

## PREVENTION AND MANAGEMENT OF HEAT STROKE (ANSHUGHAT) IN AYURVEDA: A REVIEW

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### ABSTRACT

Heat stroke is the most serious form of heat injury and is considered a medical emergency. It may occur when a person stays under the sun for a long time. Heat stroke can kill or cause damage to the brain and other internal organs. The hallmark symptom of heat stroke is core body temperature above 104<sup>0</sup>F. But fainting may be the first sign. Ayurveda is a safe and a natural healthcare system that involves the use of natural herbs for managing any health problem. Ayurveda says in case of heat stroke, it is the *Pitta dosh* that gets aggravated and in *Susruta Samhita* it is called as *Ushntaap* and in *Bhaishajya Ratnawali* it is called *Anshughat*. In Ayurveda, with the help of some herbs such as *Narikel*, *Amalaki*, *Chandan*, *Kamal*, *Parpat*, *Usheer*, *Taruni*, *Gambhari*, *Trapusa*, *Yavas* and *Duralabha*, which can reduce the body heat and maintain the *Pitta dosh* in balance can be used to prevent and treat heat stroke. This paper is a review of prevention and management of heat stroke according to ayurveda.

**Keywords:** heat stroke, fainting, hallmark

### INTRODUCTION

Heat stroke is a form of hyperthermia in which the body temperature is elevated dramatically. In Ayurveda, heat exhaustion or heat stroke is known as *Usnataap*<sup>1</sup> or *Aanshughata*<sup>2</sup>. It results from prolonged to high temperatures usually in combination with dehydration which leads to failure of the body's temperature control system. The medical definition of heat stroke is a core temperature greater than 104 degrees Fahrenheit, with complications involving the central nervous system that occur after exposure of high temperatures. Other common symptoms include nausea, seizures, confusion, disorientation and sometimes loss of consciousness or coma<sup>3</sup>. One of

the complications that could arise from this condition is the loss of blood flow, which in turn could lead to severe shock. This is quite a serious problem, as shock can lead to a significant amount of damage, if not treated in time. Some of the immediate signs of shock include a drop in blood pressure, cool or clammy skin and changes in the color of the lips and nail, where they take on a bluish tint. Just about anyone can suffer from a heat stroke but there are some people who are more susceptible to this condition, as compared to the others. Senior citizens are more likely to suffer from this problem, because of a weakened immune system. Even those children who

have under-developed immunity are at a much higher risk of heat strokes. You could also suffer from this condition, if you are not used to the heat and humidity, but suddenly have to spend some time in an environment where the temperature is quite high. The use of certain medication could also increase your chances of getting a heat stroke. There are different factors that can lead to a heat stroke, such as high environmental temperatures, strenuous physical activity as well as any other conditions which can elevate the temperature of the body<sup>4</sup>.

Ayurveda says that there are three *Doshas* of our body which are considered as the energies of the body. The *Doshas* are *Vata*, *Pitta* and *Kapha dosha*. Aggravation of any of the *Doshas* results in health problem. In Ayurvedic concept of heat stroke or hyperthermia, it is the *Pitta dosha* that gets aggravated. When there is aggravation of the *Pitta dosha*, body temperature becomes very high. Increased *Pitta dosha* leads to disruption of normal metabolism of the body<sup>5</sup>. Herbs that balances *Pitta dosh* in the body can be very effective in preventing and treating heat-stroke. In Ayurveda many herbs that have cold potency and *Pitta* reducing property like *Amlaki*, *Giloy*, *Parpat*, *Usheer*, *Chandan*, *Gambhari*, *Narikel* etc plays key role in balancing body temperature by reducing elevated *Pitta* in body.

### Causes

The body normally generates heat as a result of metabolism, and is usually able to dissipate the heat by radiation of heat through the skin or by evaporation of sweat. However, in extreme heat, high humidity, or vigorous physical exertion under dissipate the heat and body temperature rises, sometimes up to 106 F(41.1 C) or higher. Another cause of heat stroke is dehydration, enough to dissipate heat, which causes the body temperature to rise<sup>6</sup>. General causes of heat stroke are<sup>7</sup>:

- Staying for long in high temperature and humid areas.
- Excessive exercising
- Wearing excessive warm clothing
- Consumption of alcohol

- Malfunctioning of sweat glands

This reduces the body's ability to manage body temperature

### Symptoms<sup>8</sup>

**High body temperature:** A Body temperature of 104 F or higher is the main sign of heat stroke.

**Altered mental state or behavior:** Confusion, agitation, slurred speech, irritability, delirium, seizures and coma can all result from heat stroke.

**Alteration in sweating:** In heat stroke brought on by hot weather, your skin will feel hot and dry to the touch. However, in heat stroke brought on by strenuous exercise, you skin may feel moist.

**Nausea and vomiting:** You may feel sick to your stomach or vomit.

**Flushed skin:** Your skin may turn red as your body temperature increases.

**Rapid breathing:** Your breathing may become rapid and shallow.

**Racing heart rate:** Your pulse may significantly increase because heat stress places a tremendous burden on your heart to help cool your body.

**Headache:** Your head may throb.

**Prevention:** The best defense against any heat-related illness is prevention. Keep a close watch on the elderly and infants, people on certain medications, athletes and outdoor workers.

- Don't overexert yourself
- Avoid caffeine, coffee, aerated drinks and alcohol, which can speed up dehydration.<sup>9</sup>
- Drink water every 15 minutes, even if you are not thirsty.
- Rest in shade to cool down.
- Wear a hat and light-colored clothing.<sup>10</sup>
- Juice of *Bilv* (*Aegle marmelos*) in summer acts as a good heat absorbing agent.
- Drink *Amla* juice in summer for maintaining *Pitta* balance.
- Drink Coconut water for dehydration.
- Massage coconut oil on the scalp to normalize the body temperature.
- Have buttermilk 3 times a day

- Consume fruits and vegetables with high water content like lettuce, watermelon, apples, broccoli.
- Avoid any food items that are high in salt, as excess sodium could hamper the regular production of sweat in the body.
- Add healthy sources of protein to your diet, which mainly include nuts, pulses and olive oil. This will steady your blood sugar levels, thereby preventing heat strokes.
- *Munnaka* (dried grapes) soaked in water should be taken as it has high water content and rich in reducing sugar that get absorbed fast into blood.

#### Yoga for preventing heat stroke

- 1) *Sheetali Prayanam*- The practice of *Sheetali* breathing calms the mind, reduces the stress or fight - flight response. It cools the body and mind, the blood pressure is also lowered. The purpose of the *Sheetali* breathing is to reduce the body temperature<sup>11</sup>
- 2) *Shitkari Prayanam*-cools down the body temperature so it is useful in fever, reduce high blood pressure.<sup>12</sup>
- 3) *Chandra Anulom Vilom Prayanam*-It is a cooling breathing practice. The body becomes cool. It lowers the high blood pressure<sup>13</sup>.
- 4) *Chandrabhedhi Prayanam*- reduces body heat<sup>14</sup>

#### First Aid for Heat Stroke<sup>15</sup>

If you suspect that someone has a heat stroke, immediately move the person to an air-conditioned environment -- or at least a cool, shady area -- and remove any unnecessary clothing.

If possible, take the person's core body temperature and initiate first aid to cool it to 101 to 102 degrees Fahrenheit. (If no thermometers are available, don't hesitate to initiate first aid.)

Try these cooling strategies:

- Fan air over the patient while wetting his or her skin with water from a sponge or garden hose.
- Apply ice packs to the patient's armpits, groin, neck, and back. Because these areas are rich with blood vessels close to the skin, cooling them may reduce body temperature.

- **COLD WATER:** It may become necessary to immerse your entire body in cold water or ice water, so that your body temperature can be brought down as quickly as possible. You could do this by sitting in a bathtub filled with cold water for around 5 or 10 minutes. However, make sure that you are assisted by a family member or medical personnel during this time.
- **COOLING BLANKET:** If it is not possible for you to sit in a bath tub, you could wrap a special cooling blanket around yourself, after packing your groin area, neck, chest and back with ice packs
- **EVAPORATION:** This technique is one of the newer ones used by doctors, for bringing down body temperature. Since evaporation leads to cooling, this method can be as effective as soaking in a bathtub. In this process, some cool water will be misted on your skin and warm air will be fanned over your body, so that the water evaporates and the skin gets cooler.
- **CONTROLLING SHIVERING:** It is important to ensure that you do not shiver, as the simple act can raise your body temperature by a great extent. Therefore, in case any of the body-cooling other techniques are causing you to shiver, your doctor may give you a muscle relaxant, which reduces the shivering.
- **REHYDRATE YOUR BODY:** You need to alleviate body temperature internally and externally and therefore, it is important that you drink a lot of water. Drinking extra fluids can help reduce the risks for dehydration.

#### MEDICINAL PLANTS THAT CAN BE USED FOR TREATING HEAT STROKE

- 1) *Narikel (Cocos nucifera)* -Classically it is written in *Susruta*<sup>16</sup> and in *Rajnighantu*<sup>17</sup> that potency of *Narikel* (coconut) is cold and it has *Pitta* reducing property and can be used to treat fever with sensation and excessive thirst according to *Bhavprakasa*<sup>18</sup>. So the coconut water is proven

so effective in preventing heat stroke in summer as it rehydrates the body.

- 2) **Amalaki** (*Phyllanthus embilica*)- classically it is written in *Bhavprakasa*<sup>19</sup> that the potency of *Amalaki* is cold and it has *Pitta* reducing property and it can be used for treating burning sensation and vomiting according to *Raj nighantu*<sup>20</sup>.

Following preparation can be used to treat heatstroke<sup>21</sup>.

- Take 10-20 ml *Amalaki* juice adding 5-10 g *Mishri* for treating vomiting due to Heat stroke.
- 5-10 g *Amla* powder with water can also be taken.

- 3) **Chandan** (*Santalum album*) – Classically it is written in *Dhanvantari nighantu*<sup>22</sup>, *Madanpal nighantu*<sup>23</sup>, *Bhavprakasa nighantu*<sup>24</sup> that potency of *Chandan* is cold and it has *Pitta* reducing property, and it can be used in burning sensation and excessive thirst. It is one of the best cooling medicinal plants. Therefore it can be used in many ways for preventing and treating heat stroke. Following preparation can be used to treat heatstroke<sup>25</sup>.

- For preventing and treating vomiting due to heatstroke one can take 20 ml of *Amla* juice adding 5gram of fine *Chandan* powder in it.
- For treating flushed skin due to heatstroke one can apply paste of 2-4 g of *Chandan* powder in *Giloy* juice on affected skin. This preparation can be taken internally also.
- For reducing the temperature and burning sensation apply *Chandan* paste on body.
- For treating dehydration in heat stroke drink 20-40 ml of coconut water adding 2-4 g of *Chandan* powder in it.

- 4) **Kamal** (*Nelumbo nucifera*)-Classically it is given in *Susruta*<sup>26</sup> that potency of lotus (*Kamal*) is cold and it has *Pitta* reducing property and it can be used for treating burning sensation and excessive thirst according to *Madanpal nighantu*<sup>27</sup>.

Following preparation can be used to treat heatstroke<sup>28</sup>.

- For reducing burning sensation in heat stroke take 1-2 g paste of lotus stamens (*Kamal kesar*) orally or paste of white lotus can be applied on the body.
  - For treating dehydration take 1-2 g of lotus stamens (*kamal kesar*) powder with *Mishri* (sugar).
- 4) **Parpat** (*Fumaria indica*)-Classically it is considered in *Trashnanigrahan kasaya* in *Charak*<sup>29</sup> for treating excessive thirst, and in *Dhanvantari nighantu*<sup>30</sup> it is written that its potency is cold and it has *Pitta* reducing property, so it can be used in burning sensation, fever according to *Dhanvantari* and *Bhavprakasa nighantu*<sup>31</sup>.

Following preparation can be used to treat heatstroke.

- *Shadangapaniye* ( a decoction of *Mustak*, *Parpat*, *Usheer*, *Chandan*, *Udeecheye*, *Nagar*)<sup>32</sup> can be used for excessive thirst and in fever due to heat stroke.

- 6) **Usheer** (*Veteveria zizaniodes*)- in *Charak*<sup>33</sup> *Usheer* is considered best drug for treating burning sensation and skin problems as an external application Its potency is cold and has *Pitta* reducing property and can be used burning sensation, excessive thirst and fever<sup>34</sup>.

Following preparation can be used to treat heatstroke<sup>35</sup>.

- Root paste can be applied externally for reducing burning sensation in heatstroke.
- Drink cold infusion of *Usheer* to treat dehydration.

- 7) **Taruni** (*Rosa centifolia*) it is written in *Bhavprakasa*<sup>36</sup> that the potency of taruni (*Gulab*) is cold and it has *Pitta* reducing property and can be used to subside burning sensation.

- *Gulkand* of rose act as cooling agent.

- 8) **Gambhari** (*Gmelina arborea*) it is written in *Bhavprakasa*<sup>37</sup> that the potency of fruit of *Gambhari* is cold and has a *pita* reducing property and can be used for subsiding burning sensation and excessive thirst.

Following preparation of *Gambhari* can be used to prevent or treat heat stroke<sup>38</sup>.

- Apply paste of leaves of *Gambhari* on forehead to reduce headache, burning sensation.
- Take juice 1 spoon of *Gambhari* fruit three times a day to reduce temperature in fever.

**9) *Trapush* (*Cucumis sativus*)** it is written in *Bhavprakasa*<sup>39</sup> that the potency of *Trapush* (*Kheera*) is cold and according to *Susruta Samhita*<sup>40</sup> also it has a *Pitta* reducing property and it has a high water content so this should be consumed in salads to hydrate the body during summer.

**10) *Yavas* (*Alhagi camelorum*)** it is written in *Bhavprakasa*<sup>41</sup> that the potency of *Yavas* is cold and also according to *Dhanvantari nighantu*<sup>42</sup> it has a *Pitta* reducing property and it can be used for treating excessive thirst, fever. Its 10- 20 ml juice or 50-100 ml cold infusion can be used to treat excessive thirst and fever in heat stroke.

**11) *Duralabha* (*Fagonia cretica*)** it is written in *Bhavprakasa*<sup>43</sup> that the potency of *Duralabha* is cold and also according to *Rajnighantu*<sup>44</sup> it has a *Pitta* reducing property and it can be used for treating excessive thirst, fever, burning sensation and vomiting. Its 50-100 ml cold infusion is used.

**Some effective home remedies which are very simple but very effective during the conditions of heat stroke or heat exhaustion are**<sup>45</sup>

- A juice made of green mango pulp and ripe tamarind should be given to the patient. These are considered to be very good and effective for both the conditions. Also green coconut water is a very good medication in such a condition. This can be taken as much as possible without any harm.
- Roasted raw mango is also an effective remedy for the treatment of heat stroke.
- Plenty of water and liquid foods like juices, glucose water and electrolytes should be taken regularly.
- Even onions are good to guard from heat strokes. Extract the juice of onion and apply behind your ears. Roast an onion in open pan and

add some sugar and cumin seeds to onion. Consume this mixture to prevent from excessive heat. Onions taken in any form will keep away from the heat in summers.

- Plums are also best remedy for excessive heat. Soak some plums in cold water, mash them in the soaked water. The mixture should be drained and the water must be consumed.
- Coriander juice or coriander in any form should be taken in summers. Also chutney prepared from coriander and mint leaves is very effective in keeping the body cool. Juice of basil leaves also acts as a natural sunscreen and guards the skin from excessive heat.
- Butter milk is also considered as one of the best remedy to reduce the increasing heat in the body.
- Dried fenugreek leaves (*Methi*) have the magical touch to cure sunstroke. Take some leaves of fenugreek and soak them in water. After some-time, crush the leaves, add a little honey to the crush and filter. Give this blend to the patient once in every two hours<sup>46</sup>.
- Tamarind Drink-Tamarind is rich in vitamins, minerals and electrolytes. Soak some tamarind in boiling water. Strain it and drink it with a pinch of sugar. This decoction lowers your body temperature. Tamarind juice also acts as a mild laxative and helps in treating stomach disorders.
- *Aam Panna* refreshing drink that doubles up as a health tonic. It is made with raw mangoes and spices that cool your body. This drink should be consumed at least two to three times in a day<sup>47</sup>.

#### **Diet and other regimen**

- It should be taken care that water is taken at frequent intervals during summer. A little salt may be added to it which helps in maintain the balance of salts in the body. Apart from plain water, other liquids like juice of *Amla*, *Bel sharbad*, should also be taken frequently during summers.
- A normal diet is recommended to the patient who is suffering from heat stroke or heat ex-



haustion and hard to digest food should be avoided. Also fried foods should not be given to the patient.

- Vegetables like cucumber (*Kheera*), bottle guard (*Lauki*), tided gourd (*Tauri*), gentleman's toes (*Tinda*), mint (*Pudina*) chutney, coriander

(*Dhaniya*) chutney should be consumed more during summer as these have high water content.

- Fruits like watermelon (*Tarbuj*), muskmelon (*Kharbuja*), mulberry (*Shahtut*) should be consumed more.

**Table 1:** The following Ayurvedic Formulations are good for heat stroke-.<sup>48</sup>

| AYURVEDIC MEDICINES                                  | DOSE   |
|--|--|
| <i>Mahashishir Panak</i>                             | 15ml of <i>Mahashishir Panak</i> is to be given to the patient after every half an hour.   |
| <i>Chandanadi Churna</i> ,<br><i>Ratneshwar Rasa</i> | 200mg of <i>Chandanadi Churna</i> and 100mg of <i>Ratneshwar Rasa</i> is to be taken three times daily with <i>Triphala</i> water. |
| <i>Mritsanjivani Sura</i>                            | 50ml to 60ml should be given only if pulse shows weakness.   |

## DISCUSSION

Symptoms of heat stroke are high blood pressure, nausea, vomiting, rapid breathing, headache, fever and they can be prevented and treated with drugs having cold potency (*Sheet virya*), *Pitta* reducing property, bitter (*Tikt*) and sweet (*Madhura*) taste, light (*Laghu*) and lubrication (*Snigdha*) property and have reducing sugar. And the drugs *Narikel*, *Amalaki*, *Chandan*, *Kamal*, *Parpat*, *Usheer*, *Taruni*, *Gambhari*, *Trapusa*, *Yavas*, *Duralabha* mainly have these property so these drugs are able to subside the heat stroke symptoms.

## CONCLUSION

With the use of herbal drugs and yoga heat stroke can be prevented and treated well in Ayurveda.

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