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## Thermotherapy: A boon in sports injuries

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### Abstract

The aim of this study is to show that how thermotherapy is beneficial in the recovery of athletes having strain. Thermotherapy plays an important role in the recovery. Thermotherapy or heat therapy is the finest way to maintain and restore the strength and functional ability of an athlete. In this study 50 athletes are taken for the purpose of study the effect of various modalities of thermotherapy. In this different modalities of thermotherapy are given to no of athletes.

Later in the study on the basis of healing it was found that the infrared rays are more effective modality among the others.

**Keywords:** Thermotherapy, infrared rays, strain, athletes, strength

### Introduction

Thermotherapy is also known as heat therapy and it is the oldest way to treat injuries/pain relief by the use of heat in therapy. Its use is spread worldwide because of its effectiveness. Basically physiotherapy is used for rehabilitation purpose. Using various therapy, it helps the various athletes to get relief from pain in the muscles and joints along with soft tissues. It reduces the pain by rising the temperature of the soft tissues, metabolic rate and also increases in the blood flow by vasodilatation. Due to rise in the blood flow, the oxygen uptake increases which helps in the healing of the damage tissues. Deep heating helps to reduce the sensitivity of the sensory nerves, decrease in muscle spindle, root to muscle relaxation and also increase in flexibility. Physiotherapy can take in the form of hot cloth, hot water bottle, infrared, ultraviolet rays, shortwave diathermy, heating pads, whirlpool bath, sauna bath and etc. Physiotherapy is an effective self-care treatment.

### Thermotherapy

Thermotherapy is used in all over the world for medical purpose to reduce pain and stiffness of the muscle, decrease in muscle spasm and increase in the blood flow for repairing of the damage tissues. Uninterrupted low-level of heat therapy apply directly on the superficial has been shown as effective for aiding musculoskeletal disorders. There are mainly three phases of the healing process:

1. The inflammatory phase.
2. The proliferation phase.
3. The remodeling phase.

In the first phase, the cryotherapy is used to reduce the inflammation/swelling and to protect the injury to get injury worse although the body contains the damage tissues. Thermotherapy/heat therapy is used during the second phase of the healing process that is proliferation phase, when the scar tissue and new tissue are formed. It helps to aid the injured part. Thermotherapy can also when the injured part/damaged tissues regain their strength and functions. Various thermotherapies are as follows:

### Infrared Rays

Infrared rays are the invisible electromagnetic waves with wavelength of 750-400,000 nanometers. Any hot body emits the infrared rays like the sun, gas fire, coal fire, electric fire, electric heater, hot water pipes and etc. The infrared rays are mainly produced by two types of

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generators: Luminous generator and Non-luminous generator. The luminous generator emits the visible rays as well as the infrared rays of shorter wave length, so the luminous generator has a leading penetration and is usually called radiant heat and the non-luminous generator emits the pure infrared rays of longer wavelength.

### UV Rays

UV rays are electromagnetic waves. In this modality of therapy, the skin exposing to ultraviolet light for the recommended duration of time. This therapy also includes the use of other forms of light such as lasers and fluorescent lamps. When the objects heated to a very high temperature emits rays of too short wave length along with ultraviolet rays which are not seen with naked eyes. UV rays penetrate the tissue to a limited extent. The human skin affirms UV radiation apart from a depth of two millimeters. The main sources of the ultraviolet ray's therapy are as below:

1. Sunlight.
2. Mercury vapor lamp.
3. Fluorescent tubes.

### Shortwave Diathermy

Shortwave diathermy uses the high frequency electromagnetic waves between 10000000-100000000 hz. It allows the deepest form of the heat available to the physiotherapist. In the shortwave diathermy operations uses the band frequency of 13.56, 27.12 and 40.68 megahertz. Shortwave diathermy mainly uses the three kinds of electrodes: pad electrode, plate electrode, disc electrode. All these three electrodes are consisting of a metal plate which is enclosed by some form of insulating material. First one consist of thin metal plate enclosed with rubber pad, second type of electrode is consisting of thick metal plate enclosed with a thin insulating rubber pad, and third type of electrode consist of transparent plastic cover alongside of a metal plate.

### Whirlpool Bath

From the ancient times the water is used as a therapeutic purpose. In the ancient time the whirlpool bath becoming a valuable physiotherapeutic treatment. The principle of whirlpool bath therapy is to combine the effects of temp. With the mechanical effects of the water. Water temp of warm whirlpool ranges between 36 to 45 °C and an air stream produces turbulence in the water. Turbulence may be produced by the electric motor; this bath is used for the treatment of the limbs or the whole body. Treatment is mainly suggested for 15-20 min. depending upon the area and condition of the injured part. Its use seen on large scale in the sports medicine for relaxation purpose after the practice or competition.

### Hot Water Fomentation

Hot water treatment offering with the help of a piece of cloth, sponge, a bottle or rubber bag, etc. to the injured part of the body is called hot water fomentation. Most of the hot packs allows the steaming to a larger area from a longer period of time, which result in warm and gives relaxation in the muscles and also relief pain in the deeper tissues. Wrapping a dry hot source with a moist cloth is another method such as: wrapped a moist washed cloth over the hot water bottle. Most of the times a longer application of the hot packs results in better pain tolerance/relief. In the wet fomentation the fomentation is given with a piece of cloth dipped in a hot water and then squeezing. Contrast bath is also very beneficial

for the tolerance of pain. Most of the time it is better to use a dry heat source like, heat pad, electric heat pad, etc. After giving the treatment with the hot fomentation it is better to rub the part with cold compress or rinse with the cold water to close the pores of the skin to stop sweating and avoid chilling.

### Therapeutic Benefits

The one of the main benefit of the thermotherapy is relief of pain, when heat is mild, there is a sedative effect on the superficial sensory nerve endings, muscle relaxation is brought due to the relief of the pain and also due to the direct effect of heating rays in the tissues, thermotherapy increasing the blood flow which helps in healing process of superficial wounds and in case of various skin infections due to increase in blood supply the no of white blood cells also increase in numbers, which help in killing the bacteria. Increase in blood flow/supply also help to eliminate of waste products. Thermotherapy also improves in the formation of Vitamin D, thermotherapy also have some general tonic effects.

### Methods and Procedures

50 Athletes having strain were taken for study of the effect of various modalities of thermotherapy on healing of sports injury strain (tearing of tendons). Subjects were kept under supervision over the period of a month. 50 athletes were divided into 5 groups, 10 subjects in each group. Five different modalities were applied on five different groups respectively. It has been noticed earlier in the study that all five different modalities of thermotherapy take their own time to heal the strain (tearing of tendons). In the time period of a month it is noticed that some of the modalities start healing from the first week of the treatment and some were show their impact after 10-12 days of the treatment start, but in spite of all these modalities infrared rays are more favorable in fast healing or quick recovery of the athletes having strain.

### Summary and Conclusion

In the end of the study it is concluded that every modality of thermotherapy has its own pace in the healing of athletes having strain (tearing of tendons). But infrared rays are having more healing effect among the other modalities of thermotherapy for the athletes having strain (tearing of tendons).

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