In this competitive era, every human being wants to achieve highest goal. Furthermore, in routine life and in the social interactions too good cognition is always appreciated. Cognition is the physiological process of knowing, including awareness, perception, reasoning, and judgment. Cognitive functions are mainly categorized into memory, attention, creativity and intelligence. It is an elemental condition necessary for competent dealings in different spheres of life and can be inferred from an individual’s performance on a content related task.

A cognitive task is defined as any task in which appropriate processing of mental information is critical to successful performance. While a cognitive process is the process in which mental contents are operated upon to produce some response. The cognitive processes can however take many forms. Some of these processes are involved in understanding the requirement of a task, the types of stimuli to be presented, what kind of responses are to be made, and (sometimes) the time allotted for performance and how the responses are to be scored and evaluated.

Cognitive dysfunction is a major health problem in 21st century. Stressful lifestyle in this competitive world may be the root cause. Age, stress and emotions are the conditions that may lead to memory loss, amnesia, anxiety, high blood pressure, dementia, and to more ominous threat like schizophrenia and Alzheimer’s disease (Vasudevan and Parle, 2006). Cognitive impairment is the major health problem in normal aged life as well as in some disease conditions. So there is a need of enhancement the cognition.

Cognitive enhancement may be defined as the amplification or extension of core capacities of the mind through improvement or augmentation of internal or external information processing systems. The enhancement aspects of cognition, such as learning and memory, now seem possible for people with normal age related decline and in healthy people, although so far the effects of these cognition enhancers are modest. Cognition enhancers are medications and natural supplements that are used to improve the function of various human cognitive abilities such as cognition, memory, intelligence, motivation, attention and concentration when they have become impaired in some manner. Many different strategies are proposed to enhance cognition.
Some of these strategies are pharmaceutical drugs, advanced techniques and medical devices, environmental enrichment and exercise, foods and nutrients, physical acts, and herbal medicines.

Nootropics are popularly referred to as “smart drugs”, “smart nutrients”, “cognitive enhancers”, “brain cognitive abilities” (the functions and capacities of the brain). The term covers a broad range of substances including drugs, nutrients and herbs that have purported cognitive enhancing effects. However, the resulting adverse effects associated with these agents have limited their use (Blazer, Federspiel, Ray, Schaffner, 1983; Rogers, Farlow, Doody, Mohs, Friedhoff, 1998). But the drugs obtained from the plant i.e. herbal drugs have been claimed to have no such type of side effects (Karandikar, Pandit and Kulkarni, 1997).

The Indian traditional system of medicine offers a number of safe treatments. Medicinal plants have been used to treat such psychotropic and behavioral conditions as anxiety, depression, seizures, poor memory, dementia, insomnia and drug intoxication (Jonathan, 2006). The World Health Organization (WHO) estimates that 80% of the world’s population presently uses herbal medicine for some aspects of primary health care (Howes and Houghton, 2003). Recently, the interest in the use of herbal products has grown dramatically in the western world as well as in the developing countries (Kashmira and Patel, 2010). Ayurveda claims that several plants, the "Medhya" plants (intellect promoting) herbs such as, Convolvulus microphyllus (C. pluricaulis), Centella asiatica, Bacopa monnieri, Acorus calamus, Zingiber officinale and Celastrus paniculatus are beneficial in cognitive disorders (Joshi and Parle, 2006). Ayurvedic drugs like Brahmi, Ashwagandha, Jatamansi and Shankhpushpi are the most popular herbal drugs that are used as cognitive enhancer.

Shankhpushpi is one of the traditional ethnomedicines used in Ayurvedic medicine in India as a controversial source of Shankhpushpi for various brain related disorders. Convolvulus pluricaulis has been widely used in Ayurvedic medicine to treat nervous disorders, similar to the use of kava kava (piper methysticum) and valerian (valeriana officinalis) is prescribed by American herbalists (Husain, 2007). For this study a single drug Shankhpushpi was selected.

Acharya Charaka said that Shankhpushpi is best among the medhya rasayanas (Charaka Samahita, 1949). According to traditional system of medicine, Shankhpushpi is considered as a
promotor of life span, strength and intellect. It cures mental disorders like Insomnia, hysteria, Insanity, high blood pressure, and depression (Brahmvarchas, 1999).

The Ayurvedic system of medicine advocates its use as a brain tonic. Dietary feeding of this plant increased protein synthesis of the hippocampus, thus enhancing memory and learning in experimental animals (Sinha, Dixit, Madnawat, Sharma, 1989). It showed reduction in the level of plasma cortisol and urinary catecholamines (Shukla, 1981). The Shankhpushpi gives effective relief in symptoms of behaviour disorders (Nesari, and Kapse, 2005). Herbalists believe that Shankhpushpi calms the nerves by regulating the body’s production of the stress hormones, adrenaline and cortical (Kumar, 2006). It is found that there is no side effect of Shankhpushpi even used for longer durations (Priyanka and Batra, 2004, Dubey, Pathak and Gupta, 1994). Very little human research has been published in the western/eastern medical literature regarding this plant.

Keeping in mind the lack of experimentation related to cognition enhancement by Shankhpushpi, it was thought to investigate the effect of Shankhpushpi. The problem of the study is entitled as, “To Study the Effect of Shankhpushpi (whole plant) on Cognitive Abilities. In view of such a problem, the present study is centered on the following objectives.

1. To verify the effect of Shankhpushpi on cognitive tasks.
2. To verify the effect of durations of Shankhpushpi (whole plant) on cognitive abilities.

Keeping the pertinent literature in view the investigator proposed following hypotheses:

1. Shankhpushpi would enhance performance on Abstract Reasoning
2. Shankhpushpi would enhance performance on Digit Symbol test.
3. Shankhpushpi would enhance performance on Vocabulary test.
4. Shankhpushpi would enhance the performance on Arithmetic Scale.
5. Shankhpushpi would enhance the performance on Intellectual Processing Scale.
6. Longer the duration of administration of Shankhpushpi more the enhancement in cognitive abilities.
In order to verify the hypotheses, the following design was employed:

A pre-post, placebo controlled parallel group design was undertaken on students to investigate the effect of herbal treatment i.e. Shankhapushpi on cognitive tasks. It was a blind study. A sample of total 30 students of different teaching departments of M.D. University was selected on the bases of availability. The age range of these students was between 23-25 years. The sample included only female students from both rural and urban background, belonging to various types of SES. The subjects were given either 3.5 gm of Shankhapushpi or 3.5 gm of an ordinary powder with honey followed by a glass of milk for different durations i.e. 20 days and 40 days.

The subjects were tested on following tasks-

1. Abstract Reasoning
2. Digit Symbol test
3. Vocabulary test
4. Arithmetic Scale
5. Intellectual Processing Scale

The t- test was employed for the comparison between control and experimental groups. Results indicate that there was a consistent increase in the d score for 20 days, 40 days, as well as grand means in the control and experimental group. However, the t when applied to test the difference between pre and post taken after 40 days, the value is highly significant in case of abstract reasoning. So the first hypothesis predicting that the Shankhapushpi would enhance performance on Abstract Reasoning is proved.

Secondly it was hypothesized that Shankhapushpi would enhance performance on Digit Symbol. Results indicates that the t value for comparison of control and experimental group after both durations i.e. 20 days and 40 days which was highly significant. Thus second hypothesis is proved.

Third hypothesis of the study was that Shankhapushpi would enhance performance on Vocabulary. In this case results indicate that there was a consistent increase in both the control and the experimental group after 20 as well as 40 days. But in case of 40 days there is no
significant difference. Third hypothesis has proved in case of 20 days that the Shankhapushpi would enhance performance on vocabulary test. But in case of 40 days treatment hypothesis has not been confirmed.

Fourth hypothesis of the study was that Shankhapushpi would enhance performance on Arithmetic Scale. In this case it was found such a difference between control and experimental group for both durations i.e. after 20 days and 40 days. But it is important to note that there was not significant difference between the control group and experimental group for both of the treatments (after 20 days and 40 days). Thus the fourth hypothesis has not been confirmed in both durations i.e. 20 days and 40 days treatment that the Shankhapushpi would enhance the performance of arithmetic scale.

In case of Intellectual Processing Scale, it was hypothesized that Shankhapushpi would enhance the performance on Intellectual Processing Scale. Results indicate such a difference between the control and experimental group for 20 days and 40 days. But it shows no significant difference in control and experimental group for 20 days and 40 days treatment. Thus the fifth hypothesis has not proved in both durations i.e. for 20 days and 40 days treatment that the Shankhapushpi would enhance the performance of Intellectual Processing Scale.

Lastly it was hypothesized that longer the duration of administration of Shankhapushpi more the enhancement in cognitive abilities. For this purpose also data was analyzed with t-test. It was found that Shankhapushpi treatment has a durational effect in abstract reasoning, digit symbol, vocabulary, and arithmetic scale. But it is important to note that Shankhapushpi treatment has not durational effect in case of intellectual processing scale. Thus, last hypothesis that ‘longer the duration of administration of Shankhapushpi more the enhancement in cognitive abilities’ proved in case of abstract reasoning, digit symbol, vocabulary, and abstract reasoning, but this hypothesis has not proved in case of intellectual processing scale.

After concluding, it can be said that Shankhapushpi enhanced the digit symbol task and abstract reasoning. But on arithmetic task and intellectual processing task there was no impact of Shankhapushpi even after an administration of 40 days. It seems that larger duration administration is required for this purpose.
One of the unique contribution of the present study is that the positive effect of Shankhapushpi observed in this study could be of great use to general population as well as for those suffering from cognitive decline.