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EFFECT OF CHOLESTEROL FREE EGG YOLK LECITHIN AND ITS FORMULATION WITH MENTAT DS ON LOCOMOTOR ACTIVITY IN ALBINO MICE

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Abstract

The Cholesterol free egg yolk lecithin was isolated using solvent precipitation method. Lecithin from various resources has a reputation for a chorine, an essential precursor of major Brain Neurotransmitter and other normal body functions. In the present study the attempt was made to study the use of variable percentage of said lecithin; along with 3 Formulations viz FLS-I,II & III combined with MENTAT DS, a brand, Himalaya, Bangalore; using Locomotor activity as a basic tool, of brain activity in healthy Wistar rats. The work was carried out in Pretox Research centre, Sachin, Surat, Gujarat with CPCSEA, New Delhi; FDCA, Gujarat, an approved, contract research organization. The results of were highly significant with Ordinary one way ANOVA, F value 42.01 and P value < 0.0001, for the formulation containing FLS-III. Thus the results conveyed a message that the use of lecithin in combination of other memory enhancer drug(s) / formulation(s) may possibly be a useful tool in combating various other brain function ailments, including aging related.

INTRODUCTION

The International Life Sciences Institute of North America further specifies that functional foods have physiologically active components that give them their functional properties[1]. Egg yolks stores lecithin egg oil and whole eggs, also protein. For this reason, the USDA (United States Department of Agriculture) categorizes eggs within the Food Guide Pyramid[2,3] It also contains all of the Choline, and one yolk contains approximately half of the recommended daily intake. Choline is an important nutrient for development of the brain, and is said to be important for pregnant and nursing women to ensure healthy fetal brain development.[4] Lecithin/Drug Interactions were studied like; the effect of lecithin with cholinesterase inhibitors remains equivocal. The combination of physostigmine and lecithin enhanced cognitive functions in Alzheimer's patients[5,6]. However, several studies did not find an effect of physostigmine, whether or not administered with lecithin[7,8,9]. In a few clinical studies, lecithin had an added beneficial effect in Alzheimer's patients when used with tacrine[10,11]; however, the majority of studies have found no effect with tacrine and lecithin[12,13,14] Lecithin/Herb/Supplement Interactions: were studied for Choline a component of lecithin. Human and animal studies show that lecithin increased plasma free choline levels [15,16,17], Lecithin co-administered with piracetam had a beneficial effect in patients with Alzheimer's disease in one study[18] . A complex of lecithin and phosphatidylserine resulted in significant changes in pituitary adrenal activity[19]. In human study, sitostanol reduced cholesterol absorption but only if formulated with lecithin . The solubility of sitostanol in artificial bile was greatly increased by including lecithin[20].Insufficient Lecithin/Food Interactions evidence available. Lecithin had no effect on EEG activity[21].Based on several clinical studies, lecithin may improve the lipid profile by reducing LDL cholesterol and the LDL cholesterol:HDL cholesterol ratio and increasing HDL cholesterol[22].

MATERIAL AND METHODS

Drugs and chemicals

Mentat DS (Nootropics & Neurotonics/Neurotrophics, Himalaya, Bangalore), Cholesterol free egg yolk lecithin isolated previously.

Experimental animals:

Albino mice of either sex, weighing between 18-22 g were used in this study. All the animals were procured to Pretox Research Centre, Sachin, Surat, Gujarat approved for experimental purpose. After procuring the animals were acclimatized for 7 days and housed in groups of six under standard husbandry conditions like room temperature 26± 20C relative humidity 45-55% and light/ dark cycle of 12 hrs. All the animals were fed with standard diet and water. After obtaining permission from institutional animal ethical committee (IAEC) of PRC, animal studies were performed as per the rule s and regulations in accordance to guidelines of CPCSEA. Animas were fasted to overnight prior to vehicle / standard/ Isolates/formulations administration and during the experiment. All experiments were carried out during light period.

Determination of LD50

All standards and test were dissolved in distilled water. The doses were selected according to the OECD guidelines 423 [23,24]. The procedure was divided into two phases. Phase I (observation made on day one) and Phase II (observed the animals for next 14 days of drug administration). Two sets of healthy female mice (each set of 3 mice's) were used for this experiment. First set of animals were divided into nine groups, each of six animals in a group. Animals were fasted overnight with water ad libitum. Animals received a single dose of 2000 mg/kg was selected for the test, as the test item was a source from herb. After administration of extract, food was withheld for 1-2 h. All animals were observed for clinical signs during the first 30 min and then at approximately 4 h after administration of extracts on day 0 and once daily during 1 to 14 days. [25]

Locomotor activity [26]

Albino mice (18-22 g) of either sex were divided into 9 groups. Animals are fasted overnight prior to the test but water was supplied ad Libitum. Group I was served as vehicle treated control; Group II was standard group – MENTAT DS Group III-VI

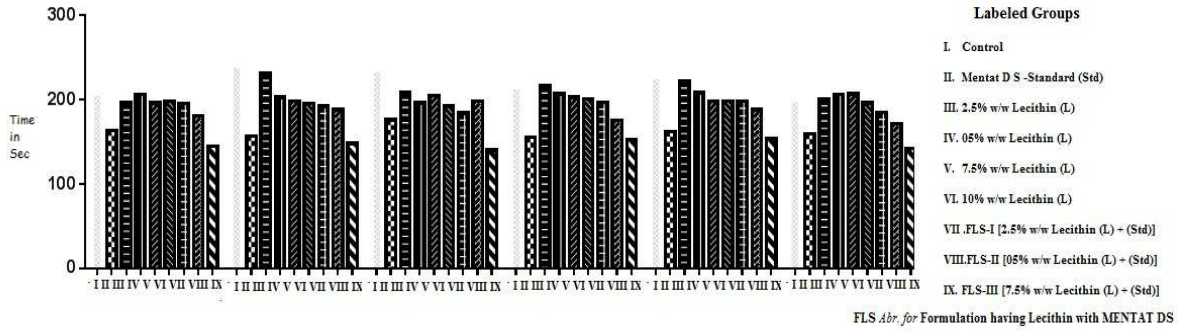
were test group received 2.5, 5,7.5,10 percent respectively of Cholesterol free egg yolk lecithin group VII-IX were the test group(FLS-I, FLS-II, FLS-III) received 2.5, 5,7.5 percent respectively of Cholesterol free egg yolk lecithin along with the standard dose of MENTAT DS, respectively. One hour after above treatment, each mouse was placed individually in Photoactometer INCO, Ambala, India) for a period of 10 mins and locomotor activity was measured.

RESULTS

Determination of acute toxicity LD50

All animals in respective group at a dose of 2000 mg/kg , exhibited normal behavior , without any signs of passivity, stereotypy and vocalization. Their motor activity and the secretory signs were also normal and sign of depression or mortality.

Locomotor activity



Effect of Cholesterol Free Egg Yolk Lecithin and Its Formulation with MENTAT DS on Locomotor Activity in Albino mice

Table 1

Experimental Data Table

Groups	I	II	III	IV	V	Vi	VII	VIII	IX
	Control	Standard (S)	2.5% L	5% $^{+}$L	7.5% $^{+}$L	10% $^{+}$L	2.5% $^{+}$L + (S)	5% $^{+}$L +(S)	7.5 % $^{+}$L + (S)
	206.	163.	196.	206.	196.	198.	195.	181.	145.
	240.	157.	231.	203.	198.	195.	192.	188.	148.
Time	234.	176.	208.	196.	205.	192.	184.	198.	140.
In	215.	155.	216.	207.	203.	201.	197.	175.	153.
sec	226.	162.	222.	208.	198.	198.	198.	188.	154.
	198.	159.	201.	206.	207.	196.	185.	171.	142.

+ L = Cholesterol free egg yolk lecithin % = % w/w

Table 2

Statistical Data for Experimental Data Table

Groups	I	II	III	IV	V	VI	VII	VIII	IX
	Control	Standard (S)	2.5% L	5% $^{+}$L	7.5% $^{+}$L	10% $^{+}$L	2.5% $^{+}$L + (S)	5% $^{+}$L +(S)	7.5 % $^{+}$L + (S)
Time in	206	163	196	206	196	198	195	188	145
sec	240	157	231	203	198	195	192	188	148
	234	176	208	196	205	192	184	198	140
	215	155	216	207	203	201	197	189	153
	226	162	222	208	198	198	198	188	154
	198	159	201	206	207	196	185	183	142
Total Value	1319	972	1274	1226	1207	1180	1151	1134	882
Mean	219.83	162.00	212.33	204.33	201.17	196.67	191.83	189.00	147.00
SD	16.35	7.48	13.19	4.41	4.45	3.08	6.05	4.90	5.73

Table 3

Ordinary one way ANOVA

ANOVA summary	Activity data
F	42.01
P value	< 0.0001
P value summary	****
Are differences among means statistically significant? (P < 0.05)	Yes
R square	0.8819

DISCUSSION

The results shown by group III-VI reveal that the cholesterol free lecithin has much of therapeutic effect hence not significant results. Group VII-VIII shows mild positive results but not significant in comparison to Standard- Mentat DS, Group-II. The results with Group IX shows most highly significant than the Standard- Mentat DS, Group-II.

CONCLUSION

Group IX containing 7.5 %w/w of Cholesterol free egg yolk lecithin and MENTAT DS, shows most highly significant than the standard results. Hence standard formulation, MENTAT DS will have a better therapeutic window when formulated along with Cholesterol free egg yolk lecithin.

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