Remission1°C High Frequency Hyperthermia-inducing Device

Introduction

REMISSION1°C (MODEL: RAH-HCE) is a high frequency hyperthermia equipment. The working principle through application of high frequency electric energy into the body, the frictional heat is generated by the molecular movements such as their rotation, friction, twist, or collision.

The electrical frequency-inducing heat device Remission1°C functions through generation of electrical frequency of 0.46MHz delivers deep heating into localised or targeted body region.

Advantages

The heating process intended for relief of pain, inflammation and tissue healing. Unlike other electrical heating inducement, heat generated by Remission1°C from molecular movement as high frequency electricity passes through the molecules in the body without affecting sensory and motor nerves in the body, which usually caused muscular contraction or any discomfort.

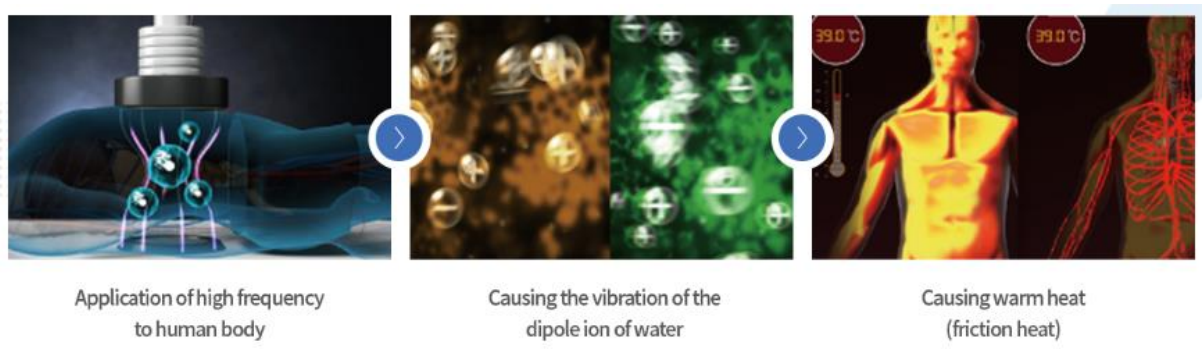


Figure 1 illustrates the mode of mechanism of Remission1°C in stimulating deep heating. During application, electricity travels through two electrodes across the human body, causing vibration of ions within organs. The vibration between molecules result in frictions and subsequently producing heat energy as a result of energy transformation due to friction heat (Retrieved from http://en.adipo.co.kr/sub.php?sb_table=remission).

Principles of Operation

When the high frequency current outputted from the device is transmitted into the human body through the electrode, the forward and backward motion of the ions and the rotation motions of the dipole molecules occur, and these movements are converted into bio-thermal heat in the tissue.

When the applicator is positive and the plate is negative, the -ion is moved to the applicator and the +ion moves to the plate because the attractive force acts between the other polarities and the repulsive force acts between the same polarity. When such a polarity is changed periodically, ions and dipole molecules in the body vibrate and eventually the vibration is converted into heat energy by friction to warm the treatment area.

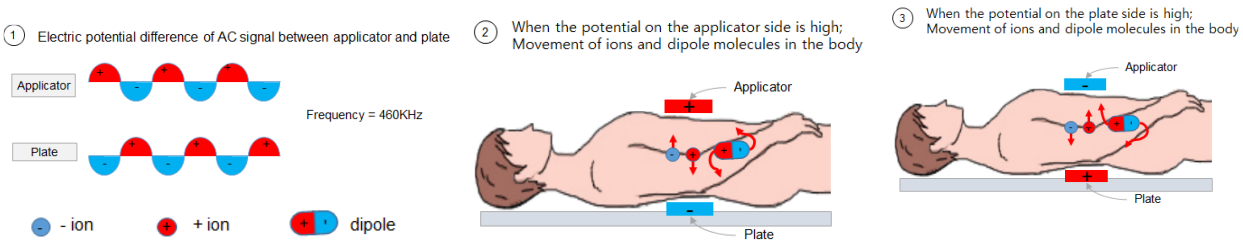
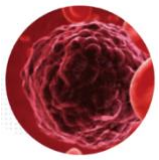


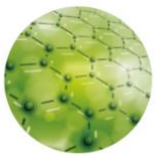
Figure 2 illustrated the step by generation of electrical energy into multi-directional molecular motions, which subsequently converted into biothermal in locally targeted region.

Novelty

Remission1°C stands out as in developing the first advanced cancer treatment equipment which take high-frequency into human body by 460,000 times per second (0.46Mhz) to increase temperature deep within organs. The new and efficient treatment generates heating by molecular movements, stimulate heat-sensitive cells such as cancer cells to initiate self-disintegration. Heat-inducing treatment could be divided into two therapeutic mechanisms (Hurtwitz, 2019); via heat treatment and another via immunity treatment.



Heating treatment when 50 minutes pass at 42.5°C, in normal cells, the vein expands, dispersing heat to neighbouring cells, and often prone to tumorigenic cells at the applied region. As tumour cells are more susceptible to high temperature due to its inability to disperse heat hence resulting in weakening of cells and reduced viability (Hegyi G et al., 2013).



In terms of immunity treatment, increment of 1°C in body temperature could proportionally strengthen the immune system, therefore reinforced immune effector cells against cancer cells resulting in cell death and effectively preventing reoccurrence and metastasis (Hurwitz, 2019).

Hyperthermia treatment had shown increase effect in treating metastasis or last stage patients even when anti-cancer drugs and radiation treatment is difficult in various case studies (Bettaieb A et al., 2013; Hurtwiz, 2019). Previous case studies (Ryu et al., 2017; Liu, 2019; Perez et al., 1986) have shown that the treatment method using hyperthermia is relatively safe without side effects or complications such as vomiting, cold, less appetite, disability to digest or complication of numb limbs.

Targeted therapeutics

Ongoing clinical trials will be investigating the application of Remission1°C through hyperthermia treatment on cancer malignancy indications. Studies have shown that treatment of hyperthermia could improve blood circulation, reduced viability of cancer cells and strengthen immunity (Bettaieb A et al., 2013; Hurtwiz, 2019). Cancer cells are more susceptible to heat which lead to damage and apoptosis in comparison to healthy cells as this may be caused by their differential expression of heat shock proteins (HSPS) and other proteins involved in cellular defence against antigenic stressors such as heat shock (Bettaieb A et al., 2013).

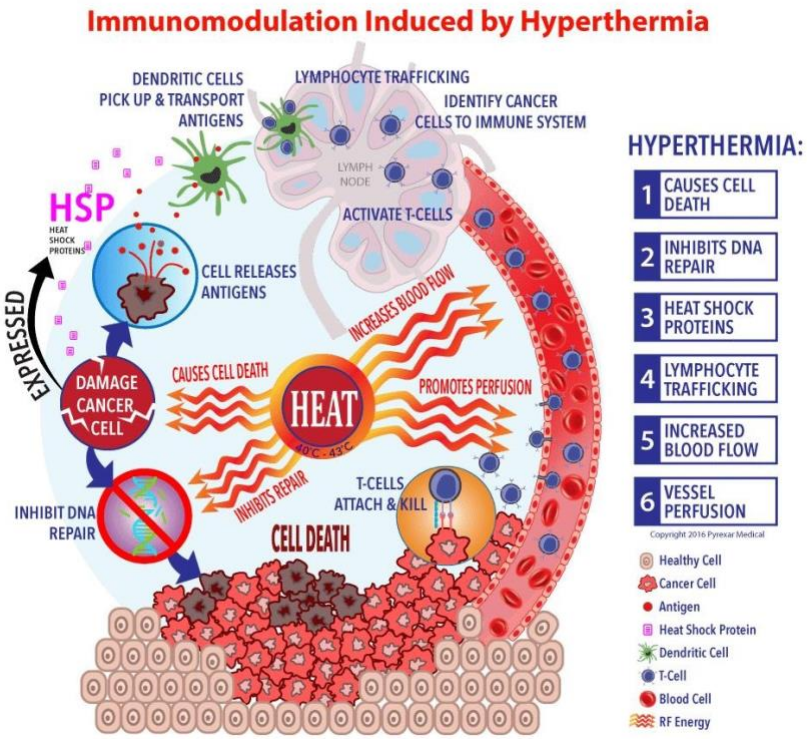


Figure 2 Diagram illustrated the immunomodulatory mechanism stimulated by hyperthermia in tissues (Hurtwitz, 2019).

Stable deep heating technology shown a higher relativity in preventing proliferation rate of cancer cells, and survival rate of cancer patients receiving heat treatment when compared to those who did not receive the treatment (Harima et al., 2001). Hyperthermia in treating cancer had shown to increase effectiveness in metastatic or recurrence tumour patients even when chemotherapy and radiation treatment is difficult to achieve (Gonzalez et al., 1988; Yang et al., 2019).

As for patients who are using deep heating as concurrent treatment, it could reduce heavy reliant on anticancer drugs and amount of radiation treatments. Moreover, it could improve the quality of life through pain alleviation and reduce tumour size (Ryu et al., 2017; Hurwitz, 2019; van der Zee, 1988).

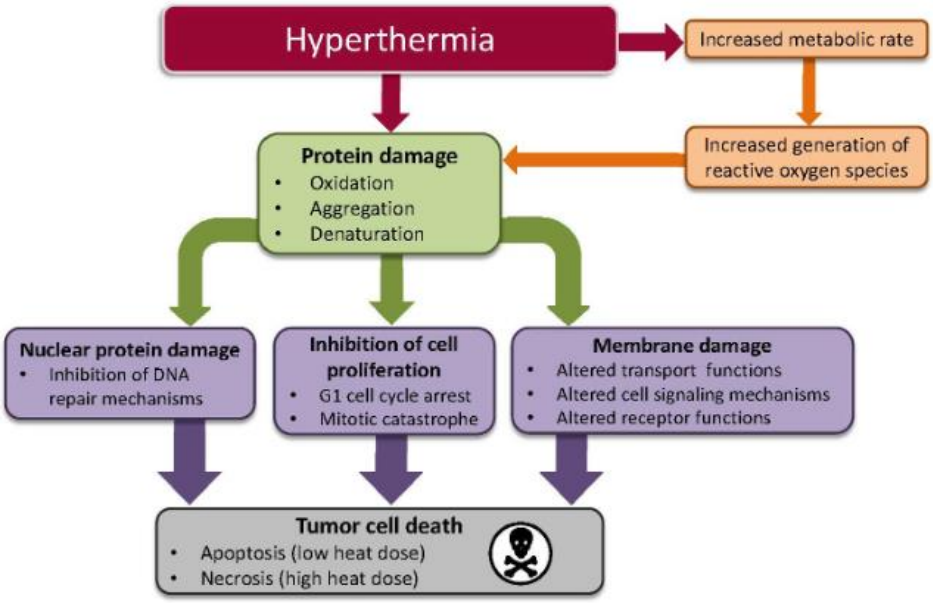


Figure 3 Diagram illustrated the overview function of hyperthermia on cancer cells. The following mainly targets tumorigenic cells as cancer cells are more prone to heat shock induced by hyperthermia treatment (Bettaieb A et al., 2013).

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