

DOI: 10.21767/2472-0151.100030

Effectiveness of Brahmi in Various Illnesses: Review Paper

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Received date: September 06, 2017; Accepted date: September 21, 2017; Published date: September 28, 2017

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Citation: Mukherjee A, Gombar V, Shamsi Y, Gupta M, Sinha S. Effectiveness of Brahmi in Various Illnesses: Review Paper. Herb Med. 2017, Vol.3 No.2:10.

Abstract

Plants have been used as treatments for thousands of years, based on experience and folk remedies and continue to draw wide attention for their role in the treatment of mild and chronic diseases. In these eras, focus on plant research has increased all over the world and a large body of evidence has been accumulated to highlight the immense potential of medicinal plants used in various traditional systems of medicine. In various medicinal plants *Centella asiatica* is one of the most useful plants seen in Ayurveda medicines. *Centella asiatica* (commonly known as Brahmi in India) is an imperative medicinal drug which possesses significant medicinal properties, especially those involving cognition. It has been extensively known as a brain tonic that promotes cerebrum development. This herb is recommended for the treatment of various skin conditions such as leprosy, lupus, varicose ulcers, eczema, psoriasis, diarrhea, fever, amenorrhea, diseases of the female genitourinary tract and also for relieving anxiety and improving cognition. The present paper reviews Brahmi (*Centella asiatica*) as a medicinal plant and highlights its benefits in various health problems.

Keywords: *Centella asiatica*; Brahmi; Medicinal; Unani

Introduction

Based on their role in treatment of mid and chronic health problems, plants have been used for a thousand years now. As of late, herbal plants are in limelight due to their capability to show promising results in various health problems. The Unani system of medicine has a long history and an impressive record. Its origins date back to the eleventh century, laid by the Arabs and Persians. Today, India is one of the main nations in so far as the act of Unani medication is concerned. It has the biggest number of Unani instructive, research and medicinal services foundations. According to Unani literature, diagnosis

of any disease includes clinical features i.e., signs, symptoms, laboratory features and mizaj (temperament). However, Unani school of medicine has similarities with Ayurveda based on the theory of presence of elements in human body. It is the imbalance in these elements that are present in different fluids leads to illness. 'Medhya Drugs' are a group of medicines which have been asserted to enhance mental capacity, particularly dealing with those neurological and psychiatric disorders that are connected with loss of memory and various cognitive deficits. Some of these which have claimed to act on the nervous system are Shankapushpi, Vacha, *Centella asiatica*, Ashwagandha, *Bacopa monnieri*.

Professionals and drug stores acknowledge the utilization of both, *Bacopa monnieri* or *Centella asiatica* as Brahmi despite the fact that a portion of the writings have made efforts to rule out the discussion in regards to personality of correct types of Brahmi. Both the plants are believed to be equipotent with respect to their medicinal value while making diverse formulations. *Bacopa monnieri* is a well-known memory enhancer and *Centella asiatica* restores memory, longevity and has cognition enhancing effects [1]. In the following paper, we will review *Centella asiatica* as a medicinal plant and its benefits as it has been in use for almost 3000 years in Unani, Ayurvedic and Chinese medicines.

Description of the Plant

Centella asiatica, a psychoactive medicinal plant, is found in abundance in wet soil, is a slender, tender, faintly aromatic herb which is widely cultivated in warmer parts of Asia, Australia, America and India. The herb is known as Mandookaparni in Ayurveda, Brahmi in Unani Medicine and Gotu Kola in the Western World. It looks like a creeping perennial with numerous branches and small, oblong, relatively thick leaves which are arranged opposite to each other on the stem. Flowers are small and light purple or white with four to five petals. It can grow naturally in wetland, shallow water, damp and muddy shores. It have ability to grow in water and makes it is popular aquarium plant as shown in **Figure 1**.



Figure 1 Brahmi medicinal plant.

In India, the plant is sold in the market as 'Brahmi'. The term 'Brahmi' finds its origins in 'Bramha' the legendary creator of Hindu Pantheon and brain is the focal point of creative actions in human body as shown in **Figure 2**.

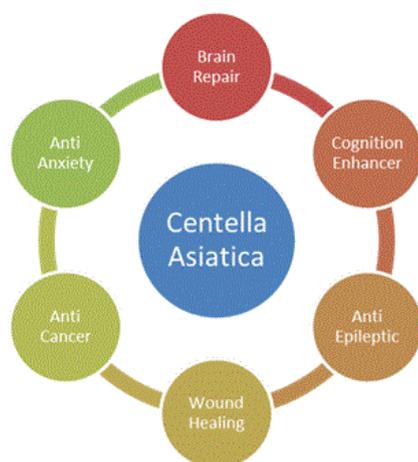


Figure 2 Uses of Brahmi in different illness.

Aiding in Brain Repair

Brahmi is synonymous with Brain Repair, having a particular activity on cerebrum which is ordinarily utilized among all medical experts. *Centella asiatica* is one of the prominent herbs for revitalizing the nerves and brain cells [1].

Brain Damage is of two types – Traumatic and Acquired. Causes of traumatic brain injury are car accidents, sports injury, blows to the head, physical violence etc. Causes of Acquired brain injury are Poisoning or exposure to toxic substances, Infection, Strangulation, Stroke, Tumors, and Neurological illness. Brain damage during pregnancy and delivery can be caused by a variety of ways, including oxygen deprivation, infant jaundice, physical trauma suffered during labor and delivery, and infections in the mother's body. The resulting damage to the baby's brain differs widely in severity and can lead to various disabilities and psychological issues. For decades scientists believed that a damaged brain cannot be repaired. However, cutting edge research shows that brain cells can regenerate, leading to brain repair. With its significant nootropic properties, Centella extract has been useful in accelerating the repairing of damaged neurons [2], improving intelligence and enhancing cognitive values [3], decrease in

mitochondrial damage [4]. 'Nootropics' are those 'smart drugs' which primarily enhance brain's natural function by methods as-increasing brain's oxygen supply, increasing glucose utilization and stimulating nerve growth [5]. Studies report that *Centella asiatica* possesses significant antioxidant activity [6] and proven beneficial in reducing the effect of lead poisoning as lead has no biological function in human beings but affects the development of Central Nervous System [7]. Nevertheless, *Centella asiatica* is an imperative herb for boosting mental activity [8].

As a Memory Enhancer

Medicinally, the entire plant has been used in different formulations to treat various disorders, particularly those involving poor memory, intellect and anxiety since the prehistoric times. Bacosides, which are the dynamic elements of Brahmi are responsible for improving efficiency of transmission of signals along nerve fibers which in turn, fortifies memory and cognition [9]. Accounting to the multi-factorial nature of these illnesses, present day prescription based psychoactive medications have met with constrained achievement. In this manner, there is a developing interest for novel items that could focus on numerous pathways and enhance the mental capacities either freely or in blend with regular medications. *Centella asiatica* is appeared to be exceptionally valuable in enhancing learning and memory. It is likewise utilized as a brain tonic for promoting brain growth and specifically, cerebrum development. Research confirms that Centella Asiatica has neuroprotective properties and nootropic movement with helpful ramifications for patients with memory misfortune. Findings indicate that *Centella asiatica* has the ability to repair damaged neurons [10] and stimulate the neuronal dendritic growth in neurodegeneration [11].

Medicinal Benefits

In one of the studies, findings indicated that administration of *Centella asiatica* every day for two months reduced stress, attenuated anxiety, negated depression and enhanced adjustment and attention in patients. Therefore, *Centella asiatica* has potential action in the regulation of hypothalamopituitary-adrenocortical axis (HPA axis) especially, during stress related disorders, strengthening the opinion that *Centella asiatica* may be a safer alternative to Benzodiazepines for the therapy of stress related clinical disorders [12]. Another study concluded that regular use of Brahmi could be helpful as a supplement in treatment of neurological disorders caused by free radical damage. Free radicals or highly reactive oxygen species are formed by exogenous chemicals or endogenous metabolic processes in the human body. These are capable of oxidizing bio-molecules viz nucleic acids, proteins, lipids and DNA and can initiate different degenerative diseases like neurological disorders, cancer, emphysema, cirrhosis, atherosclerosis, arthritis etc. Brahmi is rich in antioxidants which are compounds that terminate the attack of free radicals and thus reduce the risk of these disorders [13]. Brahmi dosage along with standard therapies is likely to

improve cognition and social skills in Autistic Children [14]. *Centella asiatica* aids in antiepileptic activity by reducing motor activity [15], restores level of growth stimulating hormone [16], enhances neuronal dendrite in stress and memory disorder [17]. It has been used as a memory enhancing, strength promoting, immune booster, anti-anxiety, anti-epilepsy and anti-stress substance since ancient times [18,19]. Clinically, *Centella asiatica* has been effective in treatment of mentally retarded children and anxiety neurosis [20]. This plant is also found to improve short-term memory and learning [21] and possesses a protective effect against oxidative damage caused by lead acetate induced neurotoxicity [22]. As concluded by various experimental studies, *Centella asiatica* has anti-ulcer, wound healing, neuro-protective and cardio-protective properties [23]. Its extract shows protective effects against cognitive deficits and oxidative stress which further results in improving memory retention [24].

Molecular Pharmacology of Brahmi

Brahmi basically contains triterpene acids [25], volatile and fatty acid that contains glycerides of palmitic, stearic, lingoceric oleic, linonic and linonic acids [26], alkaloids [27], Glycosides [28] and flavonoids which is isolated from the leaves of the brahmi plants. The plant also contains amino acids, magnesium, sodium and potassium which have healing properties.

Pharmacological Studies of Brahmi

In field of Ayurveda medicine brahmi is most useful medicinal plant and several research studies in this fields suggested different biological activities. Some biological activities are as following.

Gastric ulcer healing

In case of gastric ulcer it prevents development of cold induced gastric ulcer which is formulated due to stress. It helps in enhancement of GABA level in the brain and generates protective action against the stress induced ulcer due to its adaptogenic property. It also strengthens the mucosal barrier and reduces the damaging effects of free radicals [29].

Wound healing

It helps in would healing by producing triterpenoid fraction extracted from *Centella asiatica* which helps to increase the percentage of collagen in cell layer fibronectin and promotes wound healing [30]. Asiatic Acid is the extract of brahmi leaves increases the peptidic hydroxyproline and helps in remodeling of collagen synthesis in wounds.

Memory enhancing

Brahmni plants have significant results on learning and memory enhancer. It helps to decrease the level of norepinephrine and dopamine in the brain that results

increased cognitive ability [31]. Aquatic extract of brahmi decreased the pentylenetrazole kindled seizure and show improvement in the learning.

Conclusion

Centella asiatica has justified its use as a panacea drug to treat a wide variety of health problems since time immemorial. Innumerable experimental and clinical investigations have demonstrated its significant role in enhancing memory and uplifting cognition, promoting brain repair, antiepileptic, anti-anxiety, wound healing, anti-stress activities. Clinical trials have proven its effectiveness in supporting treatment for autism and mental retardation. It is most commonly used as a nervine tonic that enhances learning and academic performance, improves mental alertness, sharpens short-term and long-term memory, rectifies speech disorders, increase concentration and intellectual ability in children [32].

Future Prospects

Literature till date is beneficial for multiple useful clinical effects of *Centella asiatica*, specifically in the area of cognitive deficit. However, more double blind randomized clinical trials are required for understanding the drug's mechanism for ameliorating CNS related conditions and investigate its immunomodulatory, antidepressive, brain repair and antioxidant properties that have been demonstrated experimentally in animals.

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