



## Effect of *Rasayana Ghana* tablet (An Ayurvedic formulation) on improving quality of life of stressed individuals

### Research article

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### Abstract

Stress is the most hazardous factor which can adversely affect the quality of life. Ayurvedic Rasayana formulations can be used to relieve stress and there forth improve and maintain healthy quality of life. In the present study, the effect of a classical ayurvedic *Rasayana* formulation comprising three herbs *Gokshura* (*Tribulus terrestris* Linn.), *Aamalaki* (*Embllica officinalis* Gaertn.) and *Guduchi* (*Tinospora cordifolia* Miers.) is assessed on health, wellness and quality of life questionnaire in stress prone patients. Total 108 patients complaining of stress and decreased quality of life were randomly divided into two groups of *Rasayana Ghana* tablets (RGT) and Placebo group (PG). The drug was given in a dose of two tablets of 500mg twice a day with ghee and honey in unequal proportion. Result was assessed on the parameters given in quality of life questionnaire. The data was then analyzed by applying Wilcoxon non parametric test in each group and chi-square test to compare efficacy in both groups. RGT seems to be effective in decreasing the physical complaints and improving mental/emotional state, adaptation to stress, life enjoyment and overall quality of life to a significant level in each sub scale.

**Key words:** Stress, Quality of life, *Rasayana*, *Gokshura* (*Tribulus terrestris* Linn.), *Aamalaki* (*Embllica officinalis* Gaertn.), *Guduchi* (*Tinospora cordifolia* Miers.).

### Introduction:

In today's era of throat cutting competition, stress is the inevitable factor of one's life leading to various stress related disorders. One can neither avoid stress nor stop functioning; Stress can disturb quality of life in many ways.

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Recent researches show that stress speeds the aging process by damaging the DNA.(1) Another study showed that long-term stress may cause illness by declining functions of immune system. Scientists have discovered stressful experiences can boost production of chemicals that regulate the body's immune system. (2) Thus stress can adversely affect quality of life of individual. This may be the reason that Charaka quoted *Aayasa* (stress) as the foremost factor to be avoided (3).

But stress is the most unavoidable factor in today's daily life. The ailments are overruling mankind and it is getting tougher for human being to fight against them. As described in Ayurveda, the



healthy life span is decreasing accordingly and that is all due to the 'missing life style management'. (4) So the world is distressed to fulfill all the goals of life in this shortened healthy life span. This is the most hazardous effect of physical and psychological stress. Dr. Hans Selye recognized the mind-body connection involved with stress. He concluded that stress is "the non-specific response of the body to any demand placed upon it." Selye claims that it is not stress that harms us but distress. Distress occurs when we prolong emotional stress and don't deal with it in a positive manner. The body's response to stress is known as the 'general adaptation syndrome'. There are many different causes of stress that affect the aging adult. These causes can produce a variety of responses that include both physical and emotional effects. There are preventative measures that can be taken to help reduce the effects of stress as well as different coping methods. (5) Therefore *Ayurveda*-the ancient wisdom and treatment modality bears the responsibility to combat the problem to help ailing society through the nectar on earth – *Rasayana* (rejuvenation). Therefore a search was carried out to find potent ayurvedic formulation with stress relieving properties. One such formulation described is *Rasayana Churna* (powder) described by *Vagbhata* in *Ashtanga Hridaya* in *Rasayana vidhi* chapter ( A.Hr. U. 39/ 159). It is the most profoundly used perfect combination of *Gokshura* (*Tribulus terrestris* Linn.), *Aamalaki* (*Embllica officinalis* Gaertn.) and *Guduchi* (*Tinospora cordifolia* Miers.) as *rasayana* with its benefits for maintaining sexual vigor, steadiness of body and mind, peacefulness, happiness and longevity with black hairs.(6) In classics *Vagbhata* has advocated the present *Rasayana* formulation in powder form. But considering the disease stress, the psychology of stressed patients and the advantages of *Ghana* form like longer shelf life, higher palatability and

convenience to transport, it was decided to convert the powder into *Ghana* form.

#### **Aims and Objectives:**

The present study was planned to evaluate the efficacy of *Rasayana* formulation in the form of *Rasayana ghana* tablet (RGT) to improve the quality of life of stressed patients.

#### **Materials and Methods:**

**Drug:** The *Rasayana Ghana* tablet was prepared in the pharmacy of Gujarat Ayurved University, Jamnagar. Coarse powder of all three herbs mentioned above was taken to prepare decoction and then *Ghana* was made. The *Ghana* was further processed to prepare tablets from it.

**Patients:** Patients attending the O.P.D. and I.P.D. of department of *Panchakarma* and *Manasa Roga*, Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar complaining of stress and fulfilling the criteria of inclusion were selected for the present study. An elaborative case taking proforma was specially prepared to evaluate the stress score and then to assess the effect of RGT to improve the quality of life.

**Inclusion Criteria:** Patients between the ages 16 to 60 years complaining of stress and decreased quality of life were included.

**Exclusion Criteria:** Patients with age less than 16 & above 60 years suffering from serious systemic diseases and stress due to any other cause were excluded from the study.

**Study Design:** It was a placebo controlled randomized prospective clinical study. Informed consent was taken from the patient before including them in the trial. The study protocol was approved by the institutional ethical committee. The method was interrogation about the points in stress rating scale and health wellness questionnaire. The subjects were asked to answer the question instantly without



thinking much in order to avoid bias and the early response was noted. The subjects were free to withdraw themselves from clinical study at any given point of time and were assured to keep the information confidential. The data was recorded and further analyzed with suitable statistical tests.

#### **Management and Grouping:**

Selected patients were randomly divided into two groups. All of them are given *Haritaki Churna* (powder of *Terminalia chebula*) in a dose of 5 g once a day for 3 consecutive days with luke warm water in early morning for *Koshtha & Srotas Shuddhi* before starting the medication.

- Group I (RGT) : *Rasayana Ghana tablet*, two tablets of 500 mg, two times a day
- Group II (PG) : Placebo tablet with identical size etc. two tablets of 500 mg, two times a day
- *Sevana kala* (Time): Early morning and in the evening
- Duration : Two months
- *Anupana* (Vehicle) : Cow's ghee and honey in unequal(2:1) proportion as mentioned in classics.

**Criteria for Assessment:** Quality of Life assessment scale was applied to appraise the improved quality of life by the effect of therapy.

Psychological counseling was done for all patients in both the groups.

**Statistical analysis:** The information gathered on the basis of above observations was subjected to statistical analysis. Wilcoxon signed rank test was applied to evaluate the effect of therapy in each group. Chi square test was applied to compare the efficacy in both groups. The results were interpreted at  $p < 0.05$ ,  $p < 0.01$  and  $p < 0.001$  significance levels. The value of  $P < 0.01$  was considered significant and the  $P < 0.001$  was considered as highly significant.

#### **Health, Wellness & Quality of Life Questionnaire:**

The quality of life questionnaire (7) comprising six subscales was adopted for the assessment of effect of therapy. The method was interrogation and the responses were recorded in the proforma, scores were calculated and subjected to statistical analysis. The detail questions in each sub-scale are enlisted in tables in the observation and results section. The scoring pattern is given below.

**I. Physical State :** Rate the questions with respect to frequency:

Scoring : Never : 1 Rarely : 2  
Occasionally : 3 Regularly : 4 Constantly : 5

**II. Mental/Emotional State:** Rate the questions with respect to frequency:

Scoring: Never: 1 Rarely: 2 Occasionally : 3 Regularly : 4 Constantly : 5

**III. Stress Evaluation:** Evaluate stress relative to the following:

Scoring : None : 1, Slight: 2, Moderate: 3, Pronounced: 4, Extensive: 5

**IV. Life Enjoyment:** Rate on a degree scale of 1-5:

Scoring : Not at all: 1;  
Slight:2; Moderate:3; Considerable:4;  
Extensive:5.

**V. Overall Quality of Life:** Evaluate the feelings relative to the quality of life:

Scoring : Terrible:1; Unhappy:2; Mostly Dissatisfied:3; Mixed:4; Mostly Satisfied:5; Pleased:6; Delighted:7.

**VI. Overall Impressions:**

Scoring : Better: 1; Same:2; Worse:3

The answer of each of the question in overall impression was noted with respect to when the person first came to office.

#### **Observations and Results**

Total 108 patients were registered for the present study with 56 in group RGT and 52 in group PG. Among them, total 70 i.e. 36 in RGT group and 34 in placebo group completed treatment. Maximum patients (39.81%) were in the age group of 31 to 40 years and were males (57.40%). The results are shown in Tables 1 to 5.



**Table 1: Effect of therapy on physical state :**

| Complaints   | RGT group |           |     |                | PG |           |        |                | $\chi^2$ | P      |
|--|-----------|-----------|-----|----------------|----|-----------|--------|----------------|----------|--------|
|  | n         | % of imp. | W   | P <sub>R</sub> | n  | % of imp. | W      | P <sub>p</sub> |          |        |
| 1. Presence of physical pain (neck/back ache, sore arms/legs, etc.).     | 35        | 31.85     | 561 | <0.01          | 33 | 12.97     | 136.00 | <0.01          | 23.31    | <0.001 |
| 2. Feeling of tension or stiffness or lack of flexibility in your spine. | 35        | 31.34     | 528 | <0.01          | 33 | 14.50     | 171.00 | <0.01          | 23.31    | <0.001 |
| 3. Incidence of fatigue or low energy.                                   | 35        | 35.66     | 630 | <0.01          | 33 | 17.29     | 253.00 | <0.01          | 17.84    | <0.001 |
| 4. Incidence of colds and flu.   | 35        | 24.00     | 153 | <0.01          | 33 | 10.41     | 45.00  | <0.05          | 30.08    | <0.001 |
| 5. Incidence of headaches (of any kind).                                 | 35        | 25.68     | 253 | <0.01          | 33 | 13.67     | 120.00 | <0.01          | 35.52    | <0.001 |
| 6. Incidence of nausea or constipation .                                 | 35        | 34.12     | 496 | <0.01          | 33 | 14.84     | 171.00 | <0.01          | 16.65    | <0.001 |
| 7. Incidence of menstrual discomfort.                                    | 10        | 11.53     | 6   | >0.05          | 11 | 9.09      | 6.00   | <0.5           | 00       | --     |
| 8. Incidence of allergies or skin rashes.                                | 32        | 10.76     | 21  | <0.05          | 32 | 10.00     | 28.00  | <0.05          | 65.52    | <0.001 |
| 9. Incidence of dizziness or light-headedness.                           | 34        | 15.49     | 66  | <0.01          | 33 | 7.92      | 28     | <0.05          | 63.34    | <0.001 |
| 10. Incidence of accidents   | 34        | 6.77      | 10  | <0.5           | 33 | 7.77      | 21.00  | <0.05          | 81.51    | <0.001 |



|   |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|
| or near accidents or falling or tripping. |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|

RGT: Rasayana Ghan tablet, PG: Placebo group, % of imp: percentage of improvement, W: Wilcoxon's value, P<sub>R</sub>: P value of Wilcoxon's test in RGT group, P<sub>p</sub>: P value of Wilcoxon's test in PG group,  $\chi^2$ : Chi square value, P: P value of Chi square test

**Table 2: Effect of therapy on Mental/Emotional State:**

| Complaints  | RGT group |           |     |                | PG |           |        |                | $\chi^2$ | P      |
|---|-----------|-----------|-----|----------------|----|-----------|--------|----------------|----------|--------|
|   | n         | % of imp. | W   | P <sub>R</sub> | n  | % of imp. | W      | P <sub>p</sub> |          |        |
| 1. If pain is present, how distressed are you about it?       | 35        | 33.09     | 630 | <0.01          | 33 | 18.79     | 300.00 | <0.01          | 26.21    | <0.001 |
| 2. Presence of negative or critical feelings about your self. | 35        | 34.28     | 630 | <0.01          | 33 | 17.29     | 253.00 | <0.01          | 26.21    | <0.001 |
| 3. Experience of moodiness or temper or angry outbursts.      | 35        | 32.82     | 595 | <0.01          | 33 | 17.55     | 253.00 | <0.01          | 26.21    | <0.001 |
| 4. Experience of depression or lack of interest.              | 35        | 34.05     | 630 | <0.01          | 33 | 17.55     | 253.00 | <0.01          | 23.31    | <0.001 |
| 5. Being overly worried about small things.                   | 35        | 33.08     | 595 | <0.01          | 33 | 16.03     | 210.00 | <0.01          | 26.21    | <0.001 |
| 6. Difficulty thinking or concentrating or indecisiveness.    | 35        | 35.00     | 595 | <0.01          | 33 | 16.03     | 210    | <0.01          | 21.07    | <0.001 |
| 7. Experience of vague  | 35        | 36.17     | 595 | <0.01          | 33 | 16.03     | 210    | <0.01          | 17.84    | <0.001 |



|   |    |       |     |       |    |       |        |       |       |        |  |
|---|----|-------|-----|-------|----|-------|--------|-------|-------|--------|--|
| fears or anxiety.                                       |    |       |     |       |    |       |        |       |       |        |  |
| 8. Being fidgety or restless; difficulty sitting still. | 35 | 32.35 | 496 | <0.01 | 33 | 15.26 | 190.00 | <0.01 | 26.21 | <0.001 |  |
| 9. Difficulty falling or staying asleep.                | 35 | 31.81 | 496 | <0.01 | 33 | 15.26 | 190.00 | <0.01 | 23.31 | <0.001 |  |
| 10. Experience of recurring thoughts or dreams.         | 35 | 31.57 | 465 | <0.01 | 33 | 16.03 | 210    | <0.01 | 23.31 | <0.001 |  |

**Table 3: Effect of therapy on Stress evaluation:**

| Complaints                      | RGT group |           |     |                | PG |           |        |                | $\chi^2$ | P      |
|---------------------------------|-----------|-----------|-----|----------------|----|-----------|--------|----------------|----------|--------|
|                                 | n         | % of imp. | W   | P <sub>R</sub> | n  | % of imp. | W      | P <sub>p</sub> |          |        |
| 1. Family.                      | 35        | 23.72     | 300 | <0.01          | 33 | 5.35      | 15.00  | <0.5           | 59.25    | <0.001 |
| 2. Significant Relationship.    | 35        | 24.56     | 300 | <0.01          | 33 | 7.27      | 36.00  | <0.05          | 57.39    | <0.001 |
| 3. Health.                      | 35        | 33.57     | 630 | <0.01          | 33 | 10.44     | 105.00 | <0.01          | 24.10    | <0.001 |
| 4. Finances.                    | 35        | 22.31     | 276 | <0.01          | 33 | 3.22      | 10.00  | <0.5           | 27.34    | <0.001 |
| 5. Sex Life.                    | 28        | 24.11     | 171 | <0.01          | 27 | 6.81      | 21.00  | <0.05          | 134.38   | <0.001 |
| 6. Work.                        | 35        | 34.01     | 435 | <0.01          | 27 | 16.10     | 171.00 | <0.01          | 29.26    | <0.001 |
| 7. School                       | 03        | 18.18     | 3   | <0.5           | 00 | 00        | 00     | 00             | 00       | --     |
| 8. General well-being.          | 35        | 36.61     | 630 | <0.01          | 33 | 15.90     | 210.00 | <0.01          | 19.29    | <0.001 |
| 9. Emotional well-being.        | 35        | 37.32     | 630 | <0.01          | 33 | 14.50     | 171.00 | <0.01          | 17.84    | <0.001 |
| 10. Coping with daily problems. | 35        | 37.76     | 630 | <0.01          | 33 | 12.97     | 153.00 | <0.01          | 17.84    | <0.001 |

**Table 4: Effect of therapy on Life Enjoyment:**

| Complaints  | RGT group |           |       |                | PG |           |          |                | $\chi^2$ | P      |
|---|-----------|-----------|-------|----------------|----|-----------|----------|----------------|----------|--------|
|   | n         | % of imp. | W     | P <sub>R</sub> | n  | % of imp. | W        | P <sub>p</sub> |          |        |
| 1. Openness to guidance to your "inner voice/feelings | 35        | ↑47.12    | - 506 | <0.01          | 33 | ↑30.12    | - 231.00 | <0.01          | 11.68    | <0.001 |
| 2. Experience of relaxation                           | 35        | ↑66.26    | - 630 | <0.01          | 33 | ↑36.14    | - 300.00 | <0.01          | 12.31    | <0.001 |



|   |    |        |       |       |    |        |          |       |       |        |
|---|----|--------|-------|-------|----|--------|----------|-------|-------|--------|
| or ease or well-being   |    |        |       |       |    |        |          |       |       |        |
| 3. Presence of positive feelings about yourself                           | 35 | ↑65.47 | - 630 | <0.01 | 33 | ↑33.33 | - 300.00 | <0.01 | 11.05 | <0.001 |
| 4. Interest in maintaining a healthy lifestyle (e.g., diet, fitness, etc) | 35 | ↑64.28 | - 630 | <0.01 | 33 | ↑32.14 | - 300.00 | <0.01 | 11.33 | <0.001 |
| 5. Feeling of being open and aware/connected when relating to others      | 35 | ↑60.00 | - 595 | <0.01 | 33 | ↑30.95 | - 276.00 | <0.01 | 11.65 | <0.001 |
| 6. Level of confidence in your ability to deal with adversity             | 35 | ↑65.06 | - 630 | <0.01 | 33 | ↑33.73 | - 300.00 | <0.01 | 11.33 | <0.001 |
| 7. Level of compassion for, and acceptance of, others                     | 35 | ↑65.06 | - 630 | <0.01 | 33 | ↑32.53 | - 276.00 | <0.01 | 11.05 | <0.001 |
| 8. Satisfaction with the level of recreation in your life                 | 35 | ↑61.90 | - 595 | <0.01 | 33 | ↑32.53 | - 276.00 | <0.01 | 11.05 | <0.001 |
| 9. Incidence of feelings of joy or happiness                              | 35 | ↑61.90 | - 595 | <0.01 | 33 | ↑34.14 | - 276.00 | <0.01 | 12.56 | <0.001 |
| 10. Level of satisfaction with your sex life                              | 31 | ↑54.92 | - 378 | <0.01 | 29 | ↑32.39 | - 190.00 | <0.01 | 17.67 | <0.001 |
| 11. Time devoted to things you enjoy                                      | 35 | ↑58.02 | - 496 | <0.01 | 33 | ↑29.76 | -253     | <0.01 | 12.02 | <0.001 |

↑ -Increase



**Table 5: Effect of therapy on overall QOL:**

| Complaints   | RGT group |           |          |                | PG |           |          |                | $\chi^2$ | P      |
|--|-----------|-----------|----------|----------------|----|-----------|----------|----------------|----------|--------|
|  | n         | % of imp. | W        | P <sub>R</sub> | n  | % of imp. | W        | P <sub>p</sub> |          |        |
| 1. Your personal life.                                     | 35        | ↑41.32    | - 561.00 | <0.01          | 33 | ↑14.65    | - 153.00 | <0.01          | 84.78    | <0.001 |
| 2. Your wife/husband or "significant other                 | 35        | ↑38.01    | - 496.00 | <0.01          | 33 | ↑12.93    | - 120.00 | <0.01          | 57.39    | <0.001 |
| 3. Your romantic life.                                     | 32        | ↑36.69    | - 435.00 | <0.01          | 28 | ↑13.40    | - 91.00  | <0.01          | 63.34    | <0.001 |
| 4. Your job.   | 32        | ↑49.50    | - 406.00 | <0.01          | 25 | ↑23.68    | - 120.00 | <0.01          | 27.97    | <0.001 |
| 5. Your co-workers.  | 31        | ↑51.04    | - 435.00 | <0.01          | 25 | ↑23.37    | - 136.00 | <0.01          | 41.15    | <0.001 |
| 6. The actual work you do.                                 | 33        | ↑49.52    | - 465.00 | <0.01          | 25 | ↑23.68    | - 136.00 | <0.01          | 43.82    | <0.001 |
| 7. The handling of problems in your life.                  | 35        | ↑49.10    | - 528.00 | <0.01          | 33 | ↑21.15    | - 210.00 | <0.01          | 30.08    | <0.001 |
| 8. What you are actually accomplishing in your life.       | 35        | ↑48.67    | - 528.00 | <0.01          | 33 | ↑18.69    | - 190.00 | <0.01          | 43.71    | <0.001 |
| 9. Your physical appearance - the way you look to others.  | 35        | ↑43.47    | - 496.00 | <0.01          | 33 | ↑19.62    | - 190.00 | <0.01          | 43.71    | <0.001 |
| 10. Your self.   | 35        | ↑47.32    | - 561.00 | <0.01          | 33 | ↑21.69    | - 210.00 | <0.01          | 43.71    | <0.001 |
| 11. Your ability to adjust to change in your life.         | 35        | ↑47.36    | - 561.00 | <0.01          | 33 | ↑21.49    | - 231.00 | <0.01          | 57.39    | <0.001 |
| 12. Your life as a whole.                                  | 35        | ↑46.90    | - 528.00 | <0.01          | 33 | ↑21.49    | - 231.00 | <0.01          | 57.39    | <0.001 |
| 13. Overall contentment with your life.                    | 35        | ↑45.21    | - 561.00 | <0.01          | 33 | ↑22.64    | - 231.00 | <0.01          | 43.71    | <0.001 |
| 14. The extent to which your life has been as you want it. | 35        | ↑47.36    | - 561.00 | <0.01          | 33 | ↑21.49    | - 231.00 | <0.01          | 57.39    | <0.001 |



**Table 6: Effect of therapy on overall impression by RGT and PG:**

| Impression                                 | RGT(% patients) |      |       | PG(% patients) |       |       | $\chi^2$ | P      |
|--|-----------------|------|-------|----------------|-------|-------|----------|--------|
|  | Better          | Same | Worse | Better         | Same  | Worse |          |        |
| 1. Overall my physical well-being is:      | 91.42           | 8.57 | 0.00  | 48.48          | 51.51 | 0.00  | 11.65    | <0.001 |
| 2. Overall my mental/emotional state is:   | 91.42           | 8.57 | 0.00  | 66.66          | 33.33 | 0.00  | 14.80    | <0.001 |
| 3. Overall my ability to handle stress is: | 97.14           | 2.85 | 0.00  | 66.66          | 33.33 | 0.00  | 17.84    | <0.001 |
| 4. Overall my enjoyment of life is:        | 91.42           | 8.57 | 0.00  | 66.66          | 33.33 | 0.00  | 14.80    | <0.001 |
| 5. Overall my quality of life is:          | 94.28           | 5.71 | 0.00  | 66.66          | 33.33 | 0.00  | 16.65    | <0.001 |

## Discussion

### *Improvement in Physical State*

As it is seen in introduction stress can affect the body at various levels including gross to subtlest levels; at systemic as well as cellular levels. Stress and parallel pathological processes can cause huge damage to almost all cells of body. This leads to gross decline in the physical state of the person. The quality of life questionnaire enlists some of the major subjective declines in physical state. The data (table 1) shows that RGT significantly improved almost all the physical complaints related to quality of life. It can be seen that placebo also decreased some of the physical complaints like physical pain, tense feeling, fatigue, headache, nausea and constipation up to significant level. The other parameters were not significantly affected. RGT showed good results over placebo in physical state parameters in quality of life questionnaire and the effect was statistically highly significant ( $p < 0.001$ ) in all the parameters. This may be due to stress relieving properties of RGT.

### *Improvement in Mental/Emotional State*

The data on mental/emotional state illustrates that RGT significantly improved

all the aspects of mental state in quality of life questionnaire (table 2). The data indicates the efficacy of placebo on mental/emotional state which was observed significant in all aspects. But the effect was meager in terms of percentage. With respect to the effect on mental/emotional state, it was observed that RGT showed statistically significant ( $p < 0.001$ ) results in all the parameters. The effect again signifies the psychotropic action of RGT. By the adaptogenic, anti-stress, antidepressant, anxiolytic properties, RGT acted upon to relieve these complaints. The little effect shown by placebo may be due to effect of vehicle ghee and honey.

### *Improvement in Stress evaluation:*

In the stress evaluation related to quality of life, RGT improved almost all the responses to stress in all aspects to a significant extent (table 3). Placebo also showed positive significant response in some aspects like health, work, general well being, emotional well being and coping with daily problems. The other parameters were not relieved upto significant mark. In the stress evaluation score, RGT showed nearly three times greater effect than that of placebo in terms



of percentage and the results were highly significant ( $p < 0.001$ ) on applying chi square test. All these factors are worthy to think about while dealing with the stressed patient. It is a matter of fact that one can't avoid the day to day stress, but the reaction to stress can be positively improved by taking adaptogenic drugs. The effect again points towards importance of RGT in stress relief.

#### **Improvement in Life Enjoyment:**

One of the most remarkable effect seen in this present study was that shown by RGT in life enjoyment parameters of QoL. RGT significantly improved the positive things about oneself in life enjoyment parameters like openness to guidance to one's inner voice/feelings (47.12%), experience of relaxation or ease or well-being (66.26%), presence of positive feelings about oneself (65.47%), interest in maintaining a healthy lifestyle (e.g., diet, fitness, etc) (64.28%), level of confidence in self ability to deal with adversity (65.06%), level of satisfaction with one's sex life (54.92%), Time devoted to things you enjoy (58.02%) and satisfaction with the level of recreation in self life (61.90%). It also empowered the positive social aspects of life such as feeling of being open and aware/connected when relating to others (60%), level of compassion for, and acceptance of others (65.06%), incidence of feelings of joy or happiness (61.90%). All the parameters were found improved by RGT twice that of placebo and the difference was highly significant ( $p < 0.001$ ) (table 4). The effect of RGT on the positive symptoms may be due to anti-depressant, anxiolytic property of trial drug. The effect observed in symptoms related to social responses may be due to anti-stress, adaptogenic activity of RGT which first relieves stress and then produces relaxation and joy in mind. This ultimately leads to increased endurance showing positive exogenous response.

#### **Improvement in overall QOL and overall impression after treatment:**

RGT showed better significant effect in all the parameters included in overall quality of life (table 5). Placebo also resulted in significant improvement in overall quality of life parameters, but the result was nearly half than RGT in terms of percentage. Highly significant ( $p < 0.001$ ) difference in the effect of RGT and placebo on the parameters of overall quality of life was observed in terms of percentage as well as statistics. In the last overall impression in quality of life parameters maximum i.e. over 90% patients stated they had a better feeling in all parameters by the treatment of RGT. When the difference between the RGT effect and placebo was analyzed statistically, it was found highly significant at the level of 0.001 (table 6). The reasons behind the action are described in the above paragraph. It can be easily inferred that as the stress increases, the quality of life decreases to the hazardous physical and psychological impact of stress. As the medicine and psychological counseling improves the adaptation to stress, the quality of life tends to improve as it has been documented by the above data.

#### **Probable mode of action of drug:**

As stated in introductory part RGT is a tri herbal compound comprising of *Tinospora cordifolia*, *Emblica officinalis* and *Tribulus terrestris*. Among these *Tinospora cordifolia* is with proven stress-attenuating activity. (8) In addition, *Tinospora cordifolia* is reported to show positive actions viz. adaptogenic (9,10) antioxidant (11,12,8) immunomodulatory (13-15), anti-inflammatory (16) in experimental animals. It is also known to possess beneficial effects on learning, stress and memory. (17) *Tinospora* was also found to possess protective effect against lead induced hepatotoxicity through moderate antioxidant activity. (18) On a whole the possibility of RGT acting through



correcting the psycho-neuro-endocrinal axis (hypothalamo- pituitary axis) can not be denied. Many reports have proved that *Emblica officinalis* is having immunomodulatory activity, adoptogenic and antioxidant activity. (19-26) Earlier studies on formulation containing *Guduchi* (*Guduchyadi ghrita*) and *Aamalaki* (*Bhringarajadi rasayana*) showed potent antidepressant, anti stress, anxiolytic activity. (27) The studies on *Tribulus terrestris* (*Gokshuru*) suggest that the Harmine content of *Tribulus* acts as Monoamine Oxidase (MAO) inhibitor, leading to higher levels of dopamine in the brain. Due to higher levels of dopamine, the mood is elevated slowly and the stronger and better is the feeling. (28) Further honey (29-31) and ghee(32) are also proven for their anti-oxidant and

adaptogenic activities. Thus the observed and anxiolytic and anti-depressant profile of RGT may be attributed to one or more bioactive principles present in these drugs. There may be synergetic herb-herb interactions enhancing the total efficacy of the formulation. RGT has showed significant anti-oxidant and anti-stress activity in experimental animals. (33) The exact mechanism action of the drug needs to be evaluated by further extensive studies.

The cumulative properties of RGT include *Madhura rasa* (sweet taste), *Tikta rasa* (bitter taste), *Madhura Vipaka*, *Sheeta Virya*, *Guru* , *Snigdha* ,*Yogavahi guna*, *Medhya Rasayana* and *Tridosha shamaka* properties. The pharmacokinetic mode of action is shown in table below:

| Property of RGT formulation | Beneficial effects to relieve stress and improve quality of life  | Benefit   |
|-----------------------------|---|---|
| <i>Madhura rasa</i>         | <i>Vata Pitta shamaka</i> and <i>Kapha vardhaka</i><br><i>Sharira satmya</i> (compatible to body), <i>Sapta dhatu</i> and <i>Oja vivardhaka</i> , <i>Aayushya</i> (increasing longevity), <i>Shad indriya prasadano</i> ( creates happiness in all sense organs including mind) , <i>bala-varna karah</i> (improves strength and complexion), alleviates <i>Pitta</i> , <i>Visha</i> , <i>Vata</i> , <i>Trishna</i> , <i>Daha</i> , also having <i>Twachya</i> , <i>Keshya</i> , <i>Kanthya</i> (improves skin texture, hair quality and voice quality) , <i>Preenana</i> ( instantly nourishing), <i>Jeevana</i> (improving quality of life), <i>Tarpana</i> (nurtures), <i>Brimhana</i> , <i>Sthairyakarah</i> , <i>Jivha pralhadano</i> . (34)<br>At psychic level, <i>Sattva</i> enhancing activity, due to <i>snigdha</i> , <i>sthira</i> qualities. (35) It can reduce <i>Rajas</i> . | -Relieves stress at physical and psychic level<br>-Improves adaptation<br>-Can provide overall energy, nourishment and stability to the tissues |
| <i>Madhura Vipaka</i>       | Promotes normal <i>Kapha</i> , pacifies <i>Vata</i> and <i>Pitta dosha</i> , promotes semen and helps in proper   | Important qualities to alleviate stress and its adverse psychological signs.<br>Can potentiate the activities of                                |



|                                 |   |   |
|---------------------------------|---|---|
|                                 | elimination of stool and urine. (36)<br>Leads to <i>Aalhada</i> i.e. soothing and delightfulness. (37)<br>Can produce <i>Soumanasya</i> (sense of well being), <i>Bala</i> (power), <i>Utsaha</i> (enthusiasm), <i>Harshana</i> (pleasure), <i>Sukham</i> (happiness). (38) | <i>Madhura rasa</i> as mentioned above.   |
| <b>Sheeta Virya</b>             | At psychic level, <i>Sheeta</i> can produce <i>Lhadana</i> (delightening of mind) (39),<br>At physical level it can aggravate <i>Kapha - Vata</i> and pacifies <i>Pitta dosha</i> . (40)  | Soothing and calming effect necessary for relaxation of mind in stress. Sedative property may be helpful to relieve agitation and anxiety.  |
| <b>Guru and Snigdha guna</b>    | Can pacify <i>Vata</i> and promote <i>Kapha</i> .<br>Can show <i>Dhatu vridhhi</i> , <i>snehana</i> and <i>brimhana</i> actions. (41)   | <i>Guru</i> can lead to <i>sthairya</i> (stability), greater adaptation capacity, promote proper sleep and provide nourishment to prevent degeneration due to stress.<br>On body tissues, <i>Snigdha guna</i> shows nourishing effect, with <i>snehana</i> and <i>brimhana</i> actions. |
| <b>Medhya Rasayana</b>          | Due to <i>Guduchi</i> . (42) <i>Goghrita</i> is known to facilitate all the three mental faculties <i>Dhi</i> (intellect), <i>Dhriti</i> (retention), and <i>Smriti</i> (memory).   | Helps to regain and restore positive mental health in stress.   |
| <b>Dosha Shamaka properties</b> | <i>Tridosha shamaka</i> (predominance in <i>Vata-Pitta Shamana</i> and <i>Kapha vardhan</i> activity)   | Re establish <i>Samya avastha</i> (homeostasis) (43) by pacifying the <i>Vata</i> and <i>Pitta dosha</i> vitiated in stress and also increase <i>Kapha</i> depleted due to stress.  |

Thus *Rasayana Ghana* tablet can be useful in treating the stress related disorders as well as to improve and maintain quality of life in the era of competition.

### Conclusion

From the above data, it can be concluded that *Rasayana* formulation was effective in decreasing the physical complaints related to quality of life, improving the mental and emotional state, decreasing stress evaluation score in various aspects of life, increasing life enjoyment parameters and thus overall quality of life. It can be easily inferred that as the stress increases, the quality of life decreases to the hazardous physical and psychological impact of stress. As the medicine *Rasayana Ghana* tablet improves the adaptation to stress, the quality of life

tends to improve as it has been documented by the above data.

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