Huntington's disease, and ADHD. Some researchers, however, report more widespread use despite concern for further research. Nevertheless, intense marketing may not correlate with efficacy. While scientific studies support the beneficial effects of some compounds, manufacturer's marketing claims for dietary supplements are usually not formally tested and verified by independent entities.

Academic use

In academia, nootropics have been used to increase productivity, despite their long-term effects lacking conclusive research in healthy individuals. The use of prescription stimulants is especially prevalent among students attending academically competitive colleges. Surveys suggest that 0.7–4.5% of German students have used cognitive enhancers in their lifetime. Stimulants such as dimethylamyl amine and methylphenidate are used on college campuses and by younger groups. Based upon studies of self-reported illicit stimulant use, 5–35% of college students use diverted ADHD stimulants, which are primarily used for performance enhancement rather than as recreational drugs.



Several factors positively and negatively influence the use of drugs to increase cognitive performance. Among them are personal characteristics, drug characteristics, and characteristics of the social context.

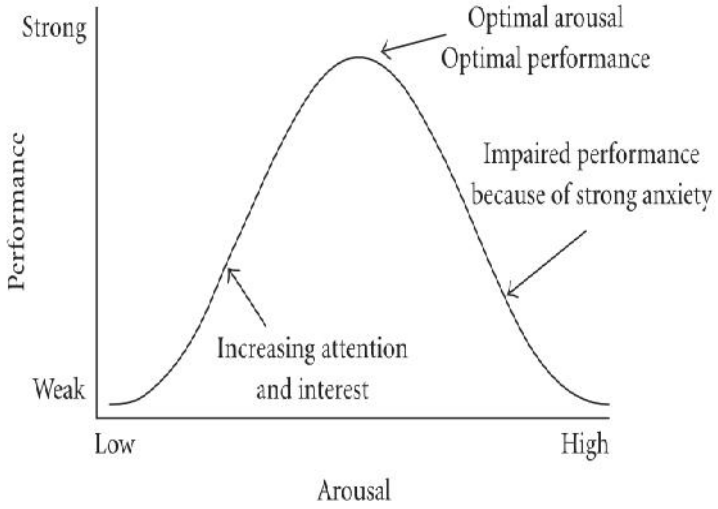
Side effects

The main concern with pharmaceutical drugs is adverse effects, and these concerns apply to cognitive-enhancing drugs as well. Long-term safety data is typically unavailable for some types of nootropics (e.g., many non-pharmaceutical cognitive enhancers, newly developed pharmaceuticals and pharmaceuticals with short-term therapeutic use). Racetams—compounds that are structurally related to piracetam - have few serious adverse effects and low toxicity, but there is little evidence that they enhance cognition in individuals without cognitive impairments. While addiction to stimulants is sometimes identified as a cause for concern, a very large body of research on the therapeutic use of the "more addictive" psychostimulants indicate that addiction is fairly rare in therapeutic doses. On their safety profile, a systematic review from June 2015 asserted, "Evidence indicates that at low, clinically relevant doses, psychostimulants are devoid of the behavioral and neurochemical actions that define this class of drugs and instead act largely as cognitive enhancers."

In the United States, unapproved drugs or dietary supplements do not require efficacy approval before being sold.

Drugs

Stimulants



In 2015, systematic medical reviews and meta-analyses of clinical research in humans established consensus that certain stimulants, only when used at low (therapeutic) concentrations, unambiguously enhance cognition in the general population; in particular, the classes of stimulants that demonstrate cognition-enhancing effects in humans act as direct agonists or indirect agonists of dopamine receptor D_1, adrenoceptor A_2, or both receptors in the prefrontal cortex. Relatively high doses of stimulants cause cognitive deficits.

- Amphetamine pharmaceuticals (Adderall, dextroamphetamine, and lisdexamfetamine [an inactive prodrug]) – systematic reviews and meta-analyses report that amphetamine benefits a range of aspects of cognitive control (e.g., attentional control, inhibitory control, episodic memory, and working memory, among others) in the general population, and these effects are especially notable in individuals with ADHD. A 2015 meta-analysis of high quality evidence found that therapeutic doses of amphetamine and methylphenidate improve performance on working memory, episodic memory, and inhibitory control tests in normal healthy adults.[27] It also improves task saliency(motivation to perform a task) and performance on tedious tasks that require a high degree of effort.
- Methylphenidate – a substituted phenethylamine that improves cognitive control (e.g., working memory, episodic memory, and inhibitory control) in the general population. It also improves performance on tedious tasks that require a high degree of effort. At above optimal doses, methylphenidate has off target effects that can decrease learning by activating neurons not involved in the task at hand.
- Eugeroics (armodafinil and modafinil) – wakefulness promoting agents; modafinil increases alertness, particularly in sleep deprived individuals, and was noted to facilitate reasoning and problem solving in a systematic review. They are clinically prescribed for narcolepsy, shift work sleep disorder, and daytime sleepiness remaining after sleep apnea treatments.
- Xanthines (most notably, caffeine) – shown to increase alertness, performance, and, in some studies, memory. Children and adults who consume low doses of caffeine showed increased alertness, yet a higher dose was needed to improve performance. A 2014 systematic review and meta-analysis found that concurrent caffeine and L-theanine use has synergistic psychoactive effects that promote alertness, attention, and task switching; these effects are most pronounced during the first hour post-dose.

- Nicotine – A meta-analysis of 41 double-blind, placebo-controlled studies concluded that nicotine or smoking had significant positive effects on aspects of fine motor abilities, alerting and orienting attention, and episodic and working memory.

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Miscellaneous

- Phosphatidylserine (a phospholipid) with DHA and EPA (omega-3 fatty acids) – two Cochrane Collaboration reviews on the use of supplemental omega-3 fatty acids alone (without phosphatidylserine) for ADHD and learning disorders conclude that there is limited evidence of treatment benefits for either disorder.
- Tianeptine – enhances several metrics of cognition in animal models. It has also been shown to prevent stress-induced dendritic remodeling in various brain structures, and antagonizes alcohol's neurodegenerative effects.
- L-theanine – see the Xanthines entry above.
- Valproate – a study has suggested that valproate may be able to enhance the cognitive ability of absolute pitch.
- Bacopamonnieri – A nutraceutical herb with "neural tonic" and memory enhancing properties shown in humans in a double-blinded RCTs.
- Panax ginseng – Multiple RCTs in healthy volunteers have indicated increases in accuracy of memory, speed in performing attention tasks and improvement in performing difficult mental arithmetic tasks, as well as reduction in fatigue and improvement in mood.
- Salvia officinalis – Although some evidence is suggestive of cognition benefits, the study quality is so poor that no conclusions can be drawn from it.
- Ginkgo biloba – Different reviews come to different conclusions. A 2009 Cochrane review found not enough evidence to make conclusions in those with dementia. Another review stated "there is consistent evidence that chronic administration improves selective attention, some executive processes and long-term memory for verbal and non-verbal material."
- Isoflavones – A double-blind, placebo-controlled study showed improvement in spatial working memory after administration of isoflavones. One RCT showed soy isoflavone supplementation improved performance on 6 of 11 cognitive tests, including visual-spatial memory and construction, verbal fluency and speeded dexterity, but worse on two tests of executive function.

Racetams

The racetams are structurally similar compounds of pramiracetam, oxiracetam, coluracetam, and aniracetam, which are often marketed as cognitive enhancers and soldover-the-counter. Racetams are often referred to as nootropics, but this property of the drug class is not well established. The racetams have poorly understood mechanisms of action; however, piracetam and aniracetam are known to act as positive allosteric modulators of AMPA receptors and appear to modulate cholinergic systems.

Conclusion

Nootropics are generated to enhance our psychological capabilities; however human brain supplements are additionally medically made to improve our social abilities. The significance of Nootropics has actually led to a method to battle anxiousness as well as day-to-day tension of a human's life and also development. **Nootropics** shows signs of neuro-preservation and neuro-protection. These compounds directly affect the level of neuro transmitters associated with slowing down the aging process. Nootropics have been used to increase the productivity, despite their long-term effects lacking conclusive research in individuals. Several factors positively and negatively influence the use of drugs to increase cognitive performance specific effects can include improvement to working memory. Some nootropics will result in an increase in production of brains cells while slowing down their destruction as well.

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