



Review Article

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AYURVEDIC APPROACH TO COLD ADAPTATION AS PER HEMANTA SEASONAL REGIMEN: A REVIEW

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ABSTRACT

Ayurvedic therapy is holistic in nature which considers all the aspects of life along with seasonal aspects. For the promotion of health and prevention of disease seasonal regimen has been described in Ayurveda. Margasirsa (15 Nov.-15 Dec.) and Pausa (15 Dec. - 15 Jan.) months comes under the Hemanta season. Aim of this paper was to explain the Ayurvedic seasonal regimen described for the Hemanta season on basis of modern concepts. Seasonal regimen described in Ayurveda helps to nullify the effects of season. During the Hemanta season cold temperature stimulates the shivering and non-shivering type of thermogenesis in the body. These physiological changes increase the metabolic activities in the body which possibly is the reason of increased digestive power of the body. Ayurvedic scholars were aware with the physiological changes which occur due to the seasonal variations. Seasonal physiological changes and cold adaptations have been scientifically evaluated by various researchers. The review of above Hemanta seasonal regimen indicates that Ayurvedic seasonal regimen have sound scientific base and these scientific validations could justify their incorporation into modern health system.

Keywords: Seasonal regimen, Hemanta, Non-Shivering thermogenesis, shivering

INTRODUCTION

Ayurveda is a science of life. Seasonal regimen described in Ayurvedic classics is based, purely on scientific principles. Purpose of this paper was to explain the Ayurvedic seasonal regimen described for the Hemanta season on basis of modern concepts. According to Ayurveda Moon by its smoothening rays makes the universe moist and sun dries it up with his scorching rays. Vata with the help of sun, and the moon maintain the climate of the universe, these three are responsible for appearance of season, rasa, dosha and bodily strength in the nature. A year is divided into two ayanas dakishnayana or Visarga kala or southern solstice and uttraayana or Adana kala or northern solstice. Visarga means releasing and aadana means receiving, is the work of moon and sun respectively¹. Further these two solstices divided into six seasons. Northern solstice cause dehydration in the nature and bring about three seasons Sisira (Late winter), Vasanta (spring), and Grishma (summer) respectively. The southern solstice and its act of hydration is the cause of other three seasons Varsha (Rainy), Sarad (autumn) and Hemanta (Early winter) respectively. Again, each season divided into two months. Margasirsa (15 Nov.-15 Dec.) and pausa (15 Dec. - 15 Jan.) months comes under the Hemanta season². During this period moon is more powerful than Sun, the heat of the Earth is taken away by clouds, rain and cold wind. Unctuousness sets in the atmosphere and sweet taste is predominant in nature, so the strength of person enhances during this period³. Following diet and regimen described in Ayurveda for Hemanta season helps in promoting health and fight against the diseases caused by seasonal changes or perverted seasons.

HEMANTA SEASON AND AGNI (DIGESTIVE FIRE)

The human thermoregulatory system relies on behavior and on physiological responses for thermal homeostasis⁴. Researches have proved that the cold exposure often increases food intake

in rodents⁵. In Ayurveda, it has been said that during the Hemanta season the digestive power of a healthy person is increased due to the restraint caused upon by the cold wind, so much so that it is capable of digesting any food stuff irrespective of its heaviness and quality⁶. This increased digestive fire cause frequent hungeriness in winter season. Fall in environmental temperature and cold air cause excitation of the cold receptors present in the skin. Due to this excitation of the receptors, stimulation of hypothalamic body feedback system decreases heat loss from the body to the environment. This heat loss is controlled by decreasing sweating, vasoconstriction and piloerection. Along with it body starts cold induced thermogenesis. This thermogenesis is of two types⁷

1. Non-shivering thermogenesis (NST) or chemical thermogenesis
 2. Shivering thermogenesis (ST)
- Both of these heat conserving and thermogenesis processes maintain the homeostasis of the body and protects us from hypothermia.

1. Non-Shivering Thermogenesis (NST)

NST thermogenesis is also known as chemical thermogenesis. During cold season our body is working hardly to maintain our core body temperature at optimum level. Low environmental temperature stimulates the sympathetic nervous system (SNS). Epinephrine and nor epinephrine thus increased in body uncouples oxidative phosphorylation. In this process heat is generated without ATP formation. Cold weather also affects the secretion of the thyroid Stimulating hormone (TSH). TSH secretion is increased in cold weather which further increase metabolic rate of the body⁸. White Adipose Tissue (WAT) and Brown Adipose Tissue (BAT) are the two main types of fat in mammals. WAT is the primary energy depot that stores energy as triglyceride-enriched lipid droplets. BAT contains much

higher number of mitochondria which gives BAT its brown color. Brown fat also contains more capillaries than white fat, to supply the tissues with oxygen and nutrients and distribute the produced heat throughout the body. BAT is considered as an energy dispenser that consumes significant amounts of lipids and carbohydrates to produce chemical energy toward thermogenesis^{9,10}. Cold temperature is a natural stimulator of BAT thermogenesis¹¹.

2. Shivering Thermogenesis (ST)

In a cold environment, Stimulation of cold receptor causes excitation of primary motor center of hypothalamus which in turn gives signal to the skeletal muscles to increase muscular tone¹². This process facilitates activity of anterior motor neurons to start shivering. The shivering reflex is triggered to maintain the homeostasis. Heat production increases by 10–30 W during the initial first minutes without any increase of muscle activity^{13,14}. Later, extra heat is generated by involuntary contractions of skeletal muscles. Shivering occurs when core and skin temperature surpass a certain threshold and may produce heat equivalent to about 4 times resting metabolism¹⁵.

DIET IN HEMANTA RITU

In Hemanta season digestive fire is increased due to the cold. Researches have shown that the food consumption capacity is increased in cold weather⁵. This digestive power is nothing but the metabolic activities going on in our body. NST and ST of thermogenesis increase the heat production of the body. Because fatty acids are the main fuel for non-shivering thermogenesis, increased lipid increased lipid accumulation may help to cope with subsequent cold exposure. Increased metabolic rate required energy dense food and highly nutritious diet. In cold weather fat accumulation is also required for insulation. It is our primitive impulses which promote us to stockpile calories for the winter. Proteins and alcohol have high thermogenic effect with respect to the carbohydrate and fat that's why protein rich diet is mentioned in this season. According to the Charaka when body does not get the proper fuel in the Hemanta season, the digestive power affects the nutritive fluids, resulting in the vitiation of vata having cold properties. Therefore, during the winter one should take the unctuous, sour, and salty juices of the meat of the aquatic and marshy animals which are fatty. One should also eat the meat of burrow dwelling animals and keema (a preparation of meat by mincing it) prepared of animals of prasha type (one eats by snatching). There after one should drink madira and sidhu types of wine and honey. If one habitually takes preparation of cow's milk, cane juice, fat, oil, new rice and hot water during this season his life span is never decreased. One should avoid food and drinks which are light and are liable to vitiate Vata. One should not expose himself to cold wave, under feeding and intake of gruel is also to be avoided¹. According to the Charaka when body does not get enough food in the Hemanta season, the digestive power will burn away the rasadi dhatus⁶. Metabolically active BAT in adults is activated by cold exposure. This activated BAT increases energy expenditure^{16,17}. After lipid depletion the brown adipose tissue has to depend on exogenous energy sources such as glucose and fatty acids to maintain the thermogenesis. This BAT activation is also related to the decreased adiposity in humans¹⁸.

REGIMEN IN HEMANTA SEASON

The behavioral mechanisms of temperature regulation are complex. The basic adaptations are activity, body posture, and the creation and selection of a microclimate with the help of clothing and shelters. According to the Ayurveda in this season

one should resort to massage with warm oil, fomentation. One should reside in an underground residence and inner heated apartment of a building^{19,20}, shelter can be sought for instance to reduce the effect of wind. We adapt our body posture to minimize heat loss. For instance, newborns show skin exposure of 79% when in thermal comfort and 69% when exposed to a cool environment²¹. More specifically and more importantly in the cold, physical activity may increase to generate more heat. Clothing is selected in such a way that thermal equilibrium can be maintained. A population study showed that people tend to select clothing which insulation values corresponds to those estimated/ or calculated to provide thermal equilibrium²². This thermal need exceeds cultural aspects of clothing as has been shown in India, where the clothing style was shown to depend not only on cultural but also on climatic conditions^{23,24}. In Ayurveda, it has been mentioned that in winter one should see that the conveyance, bedding and seat are well covered specially by heavy wrappers, skin, woolen cloths and blankets. One should wear heavy and warm cloths. Clothing choice is depending upon the ability of cloths to reduce heat loss caused by radiation and convection²⁵. Adequate clothing systems and well insulated or heated homes and/or vehicles enable good protection against cold. The behavioral and physiological responses to heat and cold should be considered as closely interwoven. There is evidence that the feeling of (dis)comfort drives the behavioral actions. Since the feeling of (dis)comfort is linked to skin temperature, also correlations between skin temperature and thermal behavior are observed²⁶.

CONCLUSION

Ayurvedic therapy is holistic in nature which considers all the aspects of life along with seasonal aspects. The review of above Hemanta seasonal regimen indicates that Ayurvedic seasonal regimen have sound scientific base and these scientific validations could justify their incorporation into modern health system. Diet and regimen described in Ayurveda helps to nullify the effects of season. Following Ayurvedic life style helps in promoting healthy life and curing diseased state. Ayurvedic scholars were aware with the physiological changes which occur due to the seasonal changes. Seasonal physiological changes and cold adaptations have been scientifically evaluated by various researchers. Furthermore, researches should be done on Ayurvedic seasonal diet and regimen and their health promotional effects.

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