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Concept of Shrama, Shramaharaw.s.r to Adaptogenic Activity in stress induced fatigue. A Review

Dr.Keerthana N [1], Dr.Suma V. Mallya[2].
[1]*Assistant professor, Dept. of PG Studies in Dravyaguna, SDM College of Ayurveda and Hospital, Hassan*
[2]*Associate professor, Dept. of PG and PhD Studies in Dravyaguna, SDM College of Ayurveda udupi*

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ABSTRACT
The concept of Shrama, Shramahara are explained in our ancient ayurvedic texts.Shrama means fatigue andShramahara means relieved from fatigue. These two concepts can be correlated modern fatigue and adaptogenic activity in stress induced fatigue. . Present generation people are suffering from stress and this stress is resulting in fatigue.Stress is an unpleasant reality of this century, due to alien environments and work setting beyond a certain threshold limit, competitive, high expectation life style results into decreased physical and mental work performance Stress induced fatigue is most common among people with or without disease. Here made an attempt to collect, analyse and review these concepts. The present article discusses the Shrama, Shramahara, stress induced fatigue and adaptogenic activity.
Keywords: shrama, shramahara, adaptogenic activity, stress induced fatigue.

I. INTRODUCTION

An ancient Ayurveda scholars have explained shrama under nidana and roopa of diseases. The concept of shramahara also explained and various methods to achieve it.
According to Shabdakalpadruma, (lexicon) Shrama can be termed as fatigue, tired, exhausted, whereas; Hara- destroying, removing.
Thus, Shramaharameans relieve from fatigue or exhaustion. These are also correlated as adaptogens as per recent literature.
Adaptogens are nontoxic substance which increases nonspecific resistance to stress related to physical as well as mental by increasing its ability to adapt and survive in stress [1].
Fatigue may be also because of certain physical activity or physiological phenomenon that appears with physical stress or exhaustive exercise which reduces the physical endurance capacity.
The drug which helps body in adopting to these stressor are known as Adptogens as previously mentioned.
Adaptogens of herbal origin are gaining a lot of interest globally because of their holistic and natural healing approach.
Few Adaptogenic plants have been used in traditional medicine like Ayurveda, Siddha, Unani since centuries to promote body defense mechanism. Hence with this background an attempt has been made to study.
The prime objective of the study is to explore whether this Shramahradashemani can be effective as Adaptogens in stress induced fatigue. This research study will give herbal source Adaptogens.

Objectives
To review the concept of Shrama, Shramahara and Adaptogens this paper contains following headings

- Literary study
- Discussion
- Conclusion

II. MATERIAL AND METHODS

Comprehensive review of the ingredients of Shramaharamahakashaya has been done using vruhattraya and Nighantus in e- nighantus. Published scientific works allied with ingredients have been reviewed. Further, compiled data was tabulated upon the properties (dravyaswalakshana), and analyzed the inference action (anumana) and logical therapeutic (yukti) outcomes pertinent to the concept of adaptogenic activity.

Derivation - श्रम+घञ्| तप: खेद: इतत श्रमधात्वार्थदर्शनात् (ए.क.द्र ५/१४)
Any physical action

Synonyms – (According to hemachandra)
1.क्लम: - यह अनायास: श्रमो ....
2.क्लेर: - द ○: ख
3.परिश्रम: - परित: श्रम
5.व्यायाम: - [illegible] आयासजन्य कमथ:

In Purana

- According to shivapuranathe word Shrama refers to exhaustion.
- According to VishnupuranaShrama is son of Aapa. (One of astavasu)

Samhitha and Nighantus

According to Shabdakalpadruma, (lexicon) Shrama can be termed as fatigue, tired, exhausted. Concept of Shrama in ayurveda means feeling of tiredness or exhaustion. It is a subjective symptom which is present after excessive work/exercise or with pathological condition in form of Nidana (Etiology) Purvarupa (Prodermal Symptoms), Rupa (Clinical Features).
Shrama is present as purvarupa in jwara (fever), pandu (anaemia).

As Rupa, shrama may occur in vatajajwara (type of fever), Rasa kshaya ,Pipasanigrahana, Medavrudhietc. Shrama occurs due to imbalance of Vatadosha. It is considered as one of AsheetiNanatmajaVatavikara Presently, the infinite dimensions of this concept had spread towards sports medicines with intentions for increasing shareerabala and exercise capacities Hence the concept of shrama can be explained through the theory of fatigue after analysing various concepts and theories regarding shrama in different ancient text.

Concept of fatigue in Biomedicine

Fatigue is one of most common symptoms of various diseases. It is subjective feeling of tiredness that has a gradual onset. Although often fatigue is self-limiting and frequently associated with psychosocial stress but also it is often uncertain regarding a serious cause and requires appropriate diagnostic work-up. Sometimes this symptom present previous to diseases. Sometimes it may occur after silent bacterial infection. It can be acute (less than 6 week) or chronic (more than 6 week). The prevalence rates for fatigue range from 7% to 42% and is probably because there is no agreed definition upon what comprises a fatigue case [Lewis and Wessely 1992]. In a community survey of women in India, 12% reported chronic fatigue.

Most common cause of Fatigue • Anaemia • Nutrition: Obesity, malnutrition, vitamin deficiency • Pregnancy • Infection: HIV, Malaria, hepatitis • Drugs-many medication, drug use, withdrawal, chronic alcohol • Endocrine disorders-hypothyroidism, hyperthyroidism, adrenal insufficiency, diabetes mellitus, hypercalcemia etc. • Sleep disorders: insomnia, restless leg syndrome • Neurological disease: multiple sclerosis, dementia Psychiatric disease • CLD/CKD • COPD/CHF • Autoimmune diseases: RA, Polymyalgia rheumatica • Disorder of unclear cause Chronic fatigue syndrome

Shramahara

The word Shramahara is combination of Shrama and hara. Shrama means feeling of exhaust so can be used for fatigue. Another word Hara-destroying, removing. Hence Shramahara word refers to antifatigue action. Thus, Shramaharadravyas are one which relieve from fatigue or exhaustion. These are also correlated as adaptogens as per recent literature.

Fatigue may be also because of certain physical activity or physiological phenomenon that appears with physical stress or exhaustive exercise which reduces the physical endurance capacity.

- Antifatigue; enhances mental acuity and physical endurance, work, and exercise capacity without the let-down that comes with stimulants such as caffeine products.

Shrama and its' relation with diseases as an etiological factor

1 Fever Su.U.39/80 C.Ni.1/220
2 Pittajaprameha (metabolic disorder due to vitiated pitta dosha) Ca.Ni.4/ 24
3 Skin disorders Ca.Ni.5l6
4 cause of discharge of pseudo pregnancy Ca.Vi.3/24
5 male infertility Ca.Ci.30/161
6 bhagandara (ano-rectal fistula) Su.Ni 4/9
7 palityaroga (alopecia) A.Hr.U.23/29
8 Shrama causes thirst Su.U.48/4

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Shrama and its' relation with diseases as a symptom or sign of a disease

1 Trishnanigrahana Suppression of thirst Ca.Su7/21
2 Vyayama excessive exercise Ca.Su.7/33
3 shrama is an indicative factor for purification therapy Ca.Su.15/14
4 Asthidhatukshaya(disorders of musculoskeletal system) majjadhatukshaya Ca.Su17/67 5 shukradhatukshaya(disorders of testosterone synthesis) Ca.Su.17l69 6
6 Rasa dhatukshaya(Depletion of rasa dhatu) A.Hr. Su. 11/17
7 prodromal and general symptom of fever Ca.Ni.1/33
8 symptom of skin disorders, pandu(malnutrition disorder), madatya(alcoholism) Ca.Ci.7/12 Ca.Ci.16/13 Ca.Ci.24/102
9 stage of loss of body strength sthaulya(obesity) A.Hr. Su.11/10
10 fever due to vitiation of vatadosha Ca.Ni.1/21
11 mamsamedhogatavata A.Hr.Ni.15/11
12 Ojovisramsa Su.Su.15/25

ADAPTOGENS

History

The concept of Adaptogens were originally created in 1947 to describe a substance that may increase resistance to stress. [2] During the period 1950–60, the idea of using herbal medicinal plants to increase stamina and survival in harmful environment was developed, and a new concept of "Adaptogens" was introduced by the toxicologist Lazarev to describe compounds which could increase "the state of non-specific resistance" in stress. This concept was based on Hans Selye's theory of stress and general adaptation syndrome, which have three phases: alarm phase, phase of resistance and phase of exhaustion [3], At the end of the 1960s Brekhman and Dardimov proposed that Adaptogens are innocuous agents, nonspecifically increasing resistance against physically, chemically, biologically and psychologically noxious factors ("stressors"), normalizing effect independent of the nature of pathologic state [4]. In the early 1960's, the study of adaptogens developed into a field of biomedicinal research in its own right in the USSR. This was due to a major targeted project or direction of research, such as mapping or screening of biologically active substances from the plant kingdom. The aim of the stress research was to develop drugs and methods able to stimulate the intrinsic adaptive mechanisms of the organism to help it survive in situations of intense or prolonged stress, whilst preferably maintaining the capability for physical and mental work [5]. The extent of the research carried out was enormous with 1009 studies (primarily pharmacological and clinical) published in Russia up until 1982 and most of them concerned extracts or isolates prepared from Eleutherococcussenticosus[6] 7 Adaptogenic substances are stated to have the capacity to normalize body functions and strengthen systems compromised by stress. They are reported to have a protective effect on health against a wide variety of environmental assaults and emotional conditions. Different Definitions of Adaptogens. Adaptogens are nontoxic substance which increases nonspecific resistance to stress related to physical as well as mental by increasing its ability to adapt and survive in stress [7]. Stress is an unpleasant reality of this century, due to alien environments and work setting beyond a certain threshold limit, competitive, high expectation life style results into decreased physical and mental work performance. As a pharmacotherapeutic group adaptogens were recently defined as herbal preparations that increased attention and endurance in fatigue, and reduced stress-induced impairments and disorders related to the neuro-endocrine and immune systems [8, 9]. This definition was based on evidence obtained from clinical trials, which we evaluated in accordance with the European Medicines Agency Assessment Scale [10] and US Natural Standards Evidence–based Validated Grading Rationale [11] The general pharmacodynamic characteristics of an adaptogenic substance were defined by Brekhman 1968a, 1969b) as follows: [12]

a) anadaptogen is almost non-toxic to the recipient;
b) an adaptogen tends to be non-specific in its pharmacological properties and acts by increasing the resistance of the organism to a broad spectrum of adverse biological, chemical, and physical factors;
c) anadaptogen tends to be a regulator having a normalizing effect on the various organ systems of the recipient organism;
d) the effect of an adaptogen is as pronounced as deeper are pathologic changes in the organism. (hmpc) The term adaptogen is often applied to plants, even when the criteria of an adaptogen is not met with, such as the important and significant general adaptive effect on stress involving the whole organism and its main organ and functions. Pharmacological studies in connection with the term adaptogen

The earliest studies of adaptogens investigated primarily their ability to increase the mental and physical working capacity in humans

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(Medvedev, 1963; Dalinger, 1966a). After those studies characteristic differences between the effects of adaptogens and those of CNS stimulants became evident (Fulder, 1980 in Panossian 2005).

CNS Stimulant &Adaptogens

Stimulants that increase the activity of the sympathetic nervous system, may produce a sense of euphoria and may be used to increase alertness and the ability to concentrate on mental tasks. Plant 8 adaptogens are reported to stimulate the nervous system by mechanisms that are claimed to be different from those of stimulants, being associated rather by metabolic regulation of various elements of the stress-system and modulation of stimulus-response coupling (Wagner, 1994; Panossian, 1999; Panossian, 2003).

Immunostimulant &Adaptogens

Adaptogens are reputed to have an anti-stress effect mainly towards stresses of a non-infectious agent. In this aspect adaptogens differ from immunostimulants. The general purpose of adaptogens is the reduction of stress reactions in the alarm phase, thereby avoiding the exhaustion stage and providing a certain protection against stress. In a similar way, Brekhman (1980) describes the adaptogenic effect as a strengthening of the physiological adaptation. In addition to their various properties, adaptogens are thought to rebuild strength of the body after stress or fatigue (Baranov, 1982). Clinical trials on adaptogens reported an effective application to persons exposed to high physical and nervous loading, i.e., for athletes. It is reported that muscular activity and nervous loading causes the reaction of stress or stress-reaction that is reduced by usage of adaptogens (Nörr, 1993; Wagner, 1994; Wagner, 1995).

Adaptogenic activity

This concept was based on Hans Selye's theory of stress and general adaptation syndrome, which have three phases: alarm phase, phase of resistance and phase of exhaustion [13],

General adaptation syndrome [14]

Physiologists define stress as how the body reacts to a stressor - a stimulus, real or imagined. Acute stressors affect an organism in the short term; chronic stressors over the longer term. The general adaptation syndrome (GAS), developed by Hans Selye, is a profile of how organisms respond to stress; GAS is characterized by three phases: a nonspecific mobilization phase, which promotes sympathetic nervous system activity; a resistance phase, during which the organism makes efforts to cope with the threat; and an exhaustion phase, which occurs if the organism fails to overcome the threat and depletes its physiological resources.

Stage 1

Alarm is the first stage, which is divided into two phases: the shock phase and the antishock phase. ¬ Shock phase: During this phase, the body can endure changes such as hypovolemia, hypoosmolarity, hyponatremia, hypochloremia, hypoglycemia—the stressor effect. This phase resembles Addison's disease. The organism's resistance to the stressor drops temporarily below the normal range and some level of shock (e.g. circulatory shock) may be experienced. ¬Antishock phase: When the threat or stressor is identified or realized, the body starts to respond and is in a state of alarm. During this stage, the locus coeruleus and sympathetic 9 nervous system activate the production of catechol amines including adrenaline, engaging the popularly-known fight-or-flight response. Adrenaline temporarily provides increased muscular tonus, increased blood pressure due to peripheral vasoconstriction and tachycardia, and increased glucose in blood. There is also some activation of the HPA axis, producing glucocorticoids (cortisol, aka the S-hormone or stresshormone).

Stage 2

Resistance is the second stage. During this stage, increased secretion of glucocorticoids intensifies the body's systemic response. Glucocorticoids can increase the concentration of glucose, fat, and amino acid in blood. In high doses, one glucocorticoid, cortisol, begins to act similarly to a mineralocorticoid (aldosterone) and brings the body to a state similar to hyperaldosteronism. If the stressor persists, it becomes necessary to attempt some means of coping with the stress. The body attempts to respond to stressful stimuli, but after prolonged activation, the body's chemical resources will be gradually depleted, leading to the final stage.

Stage 3

The third stage could be either exhaustion or recovery: Recovery stage follows when the system's compensation mechanisms have successfully overcome the stressor effect (or have

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completely eliminated the factor which caused the stress). The high glucose, fat and amino acid levels in blood prove useful for anabolic reactions, restoration of homeostasis and regeneration of cells. Exhaustion is the alternative third stage in the GAS model. At this point, all of the body's resources are eventually depleted and the body is unable to maintain normal function. The initial autonomic nervous system symptoms may reappear (sweating, raised heart rate, etc.). If stage three is extended, long-term damage may result (prolonged vasoconstriction results in ischemia which in turn leads to cell necrosis), as the body's immune system becomes exhausted, and bodily functions become impaired, resulting in decomposition. The result can manifest itself in obvious illnesses, such as general trouble with the digestive system (e.g. occult bleeding, melena, constipation/obstipation), diabetes, or even cardiovascular problems (angina pectoris), along with clinical depression and other mental illnesses.

Active Compounds Chemically, the adaptogens are typically either complex phenolics or tetracyclic triterpenoids/ steroids

III. DISCUSSION

The most effective use of specific adaptogens comes with the knowledge of the constitution of the patient, the particular actions of the individual herbs, and how these two interface. Herbal medicine in general is an art and a science. Understanding which parts of the plants are most potent and how they should be harvested to reap their full medicinal value are important aspects of herbalism. Because herbs and supplements are not regulated by the Federal Drug Administration, it can be tricky to find a quality product. Looking for a product that is standardized to the active or marker components can be helpful, as can knowing the actual therapeutic doses used either traditionally or in available research— unfortunately, many products on store shelves contain very low doses of multiple herbs that may not be of benefit

There are three main qualities an herb must have to be considered an adaptogen:

1. It must be nontoxic at normal doses.
2. It should support the entire body's ability to cope with stress.
3. It should help the body return to a state of homeostasis regardless of how the body has changed in response to stress—i.e. it should temper that which is hyper-functioning and support that which is hypo-functioning.[15]

IV. CONCLUSION

Adaptogens are often the foundation for any herbal medicine recommendation, the thought being to start first with something that can help restore balance and then proceed to work on the individual symptoms/needs. Selection of which adaptogen to use requires knowledge of the patient as an individual as well as an understanding of the properties of the plant.

Today, research into adaptogens comprises the following four areas:

(a) phytochemistry: isolation and structure elucidation of active constituents of adaptogenic plants;

(b) biochemistry and molecular biology: mechanisms of stress protective activity of adaptogens on the molecular and cellular levels;

(c) experimental and clinical pharmacology: efficacy and safety of adaptogens in stress related disorders on animals and humans;

(d) pharmaceutical development of herbal preparations/products that have well established medicinal use in evidence based medicine.

Present generation people are suffering from stress and this stress is resulting in fatigue. Stress induced fatigue is most common among people with or without disease. Fatigue may be also because of certain physical activity or physiological phenomenon that appears with physical stress or exhaustive exercise which reduces the physical endurance capacity. The drug which helps body in adopting to these stressor are known as Adptogens as previously mentioned.

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