

## ASSESSMENT OF SHIRODHARA BY GSR (GALVANIC SKIN RESPONSE) BIOFEED BACK MACHINE W.S.R TO STRESS - A CLINICAL STUDY

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### ABSTRACT

Regarding 'stress', there is no direct reference available in Ayurveda texts. In Ayurveda, stress can be explained as a resultant condition due to *pragyaparadha*. In the present study total 96 patients of stress were registered and randomly divided into 2 groups viz: Group B patients were subjected to *Tailadhara* for 7 days along with *Mansyadi Kwatha* for 30 days; Group C received only *Mansyadi Kwatha* for 30 days. The main aims & objectives of the study are: 1) To study the clinical efficacy of *Shirodhara* in the management of Stress. 2) To study the clinical efficacy of *Mansyadi Kwatha* in the management of stress. Assessment of the effect of treatment was done on the basis of relief in the subjective & objective signs & symptoms of stress and specific examinations. The data were analyzed statistically. An analysis was also done with the help of GSR-bio feedback machine. Arousal changes, primarily due to sympathetic nervous system changes, are measured by the GSR, galvanic skin response. GSR measures changes in the sweat gland activity on the surface of the skin, usually the hand. It was observed that symptoms like insomnia, anxiety etc were almost completely relieved in *Shirodhara* group. *Shirodhara* provided better relief in symptoms of stress and statistically results are highly significant.

**KEY WORDS:** *Shirodhara*, GSR biofeedback, Stress, *Vaata*, *Pragnapradha*

### INTRODUCTION

According to the American academy of family physicians, the majority of all physician visits are prompted by stress-related symptoms that are known to cause or worsen medical conditions. [1]

The modern jet-age world, which is said to be a world of amazing achievements, is also a horrible world of stress. We find stress everywhere, whether it be within the family, business organization, enterprise or any other social or economic activity. Right from the time of birth till the last breath drawn; an individual is invariably exposed to various stressful situations. Thus, it is not surprising that interest in the issue has been raising in the present

century which can be appropriately called the "Era of Anxiety and stress" According to latest health reports, stress is said to be one of the largest killers of man today. Stress is now becoming more accepted as being crucially related to our total health - physical, mental and emotional. [2]

### DEFINITION OF STRESS:

The term "stress" is difficult to define and may mean different things to different people in divergent circumstances. The oldest definition is that of Hans Selye who defined stress as the "non-specific (i.e. common) result of any demand on the

body, whether the effect be mental or somatic"[3]

Regarding 'stress', there is no direct reference available in Ayurveda texts. In various available dictionaries, meaning of stress words are- *Aayaas* (Exertion), *Pratyabala* (Exerting more than your capacity), *Bhaar*(Pressure), *Prayatna* (effort), *Tanaav* (Tension), etc. [] Hence it is clear that only terminological clarification is available to some extent but not detailed description regarding stress. So a hypothesis can be formulated where stress is correlated with *Buddhi*, *Dhruti* and *Smriti Vibhramsha*, (impairment of intellect, impairment of will, impairment of memory) which ultimately leads to *Pragnaparadha* (intellectual error). *Pragnaparadha* (intellectual error) is mentioned as one of the causative factor for nearly all the diseases, especially mental diseases. Due to *Pragnaparadha*, a person is not able to perform his intellectual functions at its optimum level and fails to discriminate between right and wrong which results in numerous mental diseases. Stress is outcome of such conditions.

Approach of Ayurveda towards mental diseases always keeps uniqueness, as it does with all other diseases. In any disease changes in the basic constitution of the body, which are evolved from causes related to physical and mental functions, frame a morbid physiology. The routes of the diseases get embedded in the two inseparable aspects of the living being, the body and mind in varying proportions. It is the keynote for the mutual dependence of mind and body, through which Ayurveda developed its therapeutic basis.

The root cause of all these is, vitiation of bodily humors - *Vaata*, *Pitta*, and *Kapha*. Bodily humors though made of 5 elements are related with mind also. The normal

physiological functions of the bodily humors include many psychological functions. Thus *Vaata* is responsible for enthusiasm, *Pitta* is responsible for the activities of brain and generation of intelligence and *Kapha* is responsible for intelligence and will power etc.[5] of the three humors, *Vaata* is mainly responsible for the activities of the mind. It is controller and stimulator of mind. [6] [7]Coming to the divisions of *Vaata*, we find *Prana* is the supporter of the mental functions and *Udana* is responsible for the generation of memory [8] and amongst the types of *Pitta*, *Sadhaka Pitta* is directly related to the functions of mind.[9]

Changes in bodily humors affect the mind too. Vitiated bodily humors adversely affect the normal functioning of mind. Taking into consideration the above factors of *Vaata*, it is evident that *Vaata* is of prime important among humors. This is true in the case of mental disorders also. *Shirodhara* is one of the treatments which helps to control the function of mind and is therefore selected for the present study of stress where mind is mainly vitiated. *Shirodhara* is described under *Murdha Tail*.

*Murdha Tail - Shirahatarpana* (It belongs to the category of external application of oil and refers to applying the oil to the head. this is also known by the name *Shirahatarpana*) is suggested treatment for any disorders occurring in head region.[10] Vagbhata has divided *Murdha Tail* into 4 divisions and suggested as "*Uttarotara*" *Gunaprada* i.e., Sequentially more beneficial; they are 1) *Shiro - Abhayanga* (Application of the oil to the scalp followed by massage) (2) *Shira - Seka* (Procedure of pouring the medicated oil or other liquids on the forehead) (3) *Shira - Pichudharana* (A procedure in which cotton swab soaked in oil is placed on the vertex for certain

period. (4) *Shiro - Basti* (Certain amount of oil is poured on the vertex and is made to remain there for specific period).

*Mansyadi Kwatha* is given as a follow up drug after *Shirodhara*, as stress is a psychic disease which requires some drug treatment (internal) also. *Mansyadi Kwatha* is widely utilized in GAU Jamnagar for many psychic diseases, as it contains, *Ashwagandha* (*Withania Somnifera*), *Jatamansi* (*Nordostachys Jatamansi*) and *Khurasani Ajowain* (*Hyoscyamus Niger*). It is indicated for *Apasmara* (Epilepsy) & *Akshepa* (Convulsions) etc psychic conditions.

#### **IMPORTANCE OF PRESENT STUDY:**

Stresses being a crucial problem worldwide, various psychiatric medicines have come in to existence for its cure. But it leads to drug addiction, drug dependency and many physical and mental side effects. Such patients are always in search of better treatment with least side effects. *Shirodhara* is a treatment with better results and has no side effects at all. It is only external treatment. *Shirodhara* is described under *Snehana* (Oleation) treatment, but in the present world various drugs like decoction, water, butter milk etc are utilized for *Shirodhara*. So, here an effort is done to find out the comparative effect of *Shirodhara* in the management of stress.

#### **AIMS AND OBJECTIVES:**

- 1) To study the clinical efficacy of *Shirodhara* in the management of Stress.
- 2) To study the clinical efficacy of *Mansyadi Kwatha* in the management of stress.

#### **MATERIAL AND METHOD:**

##### **Clinical study:**

To evaluate the therapeutic effect of *Shirodhara* clinical study was undertaken.

##### **Study design:**

**Clinical study is planned to study the efficacy of Shirodhara treatment and Mansyadi kwatha in management of stress.**

**To assess the effect of Shirodhara GRS biofeed back machine is used which shows different reading during stress and relax state of body.**

##### **Criteria of selection:**

Patients with signs & symptoms of stress attending I.P.G.T. & R.A. hospital O.P.D & I.P.D. were selected irrespective of age, sex, occupation, religion, financial status etc.

##### **Criteria of exclusion**

Patients presenting with severe complications like schizophrenia, insane etc were not taken for the study.

##### **Investigations**

All the patients selected were subjected to routine investigations to rule out any complications.

- (1) Blood investigations: Hb, TC, DC, ESR, and PCV etc.
- (2) Urine investigations: routine & microscopic examination.
- (3) Stool investigations: routine & microscopic examination.
- (4) Biochemical examination.

##### **Grouping:**

The selected patients were randomly placed & studied under two groups.

Group B were subjected to *Shirodhara* (*Taildhara*) along with *Mansyadi Kwatha*.

Group C (standard control group) received only *Mansyadi Kwatha*.

##### **Drug, Dose & Duration**

##### **Drugs:**

Internal drug:-*Mansyadi Kwatha*

External drugs: For *Shirodhara*- sesame oil.

##### **Dose:**

*Mansyadi Kwatha* 20 ml B.D.

Approximately 3 Liters sesame oil for *Shirodhara*.

**Duration:**

The Duration was 7 Days for *Shirodhara* followed by *Mansyadi Kwatha* for 30 days in group B. In group C only *Mansyadi kwatha* was given for 30 days.

**Follow up study:** ONE-MONTH follow up study.

**Diet & Regimen:**

Patients under study were advised about diet & Regimen as indicated in the management of *Vaata Vriddhi* (Increase of *Vaata*).

**Criteria of Assessment:**

- Assessment of the effect of treatment was done on the basis of the relief in the
- Subjective & objective signs & symptoms of stress.

The data were analysed statistically -Mean, percentage relief, S.D; S.E, *t* and *p* values have been calculated.

- An analysis was also done with the help of GSR-bio feedback machine

- Almost all the symptoms of stress were studied under specific examination and following scoring pattern was adopted for each symptom.

Which statistical test has been applied in this study please clarify and mention the test name

SPECIFIC EXAMINATION: Each symptom was graded as follows

- Never 0
- Seldom +
- Sometimes ++
- Always +++

Perspiration: increased sweating or cold clammy hands, Frequent need to urinate, Voice change, Anxiety or panic: feeling things getting out of control, Hyperactivity: sudden bursts of energy, Difficulty falling asleep; insomnia, Fatigue, Neuromuscular dysfunction, etc

**OBSERVATIONS AND RESULTS:**

Total 96 patients were registered for the study of stress management. Distributions of patients were as follows:

**TABLE NO: 1**

Group	Completed	LAMA	Total Registered
B	38	06	44
C	43	09	52
	81	15	96

Total 96 patients were registered for the present study which was divided into 2 groups, total 15 patients left the treatment. 6patients in *Shirodhara* group (GP-B) and 9 patients in *Mansyadi Kwatha* group (GP-C).

Reason may be they could not come daily for *Shirodhara* and another was they

wanted a miraculous result in just one sitting of *Shirodhara*. Few patients who completed 7 days of *Dhara* did not complete the medicine course as they felt relieved with only *Shirodhara*.

**Demographic data:**

**TABLE NO: 2**

Data	%
Age- 31-45yrs	41.60
Sex- females	51.82
Religion- Hindu	91.24
Living arrangement- with family	90.51
Education- Graduate	32.11
Marital status- married	84.67

Occupation- house wife	43.06
Socio economic- middle class	39.41
Family history	27.73
Diet	87.59
Lavana rasa more	75.91
Shamshana	53.28
Poor quantity of food	78.83
Poor appetite	70.80
Urban area of residence	94.89
Not doing exercise	87.59
Disturbed sleep	89.05
Nightmares	39.41
5-6 hrs sleep	85.40
More than 6hrs of working	67.15
Moderate nature of work	51.82
Job satisfaction	54.01
Pallor	85.40
Nadi pariksha	71.53
Constipation	62.77
Normal urine frequency	90.51

TABLE NO: 3

Parameters	Maximum%
Sharira Prakruti- Vaata- Pitta Prakruti	72.26
Manas Prakruti- Rajasika Prakruti	70.80
Sara-Madhyam	87.59
Samhana-Madhyam	86.86
Satva-Avara	54.74
Satmya- Madhyam	92.70
Pramana-Madhyam	89.05
Vyayam- Madhyam	86.13
Desha- Jangama	93.43

**CAUSATIVE FACTORS:** The most common causative factors were change in social activities 83.94%, change in amount of recreation 78.10%, change in job responsibilities 65.68%, personal illness 62.77%, and change in eating habits 59.12% & change in sleeping habits 58.39%.

**SROTAS DUSHTI WISE (VITIATION OF CHANNELS):** Maximum *Sroto Dushti* is of *Rasavaha Srotas* found in 97.81% of patients & *Asthivaha Srotas* in 97.08% of patients followed by *Annavaha Srotas Dushti* in 95.62.

**CHIEF COMPLAINTS:** All the patients i.e. 100% had chief complaint of can't concentrate, than 97.81% had can't cope, 95.62% had always tired, 94.89% of patient had feel hopeless & helpless & trouble sleeping & 85.40% had depressed, 89.05% were uninterested in life in general.

Associated complains were mainly Gabharaman in 53.28%, negative thinking in 49.63%, chest pain in 33.57% and burning in chest in 37.22%.

TABLE NO: 4 EFFECT OF THERAPY ON SPECIFIC EXAMINATION:

Symptoms	Gp	n	mean	%	SD	SE	t	P
<b>Perspiration: Increased Sweating</b>	Gp B	15	1.53	71.83	0.64	0.17	8.97	<0.001
	Gp C	10	1.1	57.89	0.99	0.33	3.32	<0.01
<b>Cold &amp; calmy hands</b>	Gp B	16	0.75	46.01	0.77	0.2	3.75	<0.01
	Gp C	15	0.6	37.5	0.63	0.17	3.55	<0.01
<b>Frequent need to urinate</b>	Gp B	2	2.5	83.33	0.71	0.71	3.54	<0.05
	Gp C	3	1.67	71.24	1.15	0.82	2.04	<0.1
<b>Voice changes Low feeble</b>	Gp B	6	1	59.88	0.98	0.4	2.5	<0.01
	Gp C	6	1	59.88	0	0	0	-
<b>Anxiety</b>	Gp B	37	2.59	89.51	0.55	0.09	28.27	<0.001
	Gp C	43	1.81	62.85	0.76	0.12	15.39	<0.001
<b>Feeling things getting out of control</b>	Gp B	37	2.54	88.89	0.56	0.09	27.35	<0.001
	Gp C	43	2.05	70.83	0.62	0.09	21.55	<0.001
<b>Hyper activity</b>	Gp B	24	2.17	91.18	0.64	0.13	16.31	<0.001
	Gp C	19	1.32	69.31	0.75	0.18	7.45	<0.001
<b>Insomnia</b>	Gp B	38	2.87	96.23	0.41	0.07	12.87	<0.001
	Gp C	43	1.37	47.57	0.69	0.11	11.09	<0.001
<b>Nightmare</b>	Gp B	19	2.89	96.33	0.32	0.07	38.95	<0.001
	Gp C	15	1.67	58.19	0.62	0.16	10.10	<0.001
<b>Fatigue</b>	Gp B	35	1.71	86.6	0.46	0.08	21.81	<0.001
	Gp C	39	1.67	82.27	0.53	0.08	19.39	<0.001
<b>Impulsive be- haviour</b>	Gp B	10	1.7	80.95	0.48	0.16	10.55	<0.001
	Gp C	13	1.23	69.49	0.73	0.21	5.88	<0.001
<b>Indecisiveness</b>	Gp B	30	1.6	81.97	0.56	0.10	15.30	<0.001
	Gp C	38	1.11	62.5	0.61	0.10	11.10	<0.001

**TABLE NO: 5 EFFECT OF THERAPY ON SPECIFIC EXAMINATION:**

<b>Indigestion</b>	<b>Gp B</b>	<b>28</b>	<b>2.79</b>	<b>100</b>	<b>0.57</b>	<b>0.11</b>	<b>25.48</b>	<b>&lt;0.001</b>
	Gp C	29	2.38	88.47	0.68	0.13	18.6	<0.001
<b>Constipation</b>	Gp B	26	2.96	100	0.19	0.04	75.50	<0.001
	Gp C	30	2.5	91.51	0.51	0.11	23.52	<0.001
<b>Pain in neck &amp; shoulder</b>	Gp B	4	1.25	62.50	0.5	0.29	4.33	<0.01
	Gp C	7	1.43	64.5	0.79	0.32	4.45	<0.01
<b>Pain in back</b>	Gp B	17	1.41	72.68	0.51	0.13	11.13	<0.001
	Gp C	21	1.14	62.98	0.65	0.15	7.81	<0.001
<b>Self con- scious feel- ing of guilt</b>	Gp B	32	1.78	84.04	0.55	0.10	17.94	<0.001
	Gp C	41	1.15	61.62	0.73	0.11	9.98	<0.001
<b>Mental con- fusion</b>	Gp B	36	1.72	80.37	0.57	0.11	17.99	<0.001
	Gp C	43	1.30	66.66	0.60	0.09	14.09	<0.001
<b>Poor judgement</b>	Gp B	36	1.72	80.09	0.51	0.09	19.84	<0.001
	Gp C	43	1.28	64.62	0.59	0.09	14.03	<0.001

<b>Poor mem-ory</b>	Gp B	36	1.72	80.09	0.51	0.09	19.84	<0.001
	Gp C	41	1.15	61.62	0.61	0.10	11.79	<0.001
<b>Menstrual difficulties PMS</b>	Gp B	13	1.23	59.13	0.44	0.13	9.72	<0.001
	Gp C	19	1.05	46.46	0.52	0.12	8.52	<0.001
<b>Chest pain</b>	Gp B	26	1.35	85.80	0.49	0.10	13.87	<0.001
	Gp C	20	1.15	85.19	0.49	0.11	10.24	<0.001
<b>Tension headache</b>	Gp B	37	2.81	97.23	0.40	0.07	42.47	<0.001
	Gp C	43	1.60	55.68	0.62	0.10	16.70	<0.001
<b>Pessimistic attitude</b>	Gp B	36	2.03	86.36	0.70	0.12	17.22	<0.001
	Gp C	42	1.64	59.14	0.58	0.09	18.24	<0.001
<b>Feeling de-pressive, helpless &amp; hopeless</b>	Gp B	36	2.5	88.34	0.61	0.10	24.27	<0.001
	Gp C	41	1.83	74.70	0.73	0.11	16.13	<0.001
<b>Urge to cry, run &amp; hide</b>	Gp B	36	2.5	88.34	0.61	0.10	24.27	<0.001
	Gp C	29	1.79	74.27	0.77	0.15	12.26	<0.001
<b>Loss of ap-petite</b>	Gp B	30	1.77	86.70	0.68	0.13	14.01	<0.001
	Gp C	36	1.36	75.69	0.49	0.08	16.53	<0.001

In almost all the symptoms of specific examinations better results are obtained in Shirodhara group. Statistically result is highly significant at  $p < 0.001$ .

**TABLE NO: 6 OVER ALL EFFECT OF SHIRODHARA MEASURED BY GSR BIOFEED BACK MACHINE:**

<b>Mean in K-Ohm</b>							
<b>Initial</b>	<b>After 45 mins of Dhara</b>	<b>Mean</b>	<b>%</b>	<b>SD</b>	<b>SE</b>	<b>T</b>	<b>P</b>
<b>920.54</b>	1539.82	619.80	40.25	150.48	50.16	12.36	<0.001

After completion of *Shirodhara* for 45 minutes the overall relaxation effect is obtained which is measured by GSR Biofeed back machine. Statistically result is highly significant at  $p < 0.001$ .

**EFFECT OF THERAPIES ON CHIEF COMPLAINTS:  
TABLE NO: 7  
COMPARATIVE DATA OF % WISE RELIEF IN BOTH THE GROUPS:**

<b>Chief complaints</b>	<b>Group- B</b>	<b>Group- C</b>
<b>Can't cope</b>	84.29	61.62
<b>Can't concentrate</b>	83.33	57.99
<b>Feel hopeless &amp; helpless</b>	86.36	59.14
<b>Depressed</b>	88.34	74.70
<b>Always tired</b>	86.60	82.27
<b>Often irritable &amp; angry</b>	83.45	75.66
<b>Eat too much</b>	50	66.67
<b>Eat too little</b>	86.70	75.69
<b>Trouble sleeping</b>	96.23	47.57
<b>Frequent headache</b>	97.23	55.68
<b>Frequent backache</b>	72.68	62.98
<b>Frequent pain in legs</b>	75	62.50

No time to talk to friends & family	63.64	70
Not interested in sex	85.71	57.80
Always sick get cough & cold & other viral infection	66.67	84.72
Allergies	00	40
Skin rashes	54.55	50.22
IBS	100	78.57
Hyper gastritis	100	93.41
Constipation	100	91.51
Not interested in life in general	80.09	64.62

TABLE NO: 8 ASSESSMENT OF SHIRODHARA:

Samayaka Shirodhara Lakshana(Symptoms of properly performed Shirodhara)	Group-B	%
<i>Sthairya Vaaga</i> (Stability of speech)	14	36.84
<i>Sthairya Mana</i> (Stability of Mind)	35	92.1
<i>Sthairya Sharirabala</i> (Enhances the physical stamina)	36	94.73
<i>Ahara Akanksha</i> (Promotes appetite)	35	92.1
<i>Dhriti</i> (Promotes intellect)	34	89.47
<i>Vaani Madhura</i> (Promotes sweetness of voice)	23	60.52
<i>Netra Prakasha Agadaha</i> (Improves the eye sight)	36	94.73
<i>Tvacha Mruduta</i> (Promotes smoothness of skin)	07	18.42
<i>Shukra Asrigapariposhanam</i> (Nourishes the body tissues)	36	94.73
<i>Rat Rati</i> (Promotes sexual function)	10	26.31
<i>Alpa Ushana</i> (Decreases the body temperature)	06	15.78

In Shirodhara group 94.73 % of patient had *Sthairya Sharira Bala*, *Netra Prakasha Agadaha* *Shukra Asrigapariposhanam*,

and 92.10% of patient had *Sthairya Mana*, *Ahara Akanksha*.

TABLE NO: 9 TOTAL EFFECT OF THERAPY:

	Gp B	%	Gp C	%
Complete remission	00	00	00	00
Marked improvement	25	65.79	14	32.56
Moderate improvement	10	26.32	18	41.86
Improved	03	7.89	11	25.58
Unchanged	00	00	00	00

TABLE NO 10 : TOTAL EFFECT OF THERAPY IN RECURRENCE:

Recurrence	Gp B	%	Gp C	%
Present	01	2.63	09	20.93
Absent	37	97.37	34	79.07

Recurrence was obtained in 20.93% in *Mansyadi Kwatha* Group. While only 2.63 % of recurrence is obtained in *Shirodhara* group.

## DISCUSSION

### Galvanic Skin Response (GSR) Biofeedback:

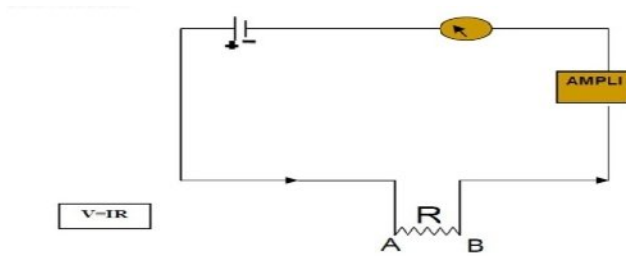
Arousal changes, primarily due to sympathetic nervous system changes, are



measure by the GSR, galvanic skin response. GSR measures changes in the sweat gland activity on the surface of the

skin, usually the hand.

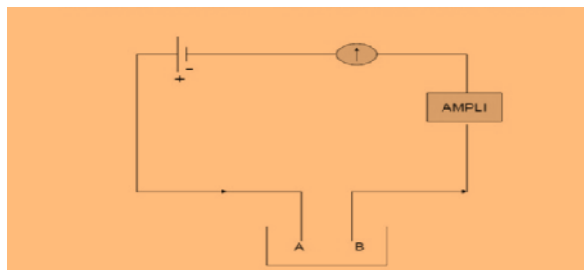
**Figure no 1 CLOSE CIRCUITS**



This is a common circuit diagram of Ohm's law which we all have learned in our school. Where  $V = 'IR'$  ( $V =$  voltage,  $I =$  current,  $R =$  resistant) flow of current is always from anode towards the cathode. A and B are the points of resistance 'R' and for measuring the amplitude of current a galvanometer is placed. So whenever a current passes through point A and B of the resistance, depending upon the resistance 'R', the amount of current

'I' passes. Its magnitude is amplified at the amplifier and measured in Reading scale / meter through galvanometer. Here  $I = V/R$  i.e., current is inversely proportion to resistance i.e. high resistance low current, low resistance high current.

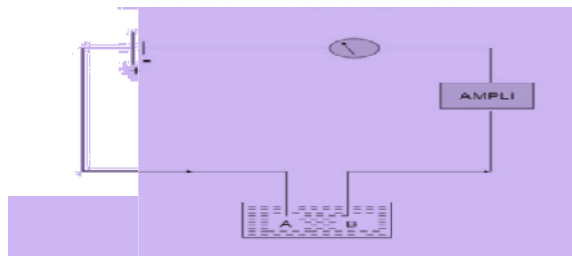
**Figure no 2 BREAK IN CLOSE CIRCUIT**



In this circuit diagram we see that there is no connection between point A and B so no current passes between them so the reading is shown to zero in the scale.

**CIRCUITS**

**Figure no 3 CLOSE**



Now suppose if we add any media between point A and

B, depending upon the resistance of that media the amount of current will flow form point A to B. for

an e.g. Air - bad conductor, water - poor conductor, salt solution - better conductor, metal - best conductor.

**MEASUREMENT OF STRESS IN GSR:**

The point A and B shown in the previous diagram are our two electrodes in GSR machine, which we wrap around the patient's figure. Skin on the surface of finger comes in contact with electrode. Skin is the connecting media (i.e., resistance) between these two points. Now during stress condition much amount of sweat is released, GSR measures this sweat gland activity during the process of *Shirodhara*. This Biofeed back machine is just helpful in knowing the status of a person at different times of day. Here we are measuring only during the *Shirodhara* process. Sweat

is good conductor, so when a person is der stress, sweat gland activity increases, due to sympathetic stimulation.

Two types of sweat gland are there are the body 1) Eccrine glands 2) Apocrine glands.

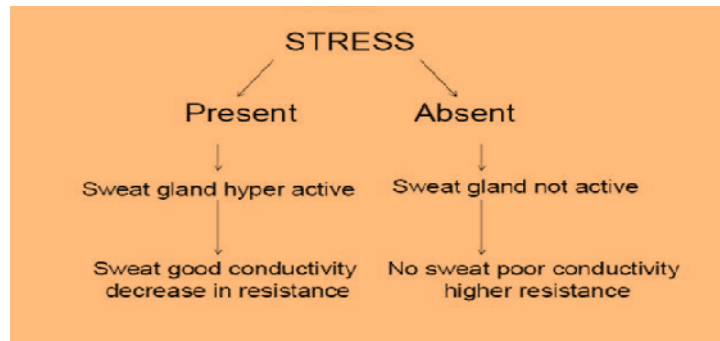
**Eccrine sweat glands:**

Its distribution is all over body except axilla, pubic, palm and soles, during stress condition eccrine gland activity decreases, cutaneous blood flow decreases and muscle blood flow increases.

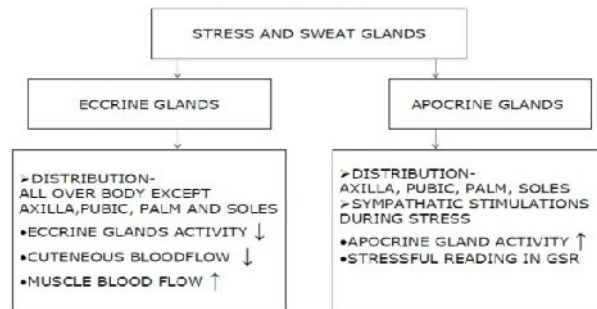
**Apocrine sweat glands:**

Its distribution is in axilla, public, palm, soles, sympathetic stimulations during stress increases apocrine gland activity.

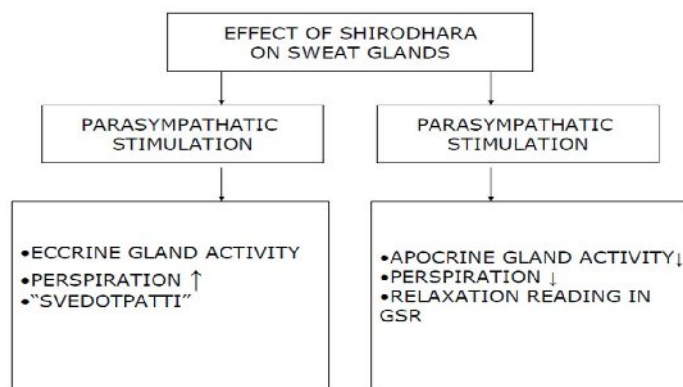
**Figure No 4: MEASUREMENT OF STRESS IN GSR**



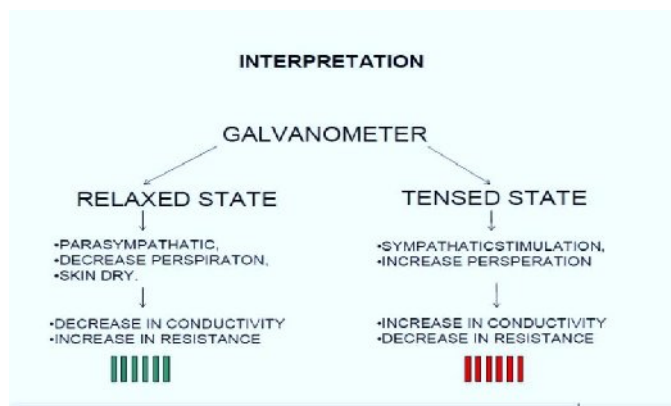
**Figure no 5: EFFECT ON SWEAT GLANDS**



**Figure no 6 EFFECT OF SHIRODHARA ON SWEAT GLANDS**



**Figure No 7: INTERPRETATION**



Sympathetic stimulation also causes vasoconstriction of the blood vessels that supply the glands and in this way often reduces their rates of secretion.

GSR is effective in the treatment of phobias, anxiety, stuttering, diagnosis and demonstration of mind body interaction etc. In this way, GSR measures your level of arousal, which means that it can sense the level of relaxation or tension in your body and mind. It is highly sensitive to emotions and it has been used in the stress induced disorders.

During *Shirodhara* procedure patient is devoid of surroundings, which helps him to calm the stressful mind. As the patient concentrates on particular place, the thought process decreases and thus entire physiology reverses.

**MODE OF ACTION OF DRUG:**

*Mansyadi kwatha*: *Bhutaghna prabhava* ( Specific effect on micro organisms) of *Jatamansi* & *Maadak prabhava* (which calms the mind) of *Khurasini ajwoin* corrects the vitiation of *Maanas dosha* ( *Raja* & *Tama*- bio humors of mind)by penetrating into *Manovaha srotas* (Minute channels of mind). *Medhya* ( promotes the intellect) & *Nidrajana* (the one which induces sleep) property of *Jatamansi Rasayana* (Rejuvenation) & *Balya* ( promotes the physical and mental strength) property of *Ashwagandha* corrects all *Maanas vikara* (corrects all mental diseases). *Tridosha shamaka* (sub sides all the 3 increased bio humors) property of *Jatamansi* & *kapha vaata shamaka* (decreases the biohumor *kapha* & *vaata*) prop-

erty of *Ashwagandha* corrects all the somatic ailments.

### Research into the Effects of *Shirodhara* on the Mind

According to Ayurveda, the function of the mind and nerves is dependent upon *Vayu or Vaata*. The complicated pharmaco-physio-psychologic action of *Shirodhara* may provide a useful model for future pharmaco-physio-psychotherapy.

The neurophysiological mechanism of the effects of *Shirodhara* on the psychophysiological changes may be related to the tactile stimulation of the skin or hair follicles innervated by the first branch of the trigeminal nerves (ophthalmic nerve). The impulses would be transmitted to the thalamus through the principal nucleus and forward to the cerebral cortex (somato-sensory field) or limbic system. [11] While most Ayurvedic therapies have their impact on the physical and energy sheaths of the subtle body system, *Shirodhara* most effectively purifies the mental sheath, where patterns of behavior and emotional traumas can distract the mind from its' role in supporting good health and spiritual growth. During *shirodhara* when patient is taken into a deep, meditative state of silence, the basal metabolic rate is significantly lowered, and with successive treatment, it is lowered even more.

In this state the body experiences itself more profoundly as a unified field of consciousness rather than thousands of physical parts. In this procedure the metabolic rate drops, and the brain waves become slow and coherent. The state of calm achieved with *Shirodhara* is unparalleled by other relaxation techniques, and it brings the nervous system into the depths of inner silence. In this deep stillness the

nervous system becomes aware of any stress or strain that inhibits the flow of stillness into every cell of the body. The goal is to have this pure experience of consciousness in every cell of the body – moving pure consciousness from the bliss sheath (Mind) to the physical sheath (Body). Once the mental sheath is cleared, the individual mind can choose, without distraction, to move into the bliss sheath or *Aandamaya kosha*. As one can see, if the subtle bodies, *Doshas*(biohumors), *Vayu* (*vaata* biohumor), *Nadis* (channels), *Chakras*(sites of energy), and *Srotas* (channels) are blocked, then physical imbalance, emotional disturbance, and mental unrest will be the accepted human condition (which it is in our current society). [12] A standardized *Shirodhara* leads to a state of alert calmness similar to the relaxation response observed in meditation. The clinical benefits observed with *Shirodhara* in anxiety neurosis, hypertension, and stress aggravation due to chronic degenerative diseases could be mediated through these adaptive physiological effects. A total feeling of wellness, mental clarity, and comprehension is experienced in this process. [13] *Shirodhara* stimulates the pineal gland which produces the hormone melatonin. Melatonin regulates the wake and sleep cycles of the body. [14] In the procedure of *Shirodhara*, a particular pressure and vibration is created over the forehead. The vibration is amplified by the hollow sinus present in the frontal bone. The vibration is then transmitted inwards through the fluid medium of cerebrospinal fluid (CSF). This vibration along with little temperature may activate the functions of thalamus and the basal forebrain which then brings the amount of serotonin and catecholamine to the normal stage inducing the sleep. The

process of *Shirodhara* also produces a meditation effect which helps to overcome the complaint of insomnia.

## CONCLUSION

Main causative factor as per Ayurveda is *Pragnapradha* (intellectual error)& main *Manas Dosha* (biohumor of mind) involved is *Raja. Sharirika Dosha* (biohumor of body) are mainly: *Vaata – Prana, Udana & Vyana* (various types of vaata biohumor classified on the basis of their site in the body and their function), *Pitta – Sadhaka* (type of pitta biohumor mainly related with function of mind), *Dushaya* (anything which is vitiated through biohumor)- *Mana* (mind) and all *Dhatus* (tissues). *Rasavaha, Raktavaha, Asthivaha* and *Swedavaha* are main *Srotas* (channels of nutritional fluids, channels of blood, channels of bones and channels of perspiration are mainly vitiated) involved in the disease stress.

For any disease occurring in head region *Vaata* is main *Dosha* (biohumor) as it is controller of mind. For *Vaata Shamana* (to pacify vaata biohumor) oil is considered to be best. Therefore one can find best results of *Shirodhara* compared to oral drug. *Shirodhara* has calming effect on mind which is similar to meditation thereby decreasing the stress level in human body.

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