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End result of physical exercise with pathological increase in Lactic Acid

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ABSTRACT

Ayurveda advises adhering to the practices described by our *Acharyas* for well being. *Ritucharya* offers guidance on food plans that are suitable for overcoming the effects of seasonal fluctuations. We must adhere to the *Ayurvedic* prescriptions in order to maintain our mental, physical, and nutritional wellness. Between around mid-May and mid-July is the *Grishma* (summer) season. It is common for the ecosystem to experience intense heat and dangerous wind, and then comes the rain with heat and humidity thus the strength of individual gets decreased. According to *Acharya Charak*, the *Vayayam* is stated in *Sutra Shana 7/31*, which mentions that keeping the body in accordance with will power through engaging in *Yogasana*. For the appropriate maintenance of physical health many *Acharya* have explained that in *Grishma Ritu* exercise should be performed at half the level of actual strength and up to when sweat appear on forehead. The body's lactic acid levels rise during activity, which causes an oxygen level reduction. Exercise-induced lactic acidosis is often a temporary condition. The body's pH level drops to 7.4 to 6.6. Lactic acid levels are decreased by vitamin C, magnesium, and drinking water. Exercise also causes lactic acid levels to drop after an hour. There are many ill effect of excess lactic acid on different organs as liver, kidney, lungs, heart, muscle etc. Any source of sea food, as well as beans, leafy greens, nuts and seeds, salmon, fish and mackerel, keeps the amount of lactic acid stable.

Key words: Exercise, Lactic Acid, Health, Grishma Ritu, Ritucharya

INTRODUCTION

Ayurveda is a science of life that focuses both the treatment of *Rogis* and the up keep of people in good health. The practices outlined by our *Acharya's* are recommended by *Ayurveda*. *Ritucharya* provides advice on dietary regimens that are appropriate for

combating the impacts of seasonal variations.^[1]

All the news papers and media are filled with reports of cardiac arrest while doing the exercises. What has changed in the whole scene of fitness and where things are going wrong is unexplainable. According to conventional science *Ayurveda* gives an exact optimum practice of physical exercise according to every season, when critically observed it's seen up around accumulation of lactic acid.

According to *Acharya Charak: Vayayam*, is mentioned in *Sutra Shana 7/31*, which advises exercising *yoga* poses to keep the body in line with will power. Exercise must be done up to when sweat appear on forehead and half of strength of your body.^[3]

Many *Acharya* have mentioned that in *Grishma Ritu* exercise should be performed at half the amount of actual strength in order to preserve physical health in the proper manner. During exercise, the body's lactic

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acid levels grow, which lowers the oxygen level. Lactic acidosis brought on by exercise is frequently a transient condition^[2]

To maintain our mental, bodily, and nutritional well-being, we must follow the *Ayurvedic* prescriptions. The summer season lasts from around mid-May to mid-July. The habitat frequently experiences hazardous wind and extreme heat. Exercise is a sort of physical activity that enhances or maintains overall health and wellness as well as physical fitness.^[2]

The pH of the body falls to 7.4 to 6.6. Magnesium, vitamin C, and consumption of water, all help to lower lactic acid levels. Lactic acid levels begin to decline 1 hour after exercise. Any type of seafood, beans, leafy greens, nuts and seeds, salmon, and mackerel all help to maintain an appropriate amount of lactic acid in the body.^[7]

MATERIAL AND METHODS

Accumulation of lactic acid during exercise, half the exercise during summer season according to strength, diet to promote the good health during summer season, where thoroughly reviewed from various sources:

- Classical text of *Ayurveda*,
- Modern literatures,
- Scientific journals,
- Monograph and
- Internet etc.

OBSERVATION AND DISCUSSION

Ayurveda is a science of life that focuses on both treating *Rogis* and maintaining the health of healthy people. *Ayurveda* recommends following the practices outlined by our *Acharyas* in order to preserve the balance of health in each *Ritu*. *Ritucharya* gives us advice on dietary regimens that are appropriate for coping with the consequences of seasonal changes. To preserve our physical and mental nutritional health, we must follow the *Ayurvedic* recommendations.^[1]

The *Grishma* (summer) season lasts from around mid-May to mid-July. Extreme heat and hazardous wind are the norm in the environment. The water bodies have

dried, and the vegetation seems dead. *Agni* and *Vayu* are the two *Mahabhutas*, with the pungent *Katu Rasa* predominating. The person's vigour declines and *Vata Dosh*a deposits, however the vitiated *Kapha Dosh*a is calmed during this season. The individual's *Agni* will continue to be modest.^[2]

Due to the increased Sun rays in the *Greeshma Ritu*, the *Sneha Guna* of *Bhoomi* and *Shareera* dries up. Additionally, the person's *Bala* significantly decreases when *Kapha* gradually decreases and *Vata* eventually rises. Rice, lentils, and other meals with the *Gunas*. *Madhura* (sweet), *Snigdha* (unctuous), *Sheetal* (cool), and *Drava* (liquid) are examples of foods that are simple to digest. Drinking a lot of water and a variety of liquids, such as cold water, butter - milk, fruit juices, meat soups, mango juice, and curd that has been churned with pepper, should be practiced.^[3]

It's advantageous to take a nap through-out the day, wear light clothing, massage sandal wood and other scented pastes on your body, and stay in a cool environment. At night, one can take pleasure in the breeze-cooled moonlight. Refrain from excessive physical labor or exertion, excessive sexual indulgence, and alcohol consumption. *Lavana* and food with *Katu* (pungent) and *Amla* (sour) taste and *Ushna* (warm) foods are to be avoided.^[4]

Excessive long-term endurance training may cause the heart and major arteries to change structurally in a pathological way. Recent research suggests that long-term preparation for and participation in extreme endurance competitions, such as marathons, ultra-marathons, iron man distance triathlons, and very long bicycle races, can result in transient acute volume overload of the atria and right ventricle, as well as transient elevations of cardiac biomarkers and temporary decreases in right ventricular ejection fraction.^[2,5]

Effect of lactic acid on different organ (If exceed) ^[6]	Organ Name
1. Liver	▪ Liver cirrhosis
2. Kidney	▪ Kidney failure

3. Lungs	<ul style="list-style-type: none"> Respiratory failure
4. Muscle	<ul style="list-style-type: none"> Muscle cramps
5. Body	<ul style="list-style-type: none"> Body aches
6. Heart	<ul style="list-style-type: none"> Heart rate increase, Inadequate tissue perfusion

When a person experiences a high energy demand, frequent fluctuations in the energy demand, and a deficiency in oxygen, lactic acid is created and builds up in the muscle. Muscle pH decreases to between 6.4 and 6.6 during prolonged, severe exercise.^[7]

Muscle soreness and tiredness are caused by lactic acid production. Anyone who has gone through an intense physical activity will be familiar with "feeling the burn" the state of exhaustion and discomfort that develops from repeatedly lifting enormous loads or running at full speed. Stomach pain, nausea, fast breathing, burning in the muscles: If you've ever felt the uncomfortable symptoms of lactic acidosis, you probably recall them.^[8,9]

Exercise-induced lactic acidosis is often transient. It occurs when your bloodstream becomes very acidic. All of this lactic acid usually disappears after an hour. Simply put lactic acid exits the body before any muscular pain appears. The body eliminates lactic acid through metabolism. Deep breathing exercises, consuming lots of water, and reducing activity intensity are the best ways to promote natural lactate clearance.^[10]

The effect of the antioxidant vitamin C on the development of *Lactobacillus thermophilus* A69 cells and the production of lactic acid was investigated in the current study. 75 ml of vitamin C greatly enhanced cell proliferation and lactic acid buildup. Magnesium speeds up recovery by assisting with acid dissipation. Thankfully, the list of foods high in magnesium is endless. It comprises almost any type of seafood, including nuts and seeds, beans, leafy greens, salmon, and mackerel. Drinking water helps to dilute the lactic acid and flush it out of the body. Water supplies the

much-needed oxygen and hydrogen ions to the blood. Hydration is key to lowering lactic acid levels because water is supplying what the muscle cell crave, Oxygen and Hydrogen ions. The vitamin C in lemon water helps flush out lactic acid stored in muscles from the workout that you did the previous day. The antioxidant alone may reduce your likelihood of getting injured by up to 25%.^[11]

Lactic acid is produced by both muscle cells and red blood cells. It appears when the body processes carbohydrates into glucose under particular conditions while exercising. Lactic acid is the byproduct of glycolysis, or the breakdown of glucose, which produces ATP energy in the absence of oxygen in muscle cells.^[12]

Health conditions and infections that make it harder for your body to get fresh oxygen to your cells can raise your lactic acid levels. This can lead to lactic acidosis - a dangerously high lactic acid level. Lactic acidosis is a serious health condition that can be fatal. Ice baths drain the lactic acid out of your muscles, and afterwards, your muscles will warm back up, helping you to recover quicker. Grab a couple bags of ice, fill your bath with water and dump the ice in.^[13]

CONCLUSION

According to many *Acharya*, in *Grishma Ritu*, exercise should be performed half as hard as it would normally be because doing so increases the lactic acid balance, which can have harmful effects on various organs when done in excess. In order to maintain the body's normal physical and mental status as well as the lactic acid balance, it is also advised to consume a proper diet, vitamin C, magnesium, and lots of water. Salmon, mackerel, beans, leafy greens, nuts, and seeds all help to maintain a constant level of lactic acid in the body. Exercise should be performed in an appropriate amount to maintain the lactic acid balance and lead a healthy lifestyle.

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