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SHORT COMMUNICATION

Effects of Aqueous Extract of Tulsi and Cardamom on Elderly Depressive Subjects - A Preliminary Clinical Study

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Abstract

An aqueous extract of *Ocimum sanctum* (Tulsi) and *Elettaria cardamomum* (Cardamom) was administered to elderly subjects suffering from depression living in selected old age home. Geriatric Depression Assessment Scale was used to assess the level of depression; based on the scale, 40 subjects were selected for the study. The subjects were divided into two groups of twenty each. Experimental group received aqueous extracts of *Ocimum sanctum* and *cardamom* for eight weeks, similarly, control group received aqueous extract of *green tea leaves*. Post assessment was done after eight weeks of treatment in both the control and experimental groups. Aqueous extracts of *Ocimum sanctum* and *cardamom* were found to have a significant anti depressive effect on experimental group after 8 weeks, while control group did not show any significant change. Preliminary data of the study showed a significant antidepressive activity of *Ocimum sanctum* and *cardamom* extracts.

Keywords: Antidepression, *Elettaria cardamomum, Ocimum sanctum*

1. Introduction

Depression is a mental condition in which the feeling of despondency and dejection. It is a most common and serious medical condition, which negatively affects feeling, thinking and behaviors. It is not a sign of weakness, but it can lead to physical and emotional problem[1]. Depressive persons have decreased ability to work at home or job place. The most prominent symptoms of depression are usually sadness or depressed mood, loss of interest or pleasure in activities once he/she enjoyed[2]. Older people are susceptible to depression and decline in mental ability, which makes them dependent[3].

There are so many allopathic drugs available in market such as Tricyclic Antidepressants (TCAs), Monoamine Oxidase Inhibitors (MAOIs), Selective Serotonin Reuptake Inhibitors (SSRIs)[4]. As many of the above drugs show severe side effects such as insomnia, loss of appetite, weight gain, suicidal tendency, etc.[5] research work regarding the treatment of depression with alternative system of medicine on human subjects are lacking. However, many studies have been undertaken on animals.

A study was conducted on experimentally induced anxiety and depression in animals, in which it was shown that *ethanolic leaf* extract of *Ocimum sanctum* Linn. (OS) (Lamiaceae), was effective against these disorders[6]. In Swiss albino mice, gross behaviour was observed through Digi scan animal activity monitor. Depression was measured through tail Suspension Test (TST) and Forced Swim Test (FST). Anxiety tests included light-dark test, elevated plus maze test, and whole board test. OS at 50 mg/kg shortened

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the immobility time in the TST and FST, respectively, indicating a possible antidepressant activity. Additionally, a diminution in the anxiety response at a dose of 50 mg/kg, p.o. body weight was also observed against light-dark test, elevated plus maze test, and hole board tests, which signifies its anxiolytic activity. No defects were observed in the motor coordination of the mice in the rotarod test. Thus, the OS extract shows anxiolytic and antidepressant properties at the same dosage.[6]

More studies have shown that cardamom oil from *Elettaria cardamomum* (Zingiberaceae) produced anti depressant effect through certain experimental model for finding out anti-depressive activity[7,8].

Ocimum sanctum is also called as Tulsi and Holy Basil. It has provided significant contribution to the field of science from ancient times as well as to modern research due to its huge number of medicinal properties such as analgesic, anticancer, antiasthmatic, antiemetic, diaphoretic, antifertility and antistress agents[9]. It is also found to have anti-depressive and anti-anxiety activities in the above-mentioned animal studies. Reports from Ayurvedic literature depicts that cardamom has been shown to fight against depression. Also, it has a wonderful taste and relaxing scent, that helps calm the senses[10]. On other hand, the antidepressant activities of *cardamom* and *Ocimum sanctum* have not been studied yet in human. Therefore, the present study was aimed to explore the combined effect of *Ocimum sanctum* and *Cardamom* for their antidepressant activity in elderly persons suffering from depression.

2. Material and Method (Clinical study)

2.1 Sample Selection

An experimental study was conducted among 40 subjects with depression (Standardized Geriatric Depression Assessment Scale – Developed by J. A. Yesavage in 1982[11]) for eight weeks from 21 October, 2020 through 21 December, 2020. Subjects with depression were recruited from various old age homes (Jalaram old age home and Swarg community old age home) located at Vadodara, India.

Participants with depression, aged ≥ 60years, and not taking any antidepressant medication were included in the study. Participants were excluded from the study if there was any need to start antidepressant therapy during intervention, pre-existing serious diseases and history of hypersensitivity. All participants signed informed written consent and the ethics committee of Sumandeep Vidyapeeth deemed to be University approved the study.

2.2 Preparation of Plant Extract

Ocimum sanctum was collected from Sumandeep Vidyapeeth campus, washed and completely dried for 3 days. *Cardamom* was purchased from local grocery shop. 10 g Ocimum sanctum powder and 5g *Cardamom* was grinded into powder by using mixture grinder. The aqueous extract was prepared in 200 ml of boiled water and was filtered using Whatman filter paper no1. Each ml of extract contains 50 mg *Ocimum sanctum* and 25 mg *Cardamoms*. These extracts were prepared on daily basis. Every day 10 mL extracts were given to the participants (5 mL morning and 5 mL evening). Total amount of *Ocimum sanctum* and *Cardamon* given per day was 500 mg and 250 mg respectively. To avoid any bias, control group was given *green tea* extracts having the same colour of the plant extract.

2.3 Study Design

Total 52 participants were screened by using Standardized Geriatric Depression Assessment Scale. Out of them, 12 participants were excluded as per the exclusion criteria. Remaining 40 participant were randomly divided into two groups: Group-I (Experimental group) and Group-II (Control or Placebo group), both having 20 participants in each group. The Group-I participants received *Ocimum sanctum* and *Cardamom* extract whereas, the Group-II received *green tea* extract. The extracts were administered for eight weeks. The participants were interviewed once a week to assess their compliance.

3. Statistical Analysis

Statistical analysis was performed using the Statistical Package for the Social Science (SPSS version 20.0). The Kolmogorov – Smirnov Test was used to check the normality of the data. The pre-test of experimental and control group data was found to be normally distributed. Thus, parametric independent t-test was used to compared the pre-test result of both experimental and control group. On other hand, post-test of experimental group data was found to be not distributed normally, So the Mann Whitney U Test was used to find a significant difference between experimental group and control group in post-test scores of depressions. The level of $p<0.05$ was considered as significant. To calculate each group, the power analysis was done, and the number of each group set up as 20 and result of the power analysis was found very reliable (95%).

4. Result

There was no adverse reaction caused using herbal extracts during study period. All participant present throughout the study and there were no dropouts. Assessment was done in both the groups of patients. After the treatment based on the assessment scale, the participants were divided into two groups. If the score is 10-19 and 20-30, participants are diagnosed with mild and severe depression respectively[11]. After the treatment, 11(55%) participants showed no symptoms of depression, and rest of participants showed mild depression 9(45%). Whereas, in control group participants have shown mild and severe depression of 14 (70%), 6 (30%) respectively.

After 8 weeks of intervention statistical test were conducted. Combination effect of *Ocimum sanctum* and *Cardamom* reduced the depression level in experimental group test and results were compared with control group test. It was statistically proven by Mann Whitney U test result. So, there is a significant difference between experimental group and control group int test scores of depressions among old age people residing in old age (Tables 1 and 2; Figures 1 and 2).

Table 1. Shows the mean rank of experimental and control group (n = 40)

	Group	N	Mean Rank
Post test Score	Experimental group	20	11.98
	Control group	20	29.03
	Total	40	

Table 2. Shows the level of significance between experimental and control group.

	Post test Score
Mann-Whitney U	29.500
Wilcoxon W	239.500
Z	-4.634
Asymp. Sig. (2-tailed)	.000

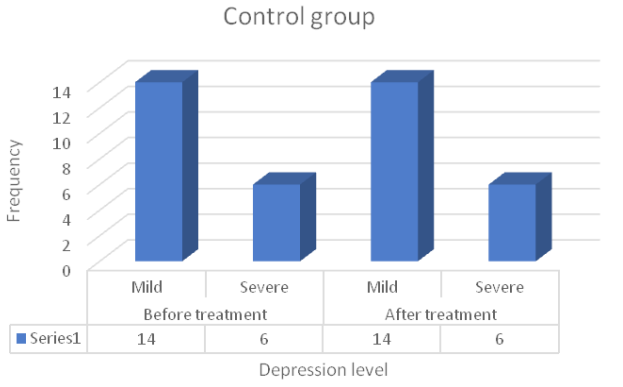

Figure 1. Frequency of depression in control group before and after treatment with green tea leaves (placebo group).

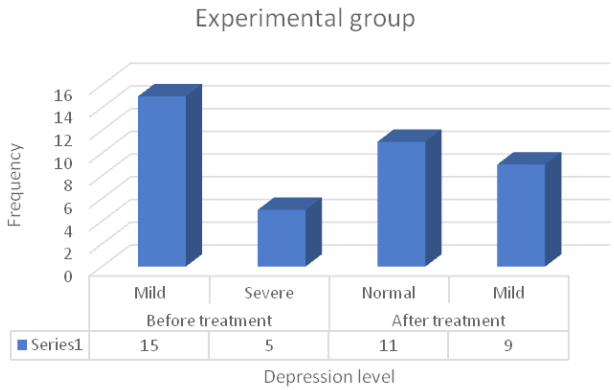

Figure 2. Frequency of depression in experimental group before and after treatment with *Ocimum sanctum* and *cardamom* extracts.

5. Discussion

From the literature it was shown that some of the active principles present in *Ocimum sanctum* are Linalool and Beta-caryophyllene. Beta-caryophyllene has been found to have affinity for CB2 (endocannabinoid) receptor. CB2 receptors is supposed to help in treating anxiety and depressive subjects.[12] In the present study, it has been found that aged depressive patient treated with aqueous extracts of *Ocimum sanctum* showed a significant improvement in their depressive status. Besides *Ocimum sanctum* also contain Linalool which is also having antianxiety and anti-depressive effect[6-13]. In the present study administration of *Ocimum sanctum* for 8 weeks caused a significant reduction in the depression level of mild and severely affected patients. These anti- depressive effect of *Ocimum sanctum* might be due to the actions of the two terpinenes (Linalool and Beta-caryophyllene) present is the plant.

It has also been found that *Cardamom* contains α-pinene, β-pinene and linalool[14]. In one of the studies conducted in mice by using the forced swimming test (FST) it was found that *Cardamom* showed anti-depressive activity. Further study was carried out to assess the possible contribution of serotoninergic system for the anti-depressive activity of *Cardamom*. It was found in animal study that cardamom induced anti-depressive activity was reduced by the pre-treatment with WAY 100635 (a 5-HT1A receptor antagonist) and PCPA (a serotonin synthesis inhibitor)[15]. It seems that WAY 100635 blocked the antidepressant effect of linalool and β-pinene. Therefore, *Cardamom* induced anti-depressive activity might be due to its interaction with the 5-HT1A receptors.

6. Conclusion

From this study it is concluded that anti-depressive effect of *Ocimum sanctum* and *Cardamom* aqueous extract might be due to their presence of some of chemical constituents like linalool-pinene, β-pinene[12–14]. Many of the allopathic anti-depressive drugs available now have many adverse effects5. Therefore, more studies on human beings should be carried out to substantial anti-depressive effect of *Ocimum sanctum* and *Cardamom* plants. If they are found to be more effective in many patients, they can substitute the presently available drugs which have many side-effects.

7. Conflict of Interest

There is no conflict of interest among authors.

8. References

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