

Activity and Fitness of Worker is extended in the Summer Season with the help of Solar Jacket.

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ABSTRACT: - *The temperature of Kolkata and its surrounding areas now a days is very hot and is touching about 40° C. Workers those who are engaged in outdoor activity for long hours is badly effected in hot. If they use Solar Jacket during their activity in Summer, then their activity and fitness is extended due to decrease body temperature. The normal human body temperature is also known as normothermia or eutheria depends upon the place in the body at which the measurement is made and the time of day and level of activity of the person. Beside that many of the children those who study in school/college are taught that a normal or healthy temperature for all person under all circumstances are same. But in practically, the body temperature have different in the different places of measurement.*

Rectal of baby measurements or measurements taken directly inside the body cavity are typically higher than oral measurements and oral measurements are some what higher than skin temperature. It is accepted that core body temperature internally 98.6°F. The oral temperature under the tongue measurement is less than 98.2° ± 0.7° F and temperature taken in the other places produce different. But some people think that this temperature is normal a wide range of temperature has been found in healthy people. The life of workers those who works for a long time in Summer, their body temperature become high and due to the temperature, the physical fitness and ability of the worker's body have decreased. But if the workers those who wear Solar Jacket in Summer climate, their body ability somehow have to be increased due to reduced body temperature and also increases physical fitness. Temperature also varies with the change of season during the each year. This pattern is called a circannual rhythm. Studies of seasonal variations have produced inconsistent results. People living in different climate may have different seasonal pattern.

Keywords: - *Temperature, Solar Jacket, Studies in Summer Season and measurements of temperature in different places of the human body.*

I. INTRODUCTION

Body temperature is a measure of the body's ability to generate and get rid of heat. The body is very good at keeping its temperature within narrow, safe range in spite of large variation in temperatures out side the body. When too hot, the blood vessels of the body skin expand to carry the excess heat to the skin's surface. The body may begin to sweat and as the sweat evaporates, it helps cool the body. When the human body are too cold, the blood vessels Contract so that blood flow to the skin of the body is reduced to conserve body heat. Men may start shivering which is an involuntary and rapid contraction of the muscles. This extra muscle activity helps generate more heat. Under these normal conditions, this keeps the human body temperature within a narrow and safe range. The body temperature have to be measured in many locations of the human body - like the armpit, ear, mouth and on the forehead. The Thermometers shall be calibrated in either degrees Celsius or degrees Fahrenheit depending on the custom of the region. The normal body temperature is as an oral temperature of 98.6 °F. The actual human body temperature may be 1°F or more above or below 98°F. So the human body temperature changes 1°F throughout the day depending on how active the men are in day. The human body temperature is very sensitive to hormone level and in case of women workers it may be higher or lower when a woman is ovulating or having her menstrual period.

Consideration of fever:- If the oral temperature above 100°F or ear temperature above 101°F is considered fever. When the rectal temperature of a child is above 104°F is also considered a fever. The fever may occur as a reaction due to:-

- Infection ;
- Medicines – such as antibiotics, narcotics, barbiturates, antihistamines and many other;
- Severe trauma or injury, such as a heat stroke, heat exhaustion or burns;
- Other medical conditions – such as arthritis: hyperthyroidism, and even some cancers: Leukemia and liver and lung cancer.

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If the human body temperature high, what is the result of the working workers in Summer Season ?

Procedure to heat distribute throughout the human body – The human are homeotherms, maintaining an average core – temperature of 98.6°F ±1°F. Core temperature varies slightly due to environmental and metabolic factors. The human is susceptible to heatstroke or hypothermia both of which are life threatening conditions, while core temperature is tightly equated skin temperature varies greatly in response to metabolism and the environment. The temperature receptors in the skin whether cold or hot detect these changes, initiating compensating mechanisms through central Nervous system. The heatstroke occurs when the body fails to regulate its own temperature and body temperature continues to rise.

Classic heatstroke can develop without exertion when a person is exposed to a hot environment and the body is unable to cool itself effectively. In such case the body's ability to sweat and transfer the heat to the environment is reduced. The sweating may be stopped in this case. Classic heatstroke may develop over several days. In this type of heatstroke may be developed for babies, older aged and those who have chronic health problems have greatest risk.

Exertional heatstroke shall be occurred while worker is working in a hot Summer/ environment.

The above mentioned two types of heatstroke cause severe dehydration and can stop human body organs function. Heatstroke is a life – threatening medical emergency requiring emergency medical treatment.

The use of Solar jacket can stop these above two types of heatstroke and it had already researched by our Laboratory recently. The temperature receptors in the skin whether cold or hot detect these changes initiating compensatory mechanisms through central nervous system.

Description of Solar – Jacket:- The Solar Jacket consist of Four Solar Cells at the back side of the Jacket and there are 12 Nos. 1.2V, 3000mAh Nickel-Metal Hydride, Rechargeable Battery are fixed inside of the pocket of the Cloth Jacket and it is very low weight. Inside of the Jacket two mini D.C. Brushless, 12V,0.18A Fan and Two mini of the same fan are as exhaust Fan. One number D.C. Charger- Input – 5V to 24 V and its Out put – 6V, 0.07 A is used to charge the Battery. When Solar Cells activated, the mini fans are started to function. The wind starts to circulate inside the jacket and feel cool as the sweat evaporates due to that function of the mini fans. Again, two small exhaust fans also are placed inside of the said jacket. The function of two exhaust fans are to reduce the inside temperature of the jacket. The worker will feel at least 2 to 3 degrees cooler than the outside temperature.

Experiential Results

Date: 17.04.2014 Duration: ½ hour Environment Temperature= 44 °C Room Temperature=37°C												
Field of Application	Sl No.	Name of The person	Age	Height	Weight	Slim/ Fatty body	Blood Pressure		Pulse Rate		Body Temperature	
							Before Use	After Use	Before Use	After Use	Before Use	After Use
Agriculture worker	1	Uttam Pandit	26	5'3.5"	45.5Kg	Slim	130/72	110/62	80	68	98°C	98°C
	2	Nanda Hazra	30	5'2"	45Kg	Slim	109/69	102/66	78	68	99°C	98.1°C
	3	Megnat h Dhere	45	5'4.5"	69Kg	Fatty	99/64	97/59	70	71	98°C	98.2°C
Date: 24.04.2014 Duration: 1½ hour Environment Temperature= 37°C Room Temperature=32°C												
Security Guard	1	Hara Prasad Dinda	24	5'7"	58Kg	Slim	136/86	139/83	79	69	98°C	97.2°C
	2	Sanjay Sarma	45	5'7"	60Kg	Fatty	136/86	134/80	80	70	98°C	97.2°C
	3	Rakesh Das	29	5'7"	60Kg	slim	136/86	139/83	79	69	98°C	97.2°C
Date: 26.04.2014 Duration: 2 hour Environment Temperature= 38°C Room Temperature=33°C												
Security Guard	1	Hara Prasad Dinda	24	5'7"	58Kg	Slim	136/86	139/83	79	69	98°C	97.2°C
	2	Sanjay Sarma	45	5'7"	60Kg	Fatty	135/85	133/80	79	70	98°C	97.2°C
	3	Rakesh Das	29	5'7"	60Kg	slim	135/85	133/83	79	69	98°C	97.2°C

Table. – 1

The Experiential Results are shown in the Table – 1



Fig. - 1

Fig. - 2

Fig. - 3

Fig. - 1 Font side of the Jacket with 2 Nos. Exhaust Fans and 1 No. D.C. Charger.

Fig. - 2 Inside of the Jacket with 2 Nos. Mini Fans and 2 Nos. Exhaust Fans.

Fig. - 3 Back side of the Solar Jacket with 4 Nos. Solar Cells and 2 Nos. of Exhaust fans are shown.

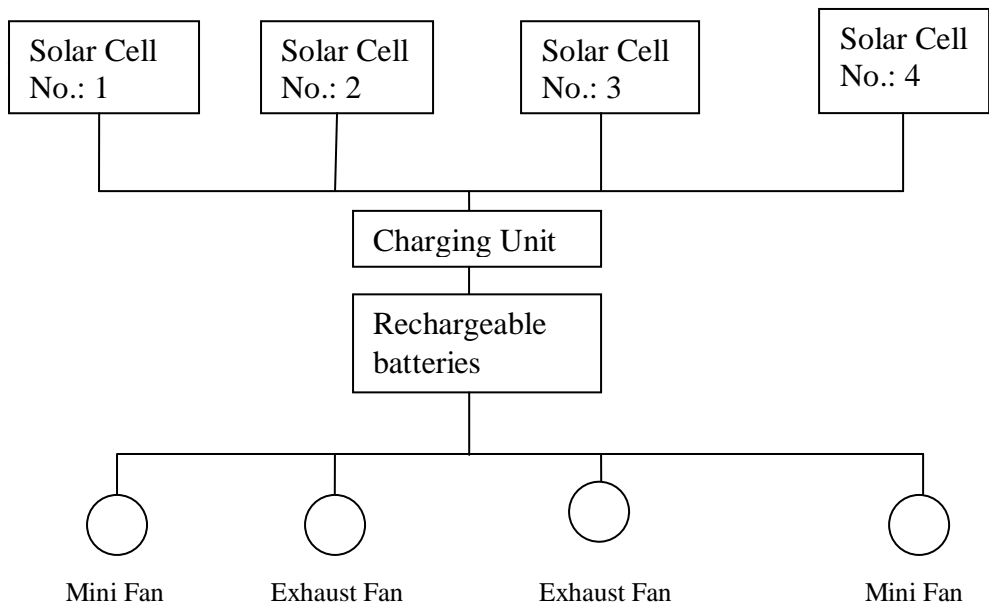


Fig. - 4

The single line Circuit diagram of the Solar system is placed inside of Jacket shown in the Fig. - 4

The structure and chemical composition of the human cell is such that a voltage difference exists between compounds inside and outside the cell. Again, it can say, the cell is composed of some compounds are electrically conductive and will cause a momentary current to flow, when the cell is stimulated. Stimulation includes electrical, Chemical as well as changes in temperature. Due to the action of this process the variation of body temperature of the worker those who works in hot condition in the summer Season and in the factory wherein the boiler, furnace etc. so, the Solar Jacket along with Solar Cap can help well to that workers positively.

Case Studies :-

For Agriculture Workers.

Case -1

Sri Uttam Pandit – Agriculture worker, 26 Years, Slim body, 5’-3.5’’ height, 45.5 Kg. weight. It is observed from experimental result that his blood pressure, pulse rate are reduced after used of Solar Jacket, but his body temperature remain same as before used of Solar Jacket. Sri Pandit told that he feels cool and also feel comfort for working in the Summer Season.

Case – 2

Sri Nanda Hazra - Agriculture worker, 30 Years, Slim body, 5’-2’’ height, 45Kg. weight. It is observed that his blood pressure and his pulse rate is reduced, but body temperature slightly is increased. During wearing the Solar Jacket he feels cool and also feel comfort and his intensity for working increases.

Case – 3

Sri Megnath Dhere - Agriculture worker, 30 Years, fatty body, 5’-4.5’’ height, 69Kg. weight. It is observed from the experiment chart that his blood pressure is decreased, but his pulse rate and his temperature are increased slightly. After proper investigation it has been found that his hart condition is abnormal as per Pathological report.

Case Study for Security Guard.

Case – 1

Sri Hara Prasad Dinda – Security Guard, 24 years, Slim body, 5’-7’’ height, 58Kg. weight. It is observed from experiment chart that his pulse rate and body temperature are reduced, but blood pressure is increased due to his hypertension and other metabolic factors. During wearing the Solar Jacket he feels cool and also feels comfort

Case – 2

Sri Sanjay Sharma - Security Guard, 45 years, Fatty body, 5’-7’’ height, 60Kg. weight. It is observed from experiment chart that his pulse rate and body temperature are reduced, blood pressure is also decreased. During wearing the Solar Jacket he feels cool and also feels comfort

Case – 3

Sri Rakesh Das – Security worker, 29 years, medium body, 5’-4.5’’ height, 60 Kg. weight. It is seen from the experiment Results that his blood pressure , pulse rate and body temperature also decreased. After 15 minutes he feels cool and comfort than normal. As per statement of Sri Das that he feels cool like Air-Conditioner. They have no problem to work with it.

DISCUSSION

It is a new area of Research work in our state and also in the country. In this particular area I have not seen the wide range of research done by other Researcher till the date, but have more potentiality It can help to increase the activity and fitness of the workers those who has been working in hot places in open air in Summer Season and also in the factory around the furnace , boiler wherein glass articles are produced like electric Bubbles, Tubes and Glass container etc. At present it is not possible to cover all areas of Solar Jacket activity, but I will try to work in this field, if I get opportunity in future.

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