



Research Article

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EFFECT OF CHYAWANPRASH ON COGNITIVE, AUTONOMIC AND RESPIRATORY PARAMETERS IN COLLEGE STUDENTS

Kumar Sai Sailesh¹, Archana R², Soumya Mishra³, Symphoria⁴, Mukkadan JK^{5*}

¹Little Flower Medical Research Centre (LFMRC), Angamaly, Kerala, India

²Associate Professor, Department of Physiology, Saveetha Medical College, Thandalam, Chennai, Tamil Nadu, India

³Senior resident, Department of Physiology, JIPMER, Pondichery, India

⁴Vice Principal, St James College of Nursing, Chalakudi, Kerala, India

⁵Research Director and PhD Guide, Little Flower Medical Research Centre, Angamaly, Kerala, India

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*Corresponding author

Dr. Mukkadan JK, Research Director and PhD Guide, Little Flower Medical Research Centre, Angamaly, Kerala, India

E-mail: drmukkadan@gmail.com

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ABSTRACT

Chyawanprash is an Ayurvedic formulation used in India since ages for its medicinal and nutritional value. In Ayurveda, chyawanprash is classified under the category of Rasayana, which is useful for general wellbeing, vitality and help in delaying ageing process. Though, there are few studies available on the usefulness of chyawanprash in the cognitive functions however, studies on management of dementia in human beings are still inadequate. In the light of this, the present study was undertaken to explore the memory boosting potential of chyawanprash. 128 healthy college students (75 females and 53 males) were recruited from the students of various courses conducted in Little Flower Institute of Medical Sciences and Research. Chyawanprash was given orally in a dose of one teaspoon full (approx. 15 g) twice a day for 150 successive days to the subjects in the test group. On the basis of the study it may be concluded that chyawanprash is helpful in improving of cognition i.e. alertness, attention and concentration; well being and the academic performance for college students. Therefore, regular use of chyawanprash has a potential to build up academic performance of students.

Keywords: Chyawanprash, Cognition, College students.

INTRODUCTION

Learning is an enduring change in behavior that results from sensory information. Memory is the acquisition, storage and retrieval of sensory information.¹ From physiological point of view, memory is divided into explicit and implicit forms.² Working or short-term memory, also known as primary memory, registers and retains incoming information for a short time (matter of seconds) after its input.³ Long term memory is a function of neo-cortex. Alzheimer's disease is most common neuro-degenerative disorder affecting memory areas.³ There are various herbs and Ayurvedic formulations which are well documented to have memory boosting actions. Chyawanprash is an Ayurvedic formulation used in India since ages for its medicinal and nutritional value. In Ayurveda, chyawanprash is classified under the category of Rasayana, which is useful for general wellbeing, vitality and help in delaying ageing process⁴⁻⁵. It is being used long before the clinical importance of vitamins, minerals and antioxidants was known. Chyawanprash is a complex mixture of multiple Ayurvedic ingredients. The health benefits of the ingredients have been well documented scientifically. The combination of these ingredients used in Chyawanprash will provide better health benefits. In addition to the other health benefits, it is helpful in promoting digestion and helps relieve cough and other common respiratory tract infections⁶⁻⁹.

Aim and objective

Though, there are few studies available on the usefulness of chyawanprash in the cognitive functions however,

studies on management of dementia in human beings are still inadequate. In the light of this, the present study was undertaken to explore the memory boosting potential of chyawanprash.

MATERIALS AND METHODS

Chyawanprash (Chy)

Zandu Sona Chandi Chyawanprash Plus was used in the present study, which was manufactured by Hemma herbs Pvt Ltd, India, licensed user of Emami Ltd, Kolkata, India.

Study design and participants

The study was approved by Institutional Ethics Committee of Little Flower Hospital and Research Centre, Angamaly and St James Nursing College, Chalakudy, India. A written, informed consent was obtained from all the participants. The study was carried out in accordance with the "Ethical Guidelines for Biomedical Research on Human Participants, 2006" by the Indian Council of Medical Research and the Declaration of Helsinki, 2008. The clinical study was conducted at Little Flower Medical Research Centre, Angamaly and St. James College of Nursing, Chalakudy, Kerala, India. 128 healthy college students (75 females and 53 males) were recruited from the students of various courses conducted in Little Flower Institute of Medical Sciences and Research. The subjects were recruited via advertisement on notice-boards. The advertisements includes the information that the relationship between the Chyawanprash and health benefits. A detailed medical history was obtained from all participants by a semi-

structured interview and by filling out a general socio-demographic and medical questionnaire and they underwent a standard physiological examination, which enabled us to exclude individuals involved in drug/alcohol abuse, and those taking any kind of prolonged medication or suffering from chronic debilitating disorders. The willing participants were randomized into Control (n = 53) (35 females and 18 males) and test group (n = 75) (40 females and 35 males) by simple randomization method using random numbers generated through computer. Chyawanprash was given orally in a dose of one teaspoon full (approx. 15 g) twice a day for 150 successive days to the subjects in the test group.

Inclusion and Exclusion Criteria

Inclusion criteria

Students with normal average height and weight and without any major diseases were included in the study.

Exclusion criteria

Students with any serious diseases, not willing to give consent, drug/alcohol abuse, suffering from Chronic debilitating disorders and taking prolonged medication were excluded from the study.

Cognitive Parameters

Short term memory

Short term memory performance reflects alertness, attention and concentration of the subjects. In this study to observe the cognitive functions, free-recall task of words, numbers and pictures in six sessions were performed¹⁰⁻¹¹. These test parameters were earlier been studied in one of the study conducted to see the difference in short term memory in healthy males and females¹². On day 0 before the administration of chyawanprash, this task was performed in both control and test groups. From day 1, one teaspoon full of chyawanprash twice a day was given orally to test group for 150 days. On 151st day, the task was performed. The results were compared to observe memory boosting effect of chyawanprash. At the beginning plain paper was given to all the subjects in which they were asked to write their age, sex and any history of cognitive disorder or head injury. To test the

short-term memory of the subjects, six sessions were planned. First three sessions were prepared with ten words, numbers and pictures. In the first session a list of ten words were displayed. Ten words were carefully selected to ensure that they were unrelated. In second session, ten random numbers were displayed; and in third session, ten pictures were displayed which are unrelated. The subjects were asked to recall the displayed words, numbers and pictures. Numbers of the correct items recalled were measured. In each session, ten words, numbers and pictures were displayed to all the subjects for one minute and one minute break was given where words or numbers or pictures are not displayed and discussions was done with the subjects about the sports and politics to prevent them to recall the words. After this one minute break, in each session all the subjects were provided with one minute time to write the words, numbers and name of the pictures displayed on a paper. Similarly, the last three sessions were prepared with twenty words, numbers and pictures in each session and similar technique was followed. At the end of each session, papers were collected from the participants.

Academic Performance

Performance of students in theory examinations was compared between test and control groups at the end of the study.

Autonomic and Respiratory Parameters

Blood pressure, pulse rate were measured and compared between test and control groups. Po₂ was recorded by Pulse oximetry¹³. Data was analyzed by SPSS 20.0, using Independent sample t test.

RESULTS

The results of effect of chyawanprash on cognitive, autonomic and respiratory parameters in college students are presented in table 1 to table 6. Table 1 is showing demographic information and Table 2 to 5 showing changes in cognition, autonomic, respiratory parameters before and after administration of chyawanprash. Table 6 is showing comparison of academic performance between control and test groups

Table 1: Mean age of the subjects in control and test groups

Group	Number of participants	Age
Control	53	19.56 ± 1.59
Test	75	19.68 ± 1.53
Total	128	19.63 ± 1.55

Table 2: Mean values of free recall of words, numbers and pictures in six rounds before administration of chyawanprash in both the groups

Round number (Short term memory test)	Control	Test	p value
Round 1 (10 words)	8.62 ± 1.03	7.84 ± 1.25	< 0.001*
Round 2 (10 numbers)	7.52 ± 1.69	6.99 ± 1.59	0.073
Round 3 (10 pictures)	8.54 ± 0.64	9.01 ± 0.60	< 0.001*
Round 4 (20 words)	14.83 ± 1.88	14.71 ± 1.75	0.713
Round 5 (20 numbers)	15.25 ± 2.76	15.01 ± 2.07	0.584
Round 6 (20 pictures)	17.04 ± 2.19	17.07 ± 1.90	0.938

*P value < 0.001 is statistically significant

Table 3: Mean values of Blood Pressure, Pulse rate and Po₂ in control and test groups before administration of chyawanprash in both the groups

Parameter	Control	Test	p value
Po ₂	96.64 ± 2.71	95.55 ± 2.79	0.030
Pulse rate	93.42 ± 7.17	87.59 ± 13.28	0.005
Systolic Blood Pressure	132.29 ± 19.09	125.57 ± 18.64	0.050
Diastolic Blood Pressure	79.37 ± 11.26	77.32 ± 11.99	0.335

P value < 0.001 is statistically significant

Table 4: Mean values of free recall of words, numbers and pictures in six rounds after administration of chyawanprash

Round number (short term memory test)	Control	Test	p value
Round 1 (10 words)	8.32 ± 1.28	9.35 ± 0.90	< 0.001*
Round 2 (10 numbers)	6.74 ± 1.67	7.80 ± 1.84	0.001
Round 3 (10 pictures)	8.08 ± 2.25	9.36 ± 0.99	< 0.001*
Round 4 (20 words)	15.13 ± 2.65	17.58 ± 2.03	< 0.001*
Round 5 (20 numbers)	14.49 ± 2.85	15.69 ± 2.83	0.020
Round 6 (20 pictures)	15.74 ± 2.55	18.93 ± 1.33	< 0.001*

*P value < 0.001 is statistically significant

Table 5: Mean values of BP, Pulse rate and Po₂ in control and test groups after chyawanprash administration

Variable	Control	Test	p value
Po ₂	95.62 ± 4.12	97.07 ± 2.47	0.015
Pulse rate	86.94 ± 8.04	85.07 ± 8.51	0.213
Systolic Blood Pressure	127.60 ± 13.26	118.76 ± 10.74	< 0.001*
Diastolic Blood Pressure	76.98 ± 7.43	73.70 ± 8.71	0.028

*P value < 0.001 is statistically significant

Table 6: Mean values of academic performance (percentage of marks in theory examinations) in control and test groups

Variable	Control	Test	p value
Academic performance	46.45 ± 14.69	61.64 ± 11.72	< 0.001

P value < 0.001: statistically significant

DISCUSSION

According to the Charaka Samhita, Chyawanprash is "the foremost of all rasayanas"¹⁴. Various plants and their isolated phytochemicals have been used for treatment of various disorders related to learning and memory¹⁵. Chyawanprash is a traditional Ayurvedic formulation, useful for general wellbeing, vitality, vigor and for rejuvenation. In an earlier study, administration of chyawanprash for 15 consecutive days significantly improved the memory of aged mice when compared to young mice. Chyawanprash increases cholinergic transmission by inhibiting acetylcholineesterase. It also decreases free radical generation and increased scavenging of free radicals.¹⁶ In the present study, chyawanprash was administered to 75 college students and their cognition i.e. alertness, attention and concentration and respiratory parameters were recorded before and after administration. It has been observed that their cognition improved significantly when compared with control group in recall task of words, number and picture. The vitals such as blood pressure, pulse, oxygenation were also recorded which were within normal range. Their academic performance in percentage of marks in theory examination was significantly improved when compared with control group. Zandu Sona Chandi Chyawanprash Plus is enriched with natural nootropic agents (NNA) like Brahmi (*Bacopa monnieri*), Shankhapushpi (*Convolvulus pluricaulis*), Ashwagandha (*Withania somnifera*), Jyotishmati (*Celastrus*

paniculatus), Almond (*Prunus amygdatus*), Guduchi (*Tinospora cordifolia*) etc along with other potential Ayurvedic ingredients. It is being prepared from multiple Ayurvedic ingredients majority of which help in fortifying the natural immunity, thus protecting from common day to day infection such as cough and cold. Besides immunity, presence of NNA helps in improving memory, concentration and in keeping the mind alert.

CONCLUSION

Basis the study it may be concluded that chyawanprash is helpful in improving cognition i.e. alertness, attention and concentration; well being and the academic performance for college students. Therefore, regular use of chyawanprash has a potential to build up academic performance of students.

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