



ISSN: 2456-0057  
 IJPNPE 2017; 2(1): 266-269  
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 www.journalofsports.com  
 Received: 15-11-2016  
 Accepted: 16-12-2016

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## Conundrum of life and innate heat

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### Abstract

Innate heat/vital heat is also known as hararat-e- Ghariziyah in Unani system of Medicine. It is well known fact that the innate heat acquired by external sources such as element of Fire at the time of conception and fertilization when the gonadal/seminal fluid of male and female unite, and then maintain by the atmospheric air and nutriment throughout the life. The relation between innate heat and human body and its physiological functions and observations can define with the understanding of ancestor's logic of relation of life with heat and cold with dead, for this reason every animate thing has heat. Aristotle stated in his famous book 'De anima' all food must be capable of being digested and heat causes digestion [1].

**Keywords:** Innate heat, Life, Hararat-e- Ghariziyah, Unani medicine

### 1. Introduction

Science is the study of nature, and by extension, the study of man. So the study may be Positivist or Transcendentalist. Positivist concern with modern medicine and they limit the study to the physical level and that there is nothing more to be studied beyond sensory and quantifying method namely physical. While, transcendentalist includes supra physical level up to varying extent. Unani system of medicine is manifested by physical, subtle and spiritual apparent and is an evidence based medicine which deals with preservation of human health and nullification of diseases. The postulation of this medicine is purely on human body and his life in respect of health and disease. Though, the health inheres naturally not put in artificially [2-5]. Before knowing about health and disease it is necessary to know about the Life.

#### 1.1 About Life

According to Terry Eagleton "there is fairly standard reason why some thinkers regard the meaning of life question as being itself meaningless this the case that meaning is a matter of language, not object and object can be define in many ways [6].

Life in the view of Ahmad Bin Tabari, "in animates life can be define as a mechanism which protects kaifiyat (Qualities) from different physiological changes and transformations which occurs in that body. Respiration and response to stimuli are the specific features of life [2].

Mohd Bin Yousuf Harvi believe that, "Life is a property necessitates with movements and different senses. These movements occur due to innate heat and all functions which are necessary to the body derived by innate heat [8].

There is no unequivocal definition of life; most current definitions in biology are descriptive. Life is considered a characteristic of something that exhibits all or most of the following qualities.

**Tarkeeb (structure):** Being structurally composed of one or more simple organs the basic units of life.

**Mizaj (constitution):** Maintain the natural state of the body means health; i.e. nutriments to replenish the loss.

**Istehala (metabolism):** Energy produced during different metabolic activities in the body and living things necessitate energy to maintain internal environment (homeostasis) and to produce some important substances which are associated with life.

**Growth:** A growing organism increases in size in all of its parts, rather than simply accumulating matter.

**Response to stimuli:** A response is often expressed by motion; for example, the leaves of a plant turning toward the sun.

**Reproduction:** The ability to produce new individual, either asexually from a single parent, or sexually from two parents [9].

## 2. Concept of Innate heat

Heat (energy) is the most essential thing for living beings, James Jean described the relation between life and heat in his famous book "The Mysterious Universe" He said "Life of the kind we know on earth could only originate on planet like earth it needs suitable physical conditions for appearance, the most important of which is a temperature at which substances can exist in the liquid state<sup>7</sup>. In Unani system of medicine this energy defines as a *harart-e- Gharizia* (Innate heat). Which is considered essential for Life, it is assumed that all body functions are maintained by different Capacities/Faculties of the body and these capacities are dependent on Innate heat, any deviation in this heat from its normalcy and moderation the body functions get disturbed and extreme deviation of Innate heat from normalcy is thought to be cause of death [5, 8].

## 3. Literature review

Innate heat has been defined by various ancient scholars in different ways but as per its reality there are two main schools of thought. According to *Jalinoos*, *Zakaria Razi* and *Ali Ibn Abbas Majoosi*: innate heat is actually heat of Fire element that is produced while attaining *Mizaj* (Temperament) and is responsible for body's consistency and remains in the body throughout the life [8, 10].

But *Shaikhur Rais Ibn Sina* and his followers have defined innate heat as a kind of heavenly heat which is gifted by God along with *nafs* at the time of Zygote formation [12].

According to *Yusuf Harwi*, it is that heat which is present in the body and is responsible for keeping the body live or is responsible for maintaining the *surat* (specific form) of the body [8, 19]. This heat helps in accomplishment of all those functions of the body which are responsible for the maintenance of life e.g. absorption, digestion and assimilation of useful entity and expulsion of waste from the body and all other physiological functions.

The innate heat is found in the body since birth. With reference to Aristotle, *Rabban Tabari* says that heart is the source of innate heat. It reaches from heart to various body organs through arteries [5]. Being in equilibrium it maintains the life. Since the existence and maintenance of life is by *Arwah* (Pneuma) And preservation and maintenance of *Arwah* is by moderation of innate heat which in turn occurs by respiration, food and drinks [10, 20].

Through eatables, drinks and respiration, in form of nutriment and air the elemental substance enter our body and remain inside organs in the form of matter and *Akhlat* (humours) [1]. Within these matter and *Akhlat*, various metabolic processes and interactions occur which result in formation of different

products and bi-products. These metabolic processes and stages are referred by various names like *hazm* (digestion), *nuzj* (concoction) etc. These processes not only occur in the digestive system but also inside each and every organ. Therefore within each organ various complex mechanisms of *istehala* (transformation) or *kaun-wa-fasad* (genesis and destruction) operate. These processes lead to formation of numerous products. Besides, this is a well known fact that this *istehala* *kaun-wa-fasad* are invariably accompanied by production of heat [1, 3]. This means that in each and every organ of the body these above mentioned processes which occur continuously result in continuous production of heat. Until the production of this heat occurs in moderation the organs remain temperamentally balanced, this heat is conducive to bodily functions. And it is this heat which is known as innate heat [12].

This innate heat is associated with a substance known as *Rutubate ghariziya* (innate fluid) which every individual receive in life by his parents at the time of conception [11].

It is an established fact that human body is formed from the union of seminal/Gonadal fluid of male and female. Seminal fluid of male is considered as active while that of female is passive. *Ajzae ardhiya* (constituents of earth) and *ajzae maiya* (constituents of water) are comparatively more in seminal fluid of female whereas *ajzae nariya* and *ajzae hawaiiya* are dominant in seminal fluid of males. Although after interaction formed zygote is moist, this has heat associated with it [11, 12].

This innate fluid is acted upon by innate heat to formulate human body and all body organs up to the optimum level and facilitate those functions which are necessary for the body like it provide nutrition to it and expels its waste etc. [12] So the dissolution of this fluid gradually occurs from birth to death.

Since innate fluid is substance of innate heat and if it keeps on undergoing the process of dissolution due to routine activities of life then it will come to an end or it will get dissolute completely<sup>18</sup> because the fluid is bestowed in limited amount it can be better understand with a suitable example given by ancient philosopher that, Innate fluid is like the oil in the lamp and innate heat is like flame of lamp and the flame lives by consuming the oil and will eventually consume it entirely. Once the innate fluid vanishes, innate heat would be quenched and the person would die [15].

Although the amount of innate fluid alone is not sufficient to sustain life for more than few weeks<sup>12</sup> so to sustain life for a definite period innate fluid gets support from humours which formed by food and drinks consumed. There are little difference between humours and innate fluid as per Unani concept humours simply formed in liver by nutriment and supplied by heart and arteries to the organs for their supplement and nutrition whereas Innate fluid is a mixture of seminal fluids of both parents it means Maturation of innate fluid occurs first in alimentary canal followed by reproductive canals of male and female and lastly in the body of new born [18]. While humours produce from consumed food and drinks do not go through this long process. Hence it becomes clear that innate fluid is different from the fluid produces after digestion of food and drinks which are consumed. That is why innate fluid cannot be replenished however its dissolution only can be minimized by providing support through maintaining balance in food and drink and physical activities. But a small amount of innate fluid is getting dissolute daily along with Body fluids so there comes a time when whole of innate fluid dissolute resulting in quenching/extinguishing of Innate heat. This very process of complete dissolution of the

fluid causing quenching of innate heat is referred to as natural death. And gradually fall in amount of innate heat with time can be referred as ageing process and this fall is a main cause of weakness of body organs and trouble in their normal functions because there is always need of a optimum temperature in the organs for their normal functioning but when the amount of innate fluid becomes below the normal then the optimum temperature means innate heat also decrease and this is the main cause of weakness of body organs after the age of 40-45 years.

*Abbas Majoosi* in his famous book *Kamil-us- Sina* has mentioned that Blood is the material for production of innate heat most preferentially depends on the respiration and followed by nutriment<sup>[10]</sup> and it can be understood by metabolism and cellular respiration.

#### 4. Modern Concept

Foodstuffs are mainly composed of carbohydrate, protein and fat which when taken oxidized in the cells and during this process, large amount of energy is released in form of heat. The physiologic processes of the cells is needed energy (in form of ATP) to cause mechanical movement in the case of muscle function, to concentrate solute in case of glandular secretion and to effect other functions. ATP is present everywhere in cytoplasm and nucleoplasm of all cells and essentially all the physiologic mechanisms that require energy for operation obtain it directly from it. This is why ATP is known as energy currency of the cells. ATP is an energy rich molecule because its triphosphate unit contains two phosphoanhydride bonds. A large amount of free energy is liberated when ATP is hydrolysed to ADP and orthophosphate (Pi) or when ATP is hydrolyzed to AMP and Pyrophosphate (PPi). This ATP-ADP cycle is fundamental mode of energy exchange in the biological systems<sup>[13]</sup>.

If any of these macromolecules like glucose, fatty acids and amino acids is decomposed all at once large amount of energy wasted in the form of heat, fortunately these macromolecules undergo a stepwise decomposition resulting release of energy in small packets to form one molecule of ATP<sup>[14]</sup>.

Hans Krebs described three stages in generation of energy from the oxidation of foodstuffs<sup>[13]</sup>.

In the first stage large molecule in food are broken down into smaller units. This process is digestion. Proteins are hydrolyzed into amino acids, polysaccharides are hydrolyzed into simple sugars and fats are hydrolyzed into fatty acids and glycerols.

In second stage, these numerous small molecules are degraded into a few simple units that play a central role in metabolism. In fact most of them-sugars, fatty acids and glycerol's and several amino acids are converted into acetyl unit of acetyl CoA. Some ATP is generated in this stage.

In third stage ATP is produced from complete oxidation of the acetyl unit of acetyl CoA. The third stage is consists of Krebs cycle and oxidative phosphorylation, which are final common pathway in oxidation of fuel molecules<sup>[13]</sup>.

For example complete oxidation of one gram molecule of glucose releases 686000 calories of energy and only 12000 calories of energy are required to form one gram molecule of ATP energy would be wasted if glucose were decomposed all at once into H<sub>2</sub>O and CO<sub>2</sub> while forming a single ATP molecule. Fortunately stepwise split (glycolysis, Krebs cycle and electron transport system) of glucose occurs, forming a total of 38 moles of ATP for each mole of glucose metabolized by cells. In glycolytic process a net gain of two moles of ATP occurs for each mole of glucose utilized. The

efficiency of this process is that, only 43% of energy is utilized in formation of ATP while remaining 57% of the energy is lost in form of heat. Similarly in Krebs cycle one molecule of ATP is formed. However, because each glucose molecule splits into two pyruvic acid molecules, there are two revolutions of the cycle for each molecule of glucose metabolized, giving a net production of two molecules of ATP. During entire process of glucose breakdown, a total of 24 hydrogen atoms are released during glycolysis and during the citric acid cycle. Twenty of these atoms are oxidized in conjunction with the chemiosmotic mechanism with the release of three ATP molecules per two atoms of hydrogen metabolized. This gives an additional 30 ATP molecules.

The remaining four hydrogen atoms are released by their dehydrogenase into the chemiosmotic oxidative process in the mitochondrion beyond the first stage. Two ATP molecules are usually released for every two hydrogen atoms oxidized, thus giving a total of four more ATP molecules.

Now adding all the ATP molecules formed, we find a maximum of 38 ATP molecules formed for each molecule of glucose degraded to carbon dioxide and water. Thus 4, 56,000 calories of energy can be stored in the form of ATP, whereas 6, 86,000 calories are released during the complete oxidation of each gram molecules of glucose. This represents an overall maximum efficiency of energy transfer of 66 per cent. The remaining 34 per cent of the energy becomes heat and, therefore, cannot be used by the cells to perform specific functions. Although this heat released in metabolic processes helps to maintain body heat. This process explains the statement of *Ali Abbas Majoosi*.

#### 5. Conclusion

Innate heat either *Rukni* or God gifted and acquired at the time of fertilization with *rutubate Gharizia* (innate fluid). This fluid act as a stuff for innate heat and both are responsible to generate simple and compound organs and bestows a complete Temperamental shape to the body. Afterwards helps the *Tabiyat* and other faculties to perform all Body functions i.e. Nutrition, dissolution and replenishment<sup>[16, 17]</sup> etc. The very little amount of the innate fluid continuously loss during body functions day by day causes diminished the Innate heat, this is a elemental or temperamental heat so reduction may lead to *su-e- Mizaj* (abnormal temperament) at organ level so the faculties of that particular organ come about weak and ultimately functions are disturbed. After a particular time when the innate fluid vanishes innate heat extinguished and the person would die, this is the concept of natural Death in Unani System of Medicine.

**6. Acknowledgement:** This work is completed in dept. of Kulliyat with the support of Library of National Institute of Unani Medicine, Bengaluru Karnataka.

**7. Financial support:** Nil

**8. Competing interests:** The author declares that there is no conflict of interests

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