Brahmi is an important drug known for its memory enhancing property. In Ayurveda this drug is described as a Rasayana drug. The Rasayana therapy (rejuvenating therapy) aims specially at the promotion of strength and vitality. The other benefits of Rasayana therapy include promotion of memory and intelligence, immunity against diseases and decay, preservation of youthfulness, luster, complexion and voice. The plant is an important member of the Rasayana group which includes drugs like amalaki, ashwagandha, shilajit. However, during the review of literature we came across the fact that the Rasayana effect of Brahmi is not clinically established. This formed the basis for the present study. Therefore the study to collect data by clinical trials to establish Rasayana effect of Brahmi was undertaken. The standardized extract of Bacopa monniera containing 55±5 % of bacoside with an optimum concentration of bacogenines (SpeciallyA3) BESEB in capsule forms, 300 mg one capsule per day was used in the study.

After exhaustive review of literature total 95 healthy volunteers were selected from the nearby region of IFTM Moradabad. Among them 79 successfully completed the study. The clearance from institutional ethics committee was taken from the department. All the healthy human volunteers of either sex, aged between 20 to 75 years were assessed for eligibility of inclusion/exclusion criteria. Subjects who were suffering from cancer, AIDS, kidney related disorders, liver dysfunction or undergoing treatment for any other serious chronic illness, or underwent major hospitalization or any surgery during past 3 years were not included in the study.

The capsules of Bacopa and placebo were identical in shape, size and color. Fixed numbers of capsules were given to the volunteers in a dark colored coded container.

The instruction about the study was given to the selected volunteers. The drugs were distributed to the volunteers as per schedule, in addition to the trial regime (one bottle for 4 weeks), additional capsules ranging in number from 1-10 (randomly allocated) were also placed in the bottles so that compliance could be accurately examined. After the completion of 4 weeks, participants were asked to bring their bottles and the remaining capsules were counted. Participants were excluded if greater
than 10% of the total number of capsules required were not consumed by the end of the 4 weeks. At each study visit including the initial visit all volunteers were assessed for same parameters. A clinical assessment of each eligible volunteer was carried out at a base line (0 month) and scheduled monthly clinical visits up to 12 months.

The volunteers were divided into three parts to study the effect of BESEB.

Part one of the work deals with cross over study. Cross over study forms an important part of the clinical trial. This study is important as it helps in deciding whether the observed effect is due to the drug or formulation or the change is observed due to some physiological factor. In this study a patient being treated with drug under test is shifted to placebo in due course of time. Similarly another set of patients receiving placebo treatment is put on drug trial. This study was carried out on 54 patients for a period of one year divided over two phases of six months each. Part two of the study deals with comparison between *Brahmi*, placebo and a standard marketed formulation. This study was performed for a period of 6 months. In the third part of the study 15 volunteers were given only *Brahmi* treatment for one year.

The biochemical parameters like heart function test, liver function test, kidney function test, the hematological parameter like hemoglobin TLC, DLC, and physical parameter like hand grip, blood pressure, chest circumference, height and weight, total of 46 parameters were assessed during the study.

The *Brahmi* has a positive effect on the HDL level. HDL level increased in both cross over and of one year trial which was also the case in comparative study. The triglyceride, serum cholesterol, LDL and VLDL levels were reduced significantly in one year study. This was same as observed in cross over except for VLDL level which was slightly increased. The comparative study did not show any change in these parameter. Thus it can be concluded that *Brahmi* improves cardiac functions.

An elevation in alkaline phosphatase level was observed in crossover study while no effect was observed in comparative study. Decreased level in one year study was observed. Thus it can be inferred that long term use may be safe.
No effect on serum albumin, serum bilirubin, conjugated bilirubin and unconjugated bilirubin levels was noted in crossover and comparative study but a significant increase in levels was observed in one year study.

No change in SGOT level was observed in crossover study as well as one year study. A significantly higher level was observed in comparative study. SGPT level was higher in crossover study, non significant in comparative study and in one year studies, indicating that long term use of Brahmi can be considered safe on hepatic functions. As liver is one of the vital organs of the body this fact is encouraging for the long term use of Brahmi.

Total protein level was lower in comparative study and higher in one year study, no change in crossover study was observed. No effect on the level of creatinine was recorded in cross over and comparative study. There was a slight increase in one year study. Thus prolonged use of Brahmi may have potential side effects on kidney. Serum urea level was significant in crossover study and in one year study but was not significant in comparative study.

Hyperuricemia may lead to gout. Gout results from overload of uric acid in body. Uric acid crystals are also responsible for kidney filtering troubles. In present study the level of uric acid was reduced in crossover, but long term use indicated increase in its level.

The level of glucose in human is a major factor responsible for complication indicated in form of diabetes. In the year 2000 at least 17 million people worldwide suffered from diabetes which was about 2.8% of world population. Diabetes has emerged as a major health care problem in India. The number of diabetic in India is estimated to rise to about 70 million by 2025. It was noted that Brahmi was effective in reducing blood sugar level. The results were significant in both cross over and one year study, but was non significant in comparative study.

The higher concentration of hemoglobin ensures better oxygen supply which results in improved biochemical functions. Hemoglobin is also responsible for maintenance of pH and maintenance of ionic balance. In all the studies Brahmi has
shown improvement in it. Thus *Brahmi* has a positive beneficial effect on hemoglobin concentration.

The results of one year study suggest that though there is a decrease in monocytes and neutrophils. The eosinophils level showed increase and there was no significant change in lymphocytes. There was an increase in total leucocytes. This phenomenon of increase in TLC suggests increase in immunity on long term use, while no effect was observed in short term use.

A decrease in weight was observed in crossover and comparative study; it was also decreased significantly in one year study. An increased in hand grip level was observed in one year study, which is significant in another, both the studies. Means power to grab an article is increased by the *Brahmi* treatment.

The level of blood pressure decreased in all the studies, which was significant in one year study. It is a good indicator of cardiac function. Decrease in pulse rate was noted in all the studies which were significant in comparative and one year study. An improvement in stress was observed in all the studies at significant level, indicating that *Brahmi* has ability to reduce stress.

Improvements in anxiety level, reduction in hypertension and in dizziness level were observed in all the three studies. All these parameter when in balance indicates improvement in health.

Further improvement in sleep abnormality, in walking effect and decrease in muscle and low back ache shows that *Brahmi* has a potent good effect on health. Improvement in pulmonary function, oxygen carrying capacity and in forgetfulness was observed in all three studies further supporting the Rasayana claim of *Brahmi*.

Feeling of general well-being by self and by the researcher, improvement in appetite and reduction in constipation also support the positive effect.

The *Rasayana* therapy aims at the promotion of strength and vitality, which includes preservation of youthfulness, luster, complexion and voice. Therefore some physical parameter included viz hand grip, oxygen carrying capacity, pulmonary
function (forced expiration volume), weight, muscle ache, constipation low back pain, forgetfulness, sleep abnormality, stress, appetite, general well being hypertension, anxiety, walking effect and dizziness. In addition biochemical and hematological parameters like serum cholesterol, HDL, LDL, VLDL, triglyceride, hemoglobin, glucose, TLC, DLC were also improved. All these parameters when in balance indicate healthy human being. The present study showed that there was a significant improvement in these parameters.

The major objective of this study was to clinically establish Rasayana effect of 
Brahmi. The data generated on the basis of various biochemicals, hematological and physical parameters during the study could successfully establish the same. It may be concluded that 
Brahmi could be very useful during short term as well as long term use.

**Future Prospects**

An interesting future direction on Bacopa research is particularly, looking at antioxidant markers in the blood after acute or chronic administration compared to a baseline or placebo group. Furthermore testing for levels of the bacosides in the blood stream could be an interesting direction. Some researchers have speculated that these bacosides are responsible for the memory facilitating effect—so looking at levels of these bacosides in the blood over a chronic period would be interesting.

Research could be further done at a clinical population, such as sufferers of dementia or Alzheimer’s disease as Bacopa has been shown to have antioxidant effects and using it in conjunction with current dementia or Alzheimer’s treatments could potentially lead to reduction in associated symptoms such as neuronal loss. The suggestions that Bacopa actually seems to reduce the levels of amyloid-βeta-peptides in the brain of significant importance to the future study of this impressive compound.