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Full Length Research Paper

Immunocompetence potential of *Tinospora cordifolia* on selected postmenopausal women

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Postmenopausal age is such a special stage in the life of women. It has been further estimated that postmenopausal women in India would constitute about 14.1% of the total population by 2025. Several irritable symptoms attributed to menopause are often encountered during these later years of life and freedom from related symptoms and comfort could add life to years. Increasing the immunocompetence in the selected low immunocompetent postmenopausal women is the urgent need to prevent secondary infection and the main aim of the present study was to evaluate the effect of *Tinospora cordifolia* on low immunocompetent postmenopausal women. A group of 200 postmenopausal women was selected and divided into two groups A and B of 100 each. 100 women served as the experimental group and the remaining 100 served as the control group. The experimental group A consisted of postmenopausal women with low immunocompetence and was treated with 525 mg/day of water extract of *T. cordifolia*. The control group was placed on placebo treatment. The impact was studied in terms of weight changes and biochemical parameters representing the symptoms in question over a period of six months. Findings as related to low immunocompetence revealed that *T. cordifolia* proved to be excellent booster of immunocompetence.

Key words: Water extract of *Tinospora cordifolia*, postmenopausal women, immunoglobulin A, G, M, complementary C3, C4, nutritional counseling.

INTRODUCTION

In the long struggle to achieve mastery over the powerful forces of nature, men have always turned to plants for help for food, shelter, clothing, weapon and healing even for relief from hardship of life. Plants provide all these and something more an astonishing display of vital energy in their growth and seasonal rebirth. No wonder that so many myths attribute to plant an intimate personal relationship with our daily lives and with our destinies (Varun, 1998). Ours is a vast country where a wide variation in climate, soil, altitude and latitude is available. Nature has bestowed on us a very rich botanical wealth and a large number of diverse types of plants, which grow wild in different parts of the country. Increased awareness about the potential of this group of interesting and useful plants has encouraged many innovative and progressive growers and entrepreneur to take up their cultivation as a commercial enterprise. In India, the use of different parts of several medicinal plants to cure specific ailments has been in vogue from ancient times. The indigenous systems of medicine namely Ayurveda, Siddha and Unani have been in existence for several centuries. These systems of medicines cater to the needs of nearly 70% of our population residing in the villages. Apart from India, these systems of medicines are used in Korea, China, Singapore, West Asia and many other countries. Besides the demands made by these systems on herbs as their raw material, the demand for medicinal plants for many antibiotics made by the modern pharmaceutical industries had also increased manifold. Thus medicinal plants constitute a group of industrially important crops, which bring appreciable income to the country by means of export. This enterprise also provides means of livelihood to scores of people. Although synthetic drugs and antibiotics brought about a revolution in controlling different diseases, these synthetic drugs are out of the reach of millions of people. In recent years interests in medicinal plants has increased considerably. Apart from the reliance on therapeutic values described,

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Table 1. Changes in immunoglobulin G levels before and after treatment.

Groups	Immunoglobulin G (mg/dl)				't' value
	Initial	After three months	Final (after six months)	Differences	
E (experimental group)	450.26±8.6	960.45±5.96	962.89±4.83	512.63±5.9	Between initial and final values E-10.52**, C-1.63^{NS}
C (control group)	462.89±9.5	469.25±9.8	470.68±8.7	7.79±4.6	Between groups E Vs C-11.40**

^{NS}- not significant **; significant at 1% level.

in ancient texts and current interpretations by specialist in the field of Siddha, laboratories in several countries have initiated analytical studies to scientifically determine the efficacy of better known medicinal plants in the treatment of disease and in maintenance of health and well being during special conditions and stages in human life. Postmenopausal age is such a special stage in the life of women.

In 1990, there was an estimated 467 million aged women of 50 years and above in the world. This number is expected to increase to 1200 million by the year 2020. Although the life expectancy is remarkably similar throughout the world (World Health Organization, 1996). There are 208 million postmenopausal women in the world and about half of them live in the developing countries (United Nations, 1992). It has been further estimated that postmenopausal women in India would constitute about 14.1% of the total population of India by 2025 (Thakle, 1998). Menopause is of increasing importance to the health professionals in terms of both preventive and clinical care of women in their later years. The age at which natural menopause in life expectancy therefore the average women now lives approximately one third of her life in postmenopausal period (Sudan, 1993). A striking age-related hormonal change occurs normally in women during menopause. It has a powerful impact on the disease risks and the nutritional status of the older women. As the ovaries shrink in menopause, there is loss of estrogen production, which brings psychological and physiological symptoms.

The physiological symptoms include dryness of the vagina, osteoporosis, arthritis, diabetes mellitus, hyperlipidemia, susceptibility to infection and obesity, all of which have significant influence hot flushes, sweating at night, anxiety, irritability, lack of concentration, swings of mood and sometimes depression. As the prevalence of physiological symptoms especially low immunocompetence is significant and common in postmenopausal women it was thought of interest to conduct a study to evaluate the impact of supplementation of *Tinospora cordifolia* on postmenopausal women. Though some isolated efforts to characterize the medicinal properties of plants are underway, efforts in a scientific manner to unravel the principle components on the plants which have the unique characteristics to cure low immunocompetence still calls for complete exploration. The present study is a small step in this direction. It aims at identifying the medicinal qualities of *T. cordifolia* to have specific effect on certain conditions like low immunocompetence which is of significance in postmenopausal women. The specific objectives therefore constitute to evaluate the effect of water extract of *T. cordifolia* on selected low immunocompetent postmenopausal women.

MATERIALS AND METHODS

A group of menopausal women living in the same locality belonging to the age group of 45 to 50 years were subjected to screening for low immunocompetence symptoms through biochemical analysis. Out of the 200 postmenopausal women selected 100 subjects formed the experimental group and the remaining 100 subjects formed the control group. Experimental groups were given the respective herbal treatment, while the control group was not given any treatment but were placed on placebo tablet. The toxicity of water extract of *T. cordifolia* had been performed on albino mice and found to be non- toxic up to 5000 mg (Turner, 1969). Water extract of *T. cordifolia* weighing 525 mg/day was given to the experimental group in form of capsules. The control groups were not given any herbal treatment but given the placebo capsules and advised to follow dietary restrictions as for the experimental group. All the subjects were instructed to visit the hospitals once in fifteen days to receive the capsules over the treatment period of six months. The various biochemical parameters assessed were immunoglobin A and M (Zenker et al., 1986), immunoglobin G, complementary C_3 and C_4 (Alphen, 1975).

RESULTS AND DISCUSSION

Changes in immunoglobulin G (IgG) levels

Table 1 gives the mean immunoglobulin G levels in low immunocompetent subjects before and after treatment. The mean initial IgG levels of the experimental and control groups were 450.26 and 462.89 mg/dl respectively. The experimental group recorded an increase of IgG levels from 450.26 to 960.45 mg/dl after three months. After six months IgG level rose to 962.89 mg/dl. This steady increase in IgG levels of the

Table 2. Changes in immunoglobulin a level before and after treatment.

Groups	Immunoglobulin A (mg/dl)				't' value
	Initial	After three months	Final (after six months)	Differences	
E (experimental group)	78.89±8.6	155.61±4.71	155.89±5.83	77±5.97	Between initial and final values E-13.44**, C-2.98^{NS}.
C (control group)	76.24±3.76	77.65±2.36	76.89±2.97	0.65±4.68	Between groups E Vs C-4.29**.

^{NS}- not significant **; significant at 1% level.

Table 3. Changes in immunoglobulin M levels before and after treatment.

Groups	Immunoglobulin A (mg/dl)				't' value
	Initial	After three months	Final (after six months)	Differences	
E (experimental group)	38.26±8.34	78.35±6.3	74.31±5.9	36.05±3.6	Between initial and final values E-10.92**; C-4.61^{NS}
C (control group)	38.29±6.73	38.61±3.25	38.59±4.75	0.30±2.5	Between groups E Vs C-13.94**

^{NS}- not significant **; significant at 1% level.

experimental group placed women in this group in the normal status of postmenopausal women. The mean initial and final value of the control group was below the normal range of values (500 to 650 mg/dl)[8] all through the six months period. The increase in the experimental group was significant at 1% level, but the increase in IgG levels of the control group was not significant. According to the study by Jana et al. (1999) significant effects of IgG was observed after a short term supplementation of *T. cordifolia*. The present finding also shows a similar trend.

Changes in immunoglobulin A (Ig) levels

Table 2 gives the mean immunoglobulin A levels in low immunocompetent subjects before and after treatment. The initial Ig A values of two groups was not within the normal range of 80 to 390 mg/dl. It was encouraging to find that there was a continuous mean increase in Ig A in the supplementary group was 77 mg/dl and in the control group it was only 0.65 mg/dl, respectively. Comparison of the mean increment between the experimental and the control group also proved to be significant at 1% level while the initial and final values of the supplementation of *T. cordifolia* have improved the Ig levels further to normal levels (80 to 390 mg/dl).

Changes in immunoglobulin M (Ig M) levels

Table 3 gives the immunoglobulin M levels in low immuno competent group of post menopausal women before and after treatment. The mean initial Ig M levels of post menopausal women in the two groups were found to be 38.26 and 38.29 mg/dl respectively, value below the normal levels of 40 to 150 mg/dl (Dahanukar et al., 1988). By the end of three months of supplementation with *T. cordifolia* a clear increment of the Ig M levels in all the subjects in the experimental group was observed. At the end of six months the subjects receiving the *T. cordifolia* recorded a maximum increment of 36.05 mg/dl whereas a reduction of 0.30 mg/dl was seen in the control group. The increase observed in the experimental group was significantly greater than that of control group at 1% level.

Changes in complement C3 levels before and after treatment

Table 4 gives the complementary C3 levels in

Table 4. Changes in complementary C3 levels before and after treatment.

Groups	Immunoglobulin A (mg/dl)				't' value
	Initial	After three months	Final (after six months)	Differences	
E (experimental group)	73.85±8.48	104.35±3.62	105.29±6.46	31.5±4.25	Between initial and final values E-15.46**; C-0.26^{NS}
C (control group)	72.69±7.56	78.23±3.09	77.89±4.82	4.5±5.47	Between groups E Vs C-14.95**

^{NS}- not significant **; significant at 1% level.

Table 5. Changes in complementary C4 levels before and after treatment.

Groups	Immunoglobulin A (mg/dl)				't' value
	Initial	After three months	Final (after six months)	Differences	
E (experimental group)	12.25±6.8	36.28±3.18	34.67±2.98	22.42±4.75	Between initial and final values 13.75**; C-0.36^{NS}
C (control group)	13.89±6.32	16.46±2.08	16.27±4.05	2.38±2.69	Between groups E Vs C-14.36**

^{NS}- not significant **; significant at 1% level.

postmenopausal women before and after treatment. The mean initial complementary C3 levels before the supplementation in the experimental and control group were 73.85 and 72.69 mg/dl respectively - values marking below the normal range of 80 to 170 mg/dl (Stanely et al., 1999) supplementation with *T. cordifolia* in the experimental group there was a gradual increment in the value to 88.21 and after three months to 104.35 mg/dl. When the supplementation study was continued for six months the complementary C3 level stood at 105.29 mg/dl showing significance at 1% level between initial and final values. In the control group there was not much difference between the experimental and the control groups (P<0.01).

Changes in complement C4 levels before and after treatment

Table 5 gives the C4 levels in the post menopausal women before and after treatment. The mean initial complementary C4 levels of the subjects in both groups were found to be 12.25 and 13.89 mg/dl against the normal level of 15 to 45 mg/dl. Over a period of three months, increment in the level of C4 were recorded in the experimental group treated with *T. cordifolia* (36.28 mg/dl) and after a treatment of six months there was an increment to 34.67 mg/dl in the experimental group. The increase in the complementary C4 levels in the experimental group was found to be significant at 1% level and there was also significance between the experimental and control group. C4 levels increment with supplementation with *T. cordifoli*a in albino rats is reported (Jagetia et al., 1998). This study is in accordance with the aforementioned results. Further, the aforementioned results on the biochemical parameters it could be observed that *T. cordifolia* has improved the biochemical markers tested which shows the potency of *T. cordifolia* in improving the immuno competence among the post menopausal women. It can be concluded from the aforementioned results that the water extract of *T. cordifolia* selected had beneficial effect in alleviating specific conditions like immuno competence and proved to have this potential and hence can be used in the

treatment of these common ailments encountered among post menopausal women. In this era of new and emerging varieties of diseases, existence of medical assistance without any side effects is much sought after remedy. Further, in the present days of ever changing life styles, men have greater chances of living longer and many women have longer innings to play in their post menopausal life and that too with larger and busy social activity. As a corollary, their eating pattern and other life styles are predominantly circumstantial which may precipitate the already complicated and/or invisible sufferings due to menopause.

Under this special need provision of an herbal treatment with no side effects but with great soothing/controlling effect on the peculiar ailments of the age is no doubt the welcome solution. In this context, the result of the present investigation assumes significance and a small step in such innovative findings on the hitherto under exploited herbal treasure, we in India have both in our ancient medical scriptures systems of medicine and widely/wildly grown in nature. It is up to us to unravel these great treasures of our country and utilise the bountiful natural resources in monitoring the ever increasing new ailments/conditions. So, let us not sleep over this, for tomorrow may be too late as “today” is the name for herbal remedies.

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