J.R.A.S. Vol. XXVI, No. 3-4, (2005) pp.54-73

STUDIES ON RASAYANA THERAPY AND ANTISTRESS EFFECT OF *ASHWGANDHA (WITHANIA SOMNIFERA)* - A SCIENTIFIC STUDY

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(Received on 20.5.2005)

For the study of Rasayana & antistress effect of Ashwagandha, 50 patients suffering from stress disorders were treated with Ashwagandha Churna for 3 months.

The observations revealed statistically significant improvement in various factors indicating Rasayana Prabhava viz, Smriti, Medha, Arogya, Prabha, Varna, Swara, Dehabala, Indriyabala and stress after the therapy.

It can be concluded from the present study that the Ashwagandha (Withania somnifera) is a good Rasayana drug as it improves the mental faculties, physical strength, possesses potent antistress activity due to its psychotropic & tranquillizing effects. Ashwagandha is a potent immunomodulator drug.

Introduction

In present context, human beings are living in the perpetual state of ever increasing stressful situations arising from the current life style, environmental pollution, highly ambitious and competitive life styles, over population, monotony and boredom of complex interpersonal relationships, job responsibilities and many other associated mental and emotional causes. The ever growing stress & strain in life leads to deterioration in various mental and physiological functions of body which

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hampers in leading a satisfactory and joyful life.

A large number of clinicians & biologists have shown interest in the study of the phenomenon of stress but so for the Western medicine has not been able to crystallize its approach in the prevention and treatment of such disorders. Therefore, attempts are being made to explore the herbal resources of *Ayurvedic* medicine to develop suitable remedies for the management of stress. In this respect, *Rasayana* drugs are supposed to be very effective as they rejuvenating effect on body as well as mind.

All the *Rasayana drugs* are supposed to improve the mental faculties, in addition to producing their beneficial effects on one's body, so called *Rasayana Prabhava*. It is postulated that a suitably tranquillized mind or in other words, a mind free from stress, permits improved mental functions. A large number of *Rasayana Drugs* are considered to have potent antistress effects. Among such drugs '*Ashwagandha*' is supposed to be the best *Rasayana* and antistress.

The present study has been conducted with the objective to evaluate clinically the therapeutic effect of a *Rasayana* drug *Ashwagandha (Withania somnifera)* with special reference to it's anti-stress effects in a series of patients suffering from stress.

Materials & Methods

For Clinical Studies 50 subjects suffering from various types of stress, in the age group of 40-60 years were registered for the present trial on the basis of a specially designed proforma for the purpose.

Patients with acute illnesses like Myocardial Infarction (M.I.), Cerebrovascular Accident (C.V.A.), Congestive Heart Failure (C.H.F.) and major Psychiatric Illnesses were excluded.

The drug *Ashwagandha* was selected for the present study in view of its evaluation for its *Rasayana* & Antistress effects. Prior to administration of *Ashwagandha*, for *Samshodhana Karma*, all the patients were administered '*Haritakyadi Churna*' described in *Charaka Samhita* (Ch. 1/1/25), in the dose of 3-5 grams at bed time, with luke warm water for 3-5 days, according to the condition of their *Kostha*. Afterwards, they were put to the use *Ashwagandha* powder in the dose of 5 gms b.d. with luke warm water for a period of 3 months.

Critarias of Assessment

During the trial & follow up study the patients were assessed on the basis of following parameters.

i) Subjective Improvement

Attempts were made to work out the incidence of Subjective improvement

produced by the drug under trial in the form of any growing feeling of well being, physical and mental fitness, if any, produced after the therapy. In addition all the patients were assessed in terms of various *Rasayana Prabhava* (effects) produced in their body on the basis of the verse regarding *Rasayana* effects described in *Charaka Samhita (Chi.1/7-8).*

ii) Clinical Improvement

All patients were assessed periodically in terms of improvement in the following symptoms after the *Ashwagandha* therapy.

1. Lack of interest in surroundings 2. Inability to concentrate/ make decisions 3. Irritability 4. Crying spells 5. Mood disturbances 6. Change in work schedule 7. Headache 8. Restlessness 9. Sweating 10. Tremors 11. Tachycardia 12. Poor appetite 13. Constipation 14. Depression 15. Setting stress or excitement about external events 16. Lassitude.

iii) Physiological Improvement

It was assessed in terms of changes in the following factors.

a) Changes in body weight in kgs.

b) Changes in Blood Pressure in mm. Hg.

c) Changes in Pulse Rate per minute.

d) Changes in Respiration Rate per minute.

e) Changes in Breath Holding Time in seconds, before & after the *Ashwagandha* therapy.

iv) Psychological Improvement

It was assessed in terms of :

a) Anxiety Level

b) Adjustment Level

c) Immediate Memory Span

d) Mental Fatigue Rate

e) Sleep Pattern, before & after the *Ashwagandha* therapy

a) Anxiety Level

For assessment of Anxiety level, Sinha Anxiety Scale (Sinha W.A. self analysis form) constructed by D. Sinha, Prof. & Head of the Deptt. of Psychology, Allahabad University, Allahabad, was used. It is a self administered evaluating scale. The scale contains 100 questions to which patient has to answer in 'Yes' or 'No' after reading them carefully. The positive score gives directly the percentage of Anxiety level. Statistical difference before and after the therapy was worked out.

b) Adjustment Level

For the assessment of 'Adjustment Level' self-administered Adjustment Scale, constructed by Dr. Ramrishi Tripathi published by Raghuveer Sharma Publications, Varanasi U.P., was used. The

scale consists of 82 question to which patients answers in either affirmation or negation. The difference produced after 3 months of therapy was evaluated statistically.

c) Immediate Memory Span

Immediate Memory Span was assessed by self-administered scale of Immediate Memory Span test (M.C. Joshi's digit renouncement test). It was done in two ways :

i) Direct Test - Digits were spoken in forward direction, like 1,2,3,4.....

ii) Indirect Test - Digits were spoken in backward direction, like 9,8,7,6..... Patients were required to reproduce the digits. Any change in the capacity of individual to renounce the digits before and after the therapy was worked out.

d) Mental Fatigue Rate

Mental Fatigue Rate was assessed by asking the patients to cut a particular digit in the sheet prescribed same process was adopted before and after treatment. It was decided to assess Mental Fatigue Rate on two parameters.

i) Time consumed for completing a specific task before & after the therapy.

ii) Mistakes committed for completing the task before and after the therapy.

e) Sleep Pattern

Sleep Pattern was assessed in each individual with the help of scale developed by Prof. A.K. Sharma *et al.* consisting of following points

a) Difficulty in initiating sleep.

b) Disturbed sleep.

c) Perception of insufficient sleep.

d) Early Morning awakening.

f) Haematological Assessment

Certain Haematological investigations like Hb gm%, E.S.R., T.L.C. & D.L.C. were conducted in these cases to evaluate the changes produced by the treatment given.

g) Biochemical Assessment

In order to assess the biochemical changes attributable to the treatment given, the following investigations were carried out.

a) Serum Cholesterol in mg/dl

b) Serum Triglycerides in mg/dl

c) High Density Lipoproteins (H.D.L.) in mg/dl

d) Low Density Lipoproteins (L.D.L.) in mg/dl

e) Very Low Density Lipoproteins (V.L.D.L.) in mg/dl

The observations made & results obtained after clinical trial were computed statistically to draw various conclusions.

Table I

Showing the pattern of *Rasayana* effect produced in 50 registered patients of stress after *Ashwagandha* Therapy

S.No.	*Rasayana* Effects	Mean B.T.	Mean A.T.	Mean Diff.	S.D.±	S.E.	t	p	Result
01.	*Smriti*	1.48	2.34	0.86	0.4964	0.0720	12.25	< 0.001	HS
02.	*Medha*	1.80	1.98	0.18	0.38808	0.05488	3.27	<0.01	S
03.	*Arogya*	1.72	3.00	1.28	0.4965	0.07021	18.23	< 0.001	HS
04.	*Prabha*	1.86	2.02	0.16	0.3696	0.0522	3.06	<0.01	S
05.	*Varna*	1.78	1.90	0.12	0.3282	0.0464	2.58	<0.02	NS
06.	*Swara*	2.08	2.14	0.06	0.2398	0.0339	1.76	< 0.1	NS
07.	*Dehabala*	1.76	2.98	1.22	0.4186	0.05917	20.60	< 0.001	HS
08.	*Indriyabala*	1.90	1.92	0.02	0.1414	0.0199	1.005	> 0.1	NS

HS = Highly Significant S = Significant NS = Not Significant

Table II
Showing the pattern of Physiological Changes produced in 50 registered patients of stress after *Ashwagandha* Therapy

S.No.	Physiological Parameters	Mean B.T.	Mean A.T.	Mean Diff.	S.D.±	S.E.	t	p	Result
01.	Body Weight in Kg.	56.57	58.10	1.53	1.49	0.21	7.25	< 0.001	HS
02.	Systolic Blood Pressure in mmHg	119.78	116.04	3.74	6.49	0.92	4.07	< 0.001	HS
03.	Diastolic Blood Pressure in mmHg	69.96	69.48	0.48	4.72	0.67	0.72	> 0.1	NS
04.	Pulse Rate per minute	81.44	76.8	4.64	7.14	1.01	4.59	< 0.001	HS
05.	Respiration Rate per minute	17.0	16.28	0.72	1.1002	0.1556	4.62	< 0.001	HS
06.	Breath Holding Time in seconds	25.2	31.12	5.92	4.40519	0.6229	9.50	< 0.001	HS

HS = Highly Significant NS = Not Significant

Table III
Showing the pattern of Antistress Effect produced in 50 registered patients of stress after *Ashwagandha* Therapy

S.No.	Symptoms	Mean B.T.	Mean A.T.	Mean Diff.	S.D.±	S.E.	t	p	Result
01.	Lack of interest in surrounding	1.8	0.61	1.19	0.7495	0.1635	7.28	< 0.001	HS
02.	Inability to concentrate/ Make decision	2.0	0.74	1.26	0.8673	0.1226	10.27	< 0.001	HS
03.	Irritability	2.02	0.52	1.5	0.7935	0.1196	12.54	< 0.001	HS
04.	Crying spell	2.0	1.5	0.5	0.6882	0.1539	3.24	< 0.01	S
05.	Mood Disturbances	2.06	0.88	1.18	0.8645	0.1222	9.65	< 0.001	HS
06.	Change in work schedule	2.07	1.76	0.31	0.4742	0.0931	3.30	< 9.01	S
07.	Headache	2.25	1.04	1.21	0.8628	0.1246	9.69	< 0.001	HS
08.	Restlessness	2.0	1.04	0.96	0.7223	0.1540	6.19	< 0.001	HS
09.	Sweating	2.0	1.63	0.37	0.4976	0.1143	3.14	< 0.01	S
10.	Tremors	1.92	1.076	0.84	0.5417	0.1504	5.58	< 0.001	HS
11.	Tachycardia	2.0	1.11	0.89	0.8053	0.1579	5.57	< 0.001	HS
12.	Poor Appetite	2.02	1.8	0.22	0.4857	0.0821	3.40	<0.01	S
13.	Constipation	2.16	1.9	0.26	0.4512	0.0825	3.15	< 0.01	S
14.	Depression	2.09	1.29	0.86	0.5345	0.1167	7.34	< 0.001	HS
15.	Setting stress or excitement about external events	2.4	1.11	1.29	0.839	0.1186	10.96	< 0.001	HS
16.	Lassitude	2.38	1.38	1.0	0.8329	0.1178	8.48	< 0.001	HS

HS = Highly Significant S = Significant NS = Not Significant

Table IV
Showing the pattern of Psychological Changes produced in 50 registered patients of stress after *Ashwagandha* Therapy

S.No.	Physiological Parameters		Mean B.T.	Mean A.T.	Mean Diff.	S.D.±	S.E.	t	p	Result
01.	Anxiety Level		2.72	1.34	1.38	0.6883	0.0973	13.76	<0.001	HS
02.	Immediate Memory Span	Direct Test	5.22	6.46	1.24	1.0838	0.1532	8.09	<0.001	HS
		Indirect Test	4.56	5.3	0.74	0.6642	0.0939	7.88	<0.001.	HS
03.	Mental Fatigue Rate	Time Consumed (in min.)	12.4	8.42	3.98	1.870	0.265	15.01	<0.001	HS
		Mistakes Committed	8.28	4.72	3.56	1.8202	0 2574	13.83	<0.001	HS
04.	Adjustment Level		1.62	2.14	0.52	0.5046	0.07137	7.2	<0.001	HS
		Difficulty in initiating Sleep	2.77	2.48	0.29	0.4614	0.0829	3.49	<0.01	S
		Disturbance in Sleep	2.24	0.67	1.57	0.6123	0.0874	17.96	<0.001	HS
05.	Sleep Pattern	Perception of insufficient Sleep	1.98	1.22	0.76	0.5554	0.0785	9.68	<0.001	HS
		Early Morning Awakening	1.60	1.26	0.34	0.4887	0.1020	3.33	<0.01	S

HS = Highly Significant

NS = Not Significant

Table V
Showing the pattern of Haematological Changes produced in 50 registered patients of stress after *Ashwagandha* Therapy

S.No.	Hoematological Parameters	Mean B.T.	Mean A.T.	Mean Diff.	S.D.±	S.E.	t	p	Result
01.	Haemoglobin (Hb) gm%	12.61	13.17	0.57	0.7677	0.1 096	4.43	< 0.001	HS
02.	Erythrocyte.sedimentation Rate (E.S.R.)	16.24	14.14	2.1	3.23	0.46	4.59	< 0.001	HS
03.	Total Leucocyte Count (T.L.C.) per cu.mm.	6822	6545	277	464.36	65.67	4.22	< 0.001	HS
04.	Polymorphs (P)%	65.62	67.64	2.02	2.29	0.3238	6.23	< 0.001	HS
05.	Lymphocytes (L)%	31.76	29.12	2.64	2.3651	0.3344	7.89	< 0.001	HS
06.	Eosinophils (E)%	1.36	1.2	0.16	0.59054	0.0836	1.89	< 0.1	NS
07.	Basophils (B)%	00	00	00	00	00	00	> 0.1	NS
08.	Monocytes (M)%	1.26	2.04	0.78	1.0735	0.1533	5.18	< 0.001	HS

HS = Highly Significant NS = Not Significant

Table VI

Showing the pattern of Biochemical Changes produced in 50 registered patients of stress after *Ashwagandha* Therapy

S.No.	Biochemical Parameters	Mean B.T.	Mean A.T.	Mean Diff.	S.D.±	S.E.	t	p	Result
01.	Serum Cholesterol mg/dl	177.295	169.52	7.78	22.16	4.95	1.57	>0.1	NS
02.	Serum Triglycerides mg/dl	127.124	125.64	1.484	13.63	3.04	1.15	>0.1	NS
03.	High Density Lipoprotein (H.D.L.) mg/dl	55.16	56.14	.0.98	5.23	1.17	0.65	>0.1	NS
04.	Low Density Lipoprotein (L.D.L.) mg/dl	96.70	89.25	7.45	19.23	4.3	1.73	<0.1	NS
05.	Very Low Density Lipoprotein (V.L.D.L.) mg/dl	25.42	25.13	0.29	2.73	0.61	0.47	>0.1	NS

NS = Not Significant

Table VII

Showing the overall improvement in different parameters of assessment in 50 registered patients of stress after *Ashwagandha* Therapy

S.No.	Parameters of Assessment	Mean "t" Value	"p" Value	Result
1.	*Rasayana Prabhava*	7.84	<0.001	HS
2.	Antistress Effect	6.86	<0.001	HS
3.	Physiological	5.12	<0.001	HS
4.	Psychological	10.02	<0.001	HS
5.	Haematological	4.3	<0.001	HS
6.	Biochemical	1.1	<0.1	NS

HS = Highly Significant NS = Not Significant

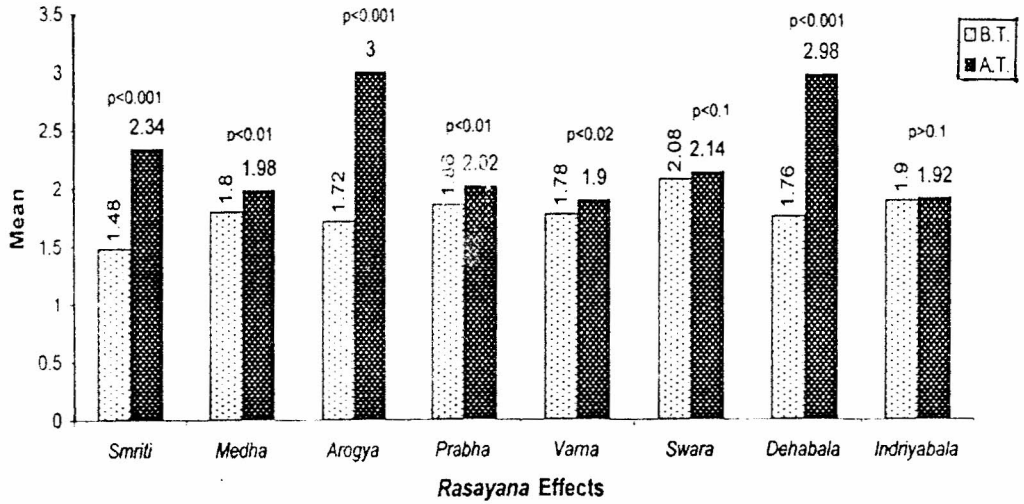


Figure No. 1: Showing the pattern of *Rasayana* effect produced in 50 registered patients of stress after *Ashwagandha* Therapy

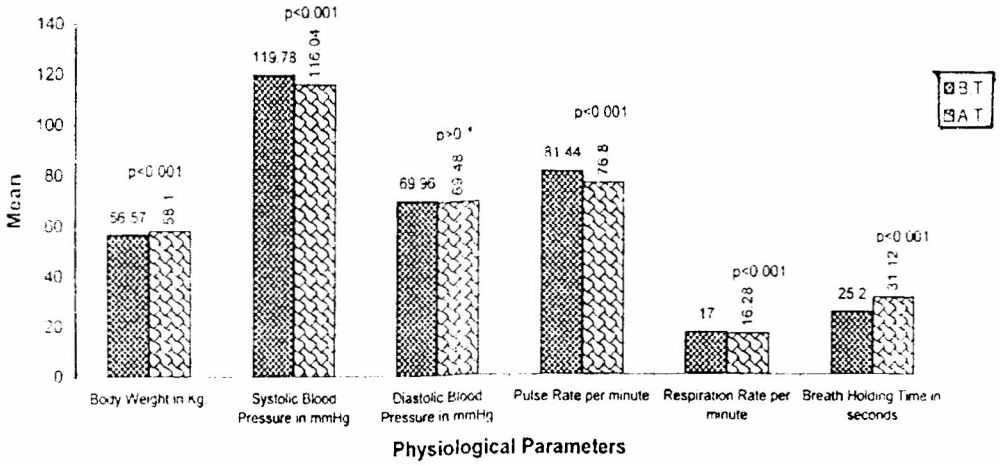


Figure No. 2: **Showing the pattern of Physiological Changes produced in 50 registered patients of stress after *Ashwagandha* Therapy**

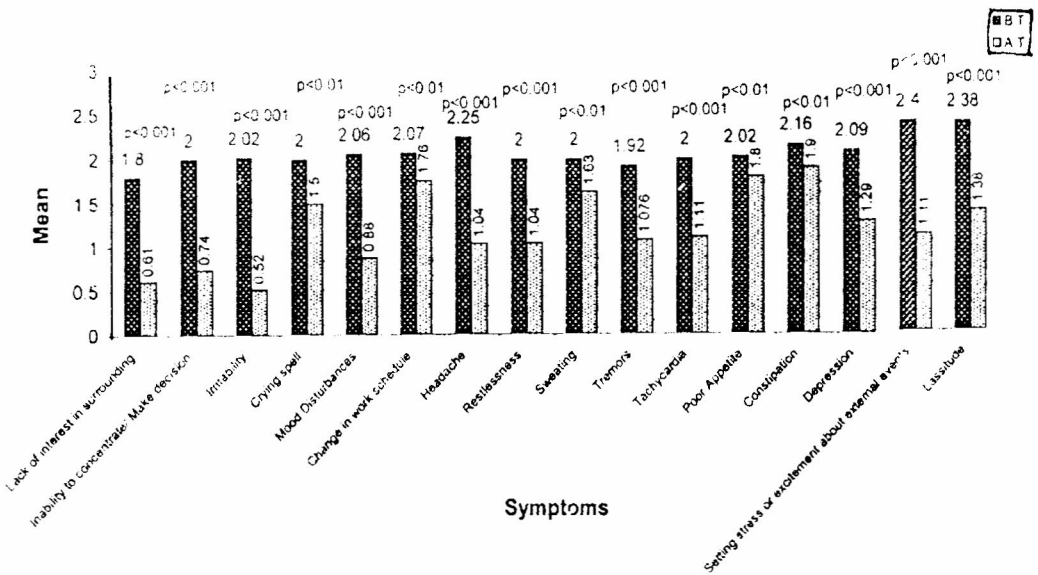


Figure No 3 : **Showing the pattern of Antistress Effect produced in 50 registered patients of stress after *Ashwagandha* Therapy**

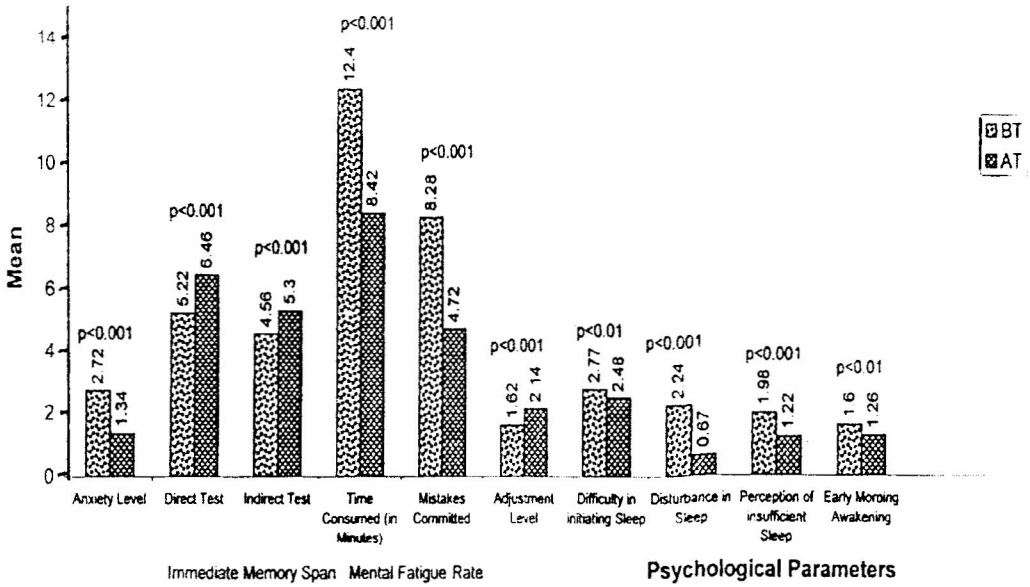


Figure No. 4 : **Showing the pattern of Psychological Changes produced in 50 registered patients of stress after *Ashwagandha* Therapy**

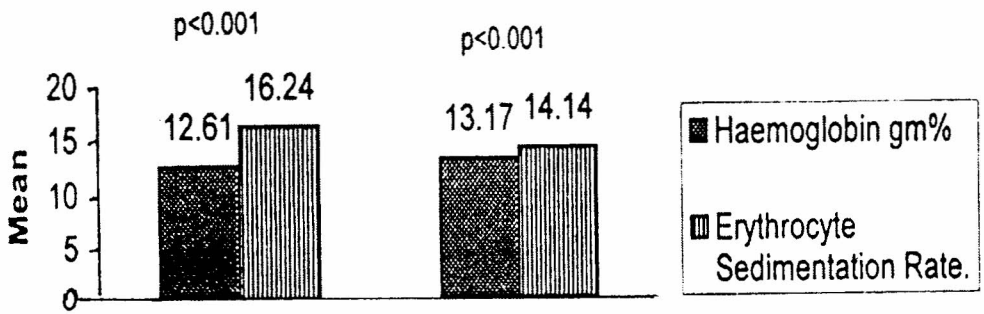
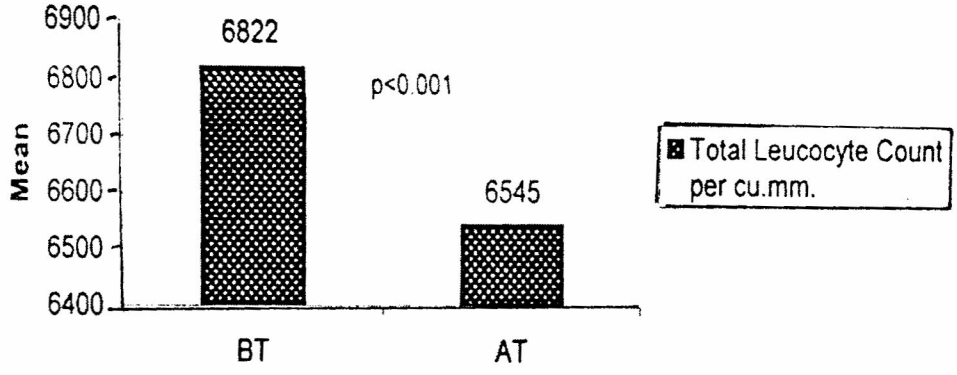
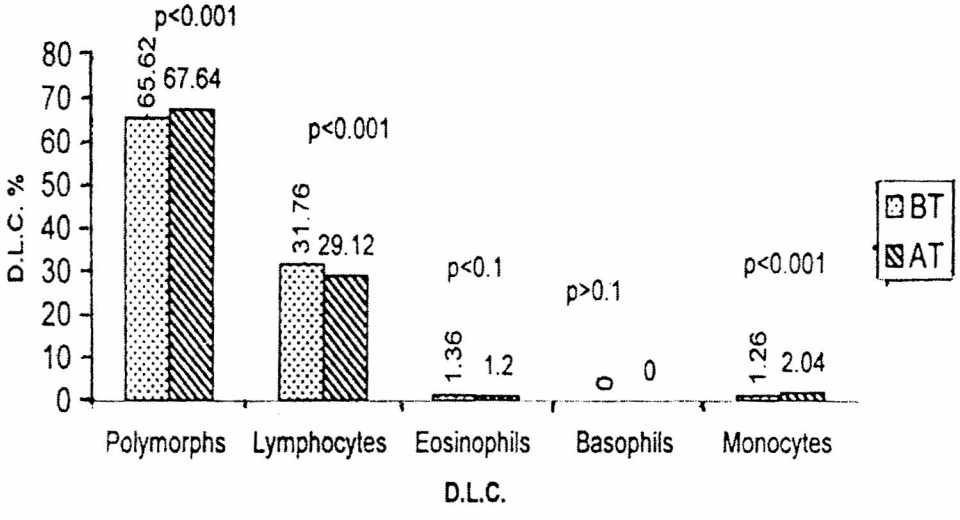


Figure No. 5: **Showing the pattern of Haematological Changes produced in 50 registered patients of stress after *Ashwagandha* Therapy**



Total Leucocyte Count per cu.mm.



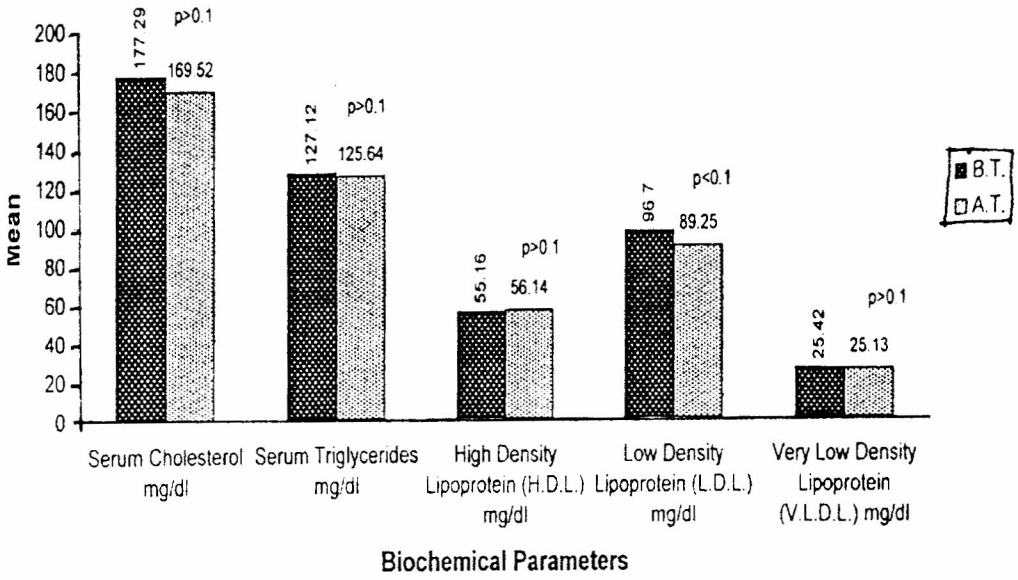


Figure No. 6: **Showing the pattern of Biochemical Changes produced in 50 registered patients of stress after *Ashwagandha* Therapy**

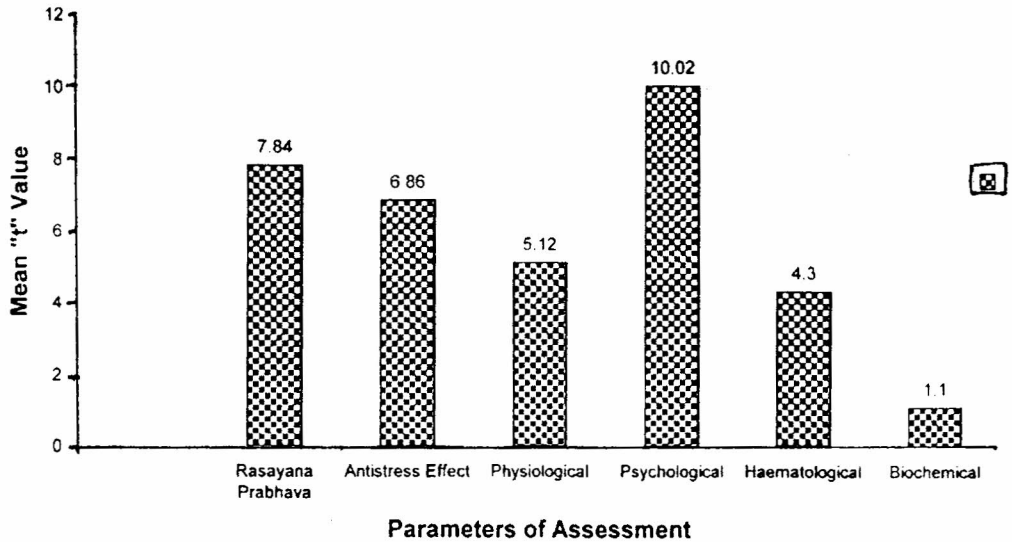


Figure No. 7 : Showing the overall improvement in different parameters of assessment in 50 registered patients of stress after *Ashwagandha* Therapy

Observations and Results

It was observed that the patients treated with *Ashwagandha* showed a significant improvement in the feeling of well being with improved mental and physical functions after the therapy confirming the *Rasayana* effect of *Ashwagandha.*

The *Rasayana Prabhava* of *Ashwagandha* was also worked out in terms of *Smriti Medha, Arogya, Prabha, Varna, Swara, Dehabala & Indriyabala.* All the patients have revealed highly significant improvement statistically in *Smriti* ($p<0.001$), *Arogya* ($p<o.00$) & *Dehabala* ($p<0.001$) and significant improvement in *Medha* ($p<0.001$) & *Prabha* ($p<0.01$) after the course of the therapy. On the other hand there was a trend of clinical improvement in *Varna* ($p<0.02$), *Swara* ($p<0.1$) & *Indriyabala* ($p<0.1$) after *Ashwagandha* therapy but it was statistically insignificant.

While assessing the antistress effect of *Ashwagandha, statistically highly* significant improvement was observed in the feeling of lack of interest in surroundings ($p<0.001$), inability to concentrate/make decision ($p<0.001$), irritability ($p<0.001$), mood disturbances ($p<0.001$), headache ($p<0.001$), restlessness ($p<0.001$), tremors ($p<0.001$), tachycardia ($p<0.001$), depression ($p<0.001$), setting stress or excitement about external events ($p<0.001$) & lassitude ($p<0.001$). Statistically significant improvement was noticed in the feeling of crying spell ($p<0.01$), change in work schedule ($p<0.01$), sweating ($p<0.01$), poor appetite ($p<0.01$) & constipation ($p<0.01$).

Rasayana Effects of *Ashwagandha* was also worked out in terms of various physiological parameters. The observations revealed that there was considerable improvement in Body Weight ($p<0.001$), Systolic Blood Pressure ($p<0.001$), Pulse Rate ($p<0.001$), Respiration Rate (p,0.001) & Breath Holding Time ($p<0.00$) after *Ashwagandha* therapy confirming the anabolic response i.e. *Rasayana Prabhava* of *Ashwagandha.* On the other hand, no significant improvement was noticed in Diastolic Blood Pressure ($p>0.1$) after the therapy.

The improvement in mental functions was observed in all registered patients in terms of certain psychological parameters. It is observed that there was highly significant reduction in Anxiety Level ($p<0.001$) suggesting a marked tranquility of mind produced after *Ashwagandha* therapy. Immediate Memory Span was noticed to be considerably improved in both the direct ($p<0.001$) & indirect ($p<0.001$) tests indicating a marked improvement in mental function of all the patients after *Ashwagandha* therapy. As regards the Mental Fatigue Rate there was marked reduction in both time consume ($p<0.001$) & mistakes committed

($p<0.001$), indicating a marked improvement in mental functions after the therapy. Adjustment Level was considerably improved ($p<0.001$) statistically. As regards the Sleep Pattern there was highly significant improvement in disturbance in sleep ($p<0.001$) & perception of insufficient sleep ($p<0.001$). On the other hand there was significant improvement in difficulty in initiating sleep ($p<0.001$) & early morning awakening ($p<0.01$) after the course of the therapy. The clinical & statistical improvement in all the psychological permeates after *Ashwagandha* therapy confirms the *Medhya* effect of *Rasayana* drug *Ashwagandha*.

The changes in Haematological parameters after *Ashwagandha* therapy revealed considerable increase in Hbgm% ($p<0.001$), decrease in E.S.R. level ($p<0.001$), considerable decrease in T.L.C. ($p<0.001$), increase in Polymorphs ($p<0.001$), and Monocytes ($p<0.001$), decrease in Lymphocytes ($p<0.001$). There were no significant changes in Eosinophils ($p<0.1$) & Basophils ($p<0.1$). These findings suggest the anabolic & immunomodulator effects of *Rasayana* Drug *Ashwagandha*.

Lipid profile could be done only in 20 patients. There were no significant changes in Serum Cholesterol ($p>0.1$), Serum Triglycerides ($p>.01$), Serum H.D.L. ($p>0.1$), Serum L.D.. ($p<0.1$) & Serum V.L.D.L. ($p>0.1$) after the Ashwagandha therapy.

Probable Mode of Action of *Rasayana* Drug *Ashwagandha*

A *Rasayana* drug may produce its beneficial effects in the body by acting through one or more of the following three modes of actions-

1. By enriching the nutritional value of *Rasa* & helping directly in the better nourishment of *Dhatus* in the body leading to the final *Rasayana* effects.
2. By improving the digestion, absorption & metabolism by acting at the level of *Agni*. This improved digestion, absorption & metabolism also ultimately leads to improved tissue nourishment.
3. Acting at the level of *Srotamsi* i.e. at the microcirculatory channels carrying nutrition to the tissues ultimately improving the tissue nourishment.

The drug *Ashwagandha* appears to influence the organisms partly on all the three levels as indicated above & thus it affords the *Rasayana* effects & is a good remedy for the treatment of stress because it produces the tranquility of mind.

Ashwagandha possess various pharmacodynamic properties, which include *Tikta, Kashaya & Madhura Rasa, Madhura Vipaka & Ushna Veerya, Laghu & Snigdhaguna, Rasayana, Vrishya, Balya,*

Vishaghna & Nidra Janana Prabhava. A drug with such pharmacodynamic properties is expected to improve quality of life, reduce the amount of stress, improve mental functions & improve physical strength of the individual. Being a *Rasayana* & immunomodulator drug *Ashwagandha* seems to strength the immune system of human body, there by proving to be potent antistress agent.

Conclusions

It can be concluded from the current research project that *Ashwagandha (Withania somnifera)* is a classical *Rasayana* drug, which can be used for improving the quality of life in terms of improved physical strength. It possesses potent anti-stress activity as it improves the mental faculties due to its psychotropic & tranquillizing effects over mind. It is a potent immunomodulator drug, which potentiates the immune system of human body.

Therefore it can be concluded that *Ashwagandha (Withania somnifera)* is a classical *Rasayana* Drug with potent antistress activities which can be used effectively as immunomodulator drug for improving the quality of life.

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हिन्दी सारांश

अश्वगन्धा *(Withania somnifera)* के रसायन एवं मानसिक तनावहर (एन्टीस्ट्रेस) प्रभाव का चिकित्सात्मक विश्लेषण– एक वैज्ञानिक अध्ययन

प्रो. अजय कुमार शर्मा एवं राजेश कुमार

आयुर्वेदीय ग्रन्थों में वर्णित अश्वगंधा *(Withania somnifera)* के रसायन एवं मानसिक तनावहर (एन्टीस्ट्रेस) प्रभाव के अध्ययन हेतु मानसिक तनावजन्य विकृति के 50 रोगियों को अश्वगंधा चूर्ण का प्रयोग तीन माह तक करवाया गया।

प्राप्त परिणामों का विश्लेषण करने पर यह निष्कर्ष प्राप्त हुआ कि अश्वगंधा द्वारा उपचारित रोगियों में रसायन एवं मानसिक तनाव से सम्बन्धित सभी लक्षणों में यथा स्मृति, मेधा, आरोग्य, प्रभा,वर्ण, स्वर, देहबल, इन्द्रियबल एवं मानसिक तनाव में चिकित्सोपरान्त सांख्यिकी दृष्टि से महत्वपूर्ण सुधार पाया गया।

अतः प्रस्तुत अध्ययन से यह सिद्ध होता है कि अश्वगंधा एक महत्वपूर्ण देह–मानस स्वास्थ्यवर्धक एवं संरक्षक, प्रमुख मानसिक तनावहर, मेधावर्धक, बल्य एवं व्याधि प्रतिरोधक रसायन द्रव्य है।