Role of Vyayama in the Prevention of Hridroga w.s.r. to Heart Diseases

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Abstract
Charaka described 107 marmas in the body. Among these Basti, Hridaya and Murdha are three marmas considered as pradhanabhuta marma. If Vatadi dosha are vitiated through the nidana sevana, these three vitiated doshas also vitiate the prana and its ashraya sthana – marma are also responsible for the development of different diseases. Vyayama has direct effect on the causative factor of dosha dushti, which ultimately affects vital organs like Basti, Shira, Hridaya etc. According to modern concepts exercise improves muscle tone, work capacity, appetite and blood circulation, which helps the heart muscle to become strong and more efficient. In addition, the entire circulatory system works more efficiently due to vascular dilatation and cholesterol reduction. Exercise reduces fatigue, weight, reduces stress, anxiety and depression, which are the ultimate causative factors of heart disease. Vyayama is a one of the best concept for prevention of diseases of Hridaya (heart).

Keywords
Vyayama, Trimarma, Hridaya

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INTRODUCTION
Charaka described 107 marma in the body. Acharya divided all the marma into two parts—Skandha ashrita and Shakha ashrita. Shakha ashrita marmas depend on the Skandha ashrita marma. Charaka considered Skandha ashrita marmas as a mool (root) of the sharir (body). Marmas are the junctions of mamsa, asthi, snayu, dhamani, sira and sandhi. They are vital parts of the body as they are also described as pranayatanam. Charaka said that if marmas are vitiated by any kind of traumatic injury or dosha, it is more painful because the marmas are the main location of chetana (consciousness). Among all Basti, Hridaya and Murdha are three marmas considered as pradhanabhuta marma. If Vatadi doshas are vitiated through the nidana sevana, the three vitiated doshas also vitiate the prana and its ashraya sthana—marma; also responsible for the development of different diseases. Vyayama is described in the chapter of Naveganadharniya by Charaka under swastha chatuska. Preventive aspects are described in this chapter.

AIMS AND OBJECTIVES

- For the evaluation of effect of vyayama on the Hridaya (heart).
- Give the society cost effective and beneficial Ayurveda remedy.
- Evaluate the prevention aspect of Hridaya roga.

ANATOMY AND PHYSIOLOGY OF HRIDAYA:
According to Charaka Samhita, Hridaya is also recognized as mahat and artha. Location of the heart in the thoracic cavity and its shape has been described like a lotus bud having its apex on the reverse side. Hridaya (Koshthang) is situated in between two mammary glands. Diseases which are occur in trimarma described under madhyama rogamarga. All these three pathways are connected with each other with dhamani and sira. According to Shushrut, rasavaha dhamani and pranvaha dhamani are directly situated in the Hridaya. According to Charaka Hridaya is a prime location of chetana (consciousness). Sharangadhar also commented that pranavayu is situated in the Hridaya. Hridaya is also location of oja which is circulated in the whole body by rasavaha dhamani.

VYAYAMA
The physical activity that leads to fatigue in the body is called as vyayama.

**Vyutpatti (Etymology)** - Vyayama is the combination of the “Vi + A+ Yam”\(^{10}\)

**VYAYAMA PARIBHASHA**

The activities or karma which induces tiredness in the body are called as Vyayama\(^{11}\). Vyayama includes the activities of the body done with intention of producing firmness and strength. The chesta (activity) or karma which induces tiredness to physical body is called as Vyayama. Vyayama is one which creates lightness in the body, increases the ability to do work, makes body compact, mitigates the increased dosha and increases the digestive power\(^{12}\).

**Duration of Vyayama:**

One has to perform the Vyayama up to utilization of ardhashakti i.e., a person who is seeking his own good health should perform physical exercise every day only to the half extent of his capacity as otherwise it may be harmful or even fatal\(^{13}\). The amount of exercise which makes the pranavayu comes out through the mouth as soon as hard breathing sets in; it is known as the balardha vyayama. Appearance of perspiration on nose, axilla, fore head and in joints of the palm and feet and dryness of the mouth denotes the ardhashakti of an individual\(^{14}\).

The Vyayama requires careful attention especially in regard to limit the duration and suitable condition for its practice. It is recommended with emphasis not to make an attempt for any physical exercise or body exertion beyond capability, otherwise serious consequences are likely to occur and adversely affect human body. By attaining balardha, mouth starts becoming dry due to aggravation of Vata which is present at Hridaya\(^{15}\).

**Specific nidana of Hridaya roga (Etiological factors) are as under:**

**Hridaya** – Chinta (Anxiety), Bhaya (Fear), Trasa (Phobia), Tikshna vireka-Basti (Drastic purgation and Basti), Chhardi (Emesis), Gadatichar (Iatrogenecity) etc\(^{16}\).

**Exercise**

Any physical activity that raises the heart rate is exercise. Exercise is a type of physical activity that one plans to do specifically to improve one’s physical fitness. Vyayama is also a physical activity\(^{17}\).

**DISCUSSION**

After digestion of the food ahara rasa nourishes other dhatus through trimarma. Hridaya is the srotomula of two srotasa –
pranavaha and rasavaha. Ahara rasa is entering from koshtha to shakha with the medium of Hridaya.

Vyayama was described in Navegannadharniya adhyaya after the description of dharniya and adharniya vega (urges). Due to suppression of vega, gati of Vata (motion) become reversed (pratiloma) and it circulates in all regions. Vata enters in the pachyamanashaya or grahani. Nabhi, which is situated between aamashaya and pakwashaya, is responsible for circulation of the ahara rasa into Hridaya through dhamani. Vitiated dosha enter into the Hridaya and also develop pathology related to the organ. Chinta, Bhaya etc. are the causative factor of Hridaya roga and they are also described as dharniya vega (suppressible urges). According to Ayurveda literature, Vyayama has some beneficial effect like Laghuta (lightness of the body), Karma Samarthya (improve physical strength), Sthairya (stability), Dukha Sahishnuta (increase endurance power), Dosha Kshaya (allevation of dosha). Vyayama creates lightness in the body and regulates the circulation of ahara rasa. It decreases the vitiated Vatdi doshs which are causative factor of marma roga.

EFFECTS OF EXERCISE ACCORDING TO MODERN CONCEPT:

Cardiovascular responses to Exercise

Exercise is characterized by increased energy expenditure in the exercising muscles. In order to meet the increased demand for energy, blood flow through the exercising muscles increases. This is made possible mainly by increasing the cardiac output and to some extent by reducing blood flow through some other areas of the body.

Skeletal muscle Blood flow

At rest, skeletal muscles receive about one liter of blood per minute i.e., 1/5th the cardiac output during maximal exercise. The skeletal muscle blood flow may exceed 20 L/ min and much of the increase is confined to the muscles involved in exercise. The enormous increase in blood flow is made possible by arteriole dilation and opening up of closed capillaries.

Heart Rate

The heart rate increases because of the stimulation of the sympathetic nervous system i.e., during prolonged exercise local and humeral factors possibly contribute to the sustained increase in heart rate. Muscle tissue has free nerve endings which are
stimulated by lactic acid, potassium ions and other chemicals which collect in exercising muscles. Stimulation of these nerve endings brings about reflux tachycardia. Release of adrenaline, nor adrenaline and possibly thyroid hormones during exercise also contribute to the increase in heart rate. These are intrinsic factors which increase the heart rate during exercise increase in venous return stretches the right atrium and consequently the Sino arterial node leading to an increase in heart rate this is known as ‘Brain bridge effect’. Increased activity of the heart during exercise raises body temperature which in turn directly increases the rhythm of the pace maker. The heart rate comes down after exercise but complete return to resting level takes considerable time. The continuing tachycardia after exercise is likely to be due to the effect of local metabolites in exercising muscle, hormones and temperature. The heart rate increases depending up on the type of the exercise and severity of the exercise$^{21}$.

**Cardiac Output**

Cardiac output is the product of heart rate and stroke volume. An increase in both contributes to increase in cardiac output during exercise. The cardiac output may increases from 5 liter/min (normal value) to 30-35 liter/min depending up on the type of exercise$^{22}$.

**CONCLUSION**

*Vyayama* prevent the vital organs like *Basti*, *Shira*, *Hridaya* from the causative factors. According to modern researches, exercise improves muscle tone, work capacity, appetite and blood circulation, which helps the heart muscles to become strong and more efficient. In addition the entire circulatory system works more efficiently due to vascular dilatation and cholesterol reduction. Exercise reduces fatigue; reduce weight, stress, anxiety and depression which are the ultimate factors for heart diseases. *Vyayama* is one of the best aspects for prevention for *Hridaya roga* (heart diseases).
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