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UNANI CONCEPT OF PHYSIOLOGICAL CHANGES OF AGEING

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ABSTRACT

The prospect of ageing has occupied the minds of physicians, philosophers and poets for centuries. Aristotle penned a theory of ageing based on the loss of heat while Hippocrates described common conditions found in later life. Modern theories about physiological changes include genetically-determined life span encoded in specific genes, deprivation and deficiency of important nutrients and oxygen, wear and tear of important organs by continuous functioning, loss of important genetic material during DNA repair, accumulation of free radicals and damage of intracellular structures, accumulation of stress over life time with its resultant effect etc. Unani medicine describes the concept of *Tabiyat*, which is a best planner of the body to create the healthy environment within the body and prepare to combat against the disease. It is defined as the sum total of structural, functional and psychological character of the human being. Since *quwwat* is not eternal, it decreases gradually with age. *Tabiyat* is also a *quwwat* that reins all *quwa* and their functions thus maintains homeostasis, with advancing age *hararate ghareezia* decreases resulting in relative *baroodat* in *mizaj*, *baroodat* weakens the *quwa* ultimately weaken the functions because *quwa* requires *hararat* for performing *afaal*. *Tabiyat* also weakens with increase in *baroodat*. As the *tabiyat* is superlative controller of all functions of the body whenever it becomes weak, it alters all functions of the body. Thus in Unani system of medicine the concept of physiological changes depends on three main factors- change of *mizaj* to *barid yabis*, weakness in *tabiyat* and decline in *quwa wa affal*.

INTRODUCTION

Ageing, in the sense of senescence, is a progressive loss of adaptability of an individual organism as time passes. As we grow older we become less able to react adaptively to challenges from the external or internal environment. External challenges include injury and infection, and among challenges from the internal environment are arterial occlusion and malignant cell clones. As homeostatic mechanisms become less sensitive, less accurate, slower, and less well sustained, sooner or later we encounter a challenge that we are unable to deal with effectively and we die. Therefore the rise of death rate with age is the hallmark of senescence.¹ It is uncertain as to why we age. Despite being a universal phenomenon, the exact mechanism or sequence of events are not yet definitively known. Some of the established theories are as; genetically-determined life span encoded in specific genes, somatic mutation of genes, deprivation and deficiency of important nutrients and oxygen, wear and tear of important organs by continuous functioning, cross linkage of important cellular components, accumulation of toxic materials, e.g. lipofuscin, cholesterol, accumulation of free radicals and damage of intracellular structures, loss of important genetic material during DNA repair, impaired DNA repair due to deficiency of key enzymes, non-enzymatic glycosylation of proteins, growth hormone deficiency, and accumulation of stress over life time with its resultant effect.² The biological changes of ageing are clear but the mechanisms that mediate them are not. Various contradictory theories exist in this regard as mentioned above but there is a consensus that the mechanisms for ageing are multifactorial, despite the biological controversy, from a physiologic standpoint human ageing is characterized by progressive constriction of the homeostatic reserve of every organ system. This decline referred to, as homeostenosis is gradual and progressive and is influenced by *tabiyat*, diet, environment, *mizaj*, *affal* and personal habits according to classical Unani literature.³ According to the Unani physicians, entire span of life consists of four stages based mainly on *Rutoobate Ghareeziya* and *Hararate Ghareeziya* present in the body. These stages are jointly known as *Asnane Arbaa*. i.e Sinne Numoo (growing age), Sinne Shabab (adult age), Sinne Kuhoolat (middle age) and Sinne Shaikhookhat (old age). **Sinne Shaikhookhat**, the age after 60 years till death. *Mizaj* is *Barid Yabis* (extremely). During this stage, quantity of

the *Rutoobate Ghareeziya* is deficient and lesser than the quantity required for the preservation of *Hararate Ghareeziya*. There is also dominance of *Rutoobate Ghareeba*. In this period, there is an insidious decline in organ functions.^{4, 5, 6}

METHODS

All the classical as well as modern books related ageing were searched in NIUM library for literature review. Internet services were also used to gather information regarding physiological changes of ageing in Unani and modern system of medicines respectively from various books and published papers.

MIZAJ (TEMPERAMENT), TABIYAT (PHYSIS), QUWA WA AFFAL AND PHYSIOLOGICAL CHANGES WITH AGE

Mizaj indicates the properties of an *unsur* (atom), a molecule, a cell, a tissue, an organ and of the organisms as a whole. Each and every *unsur* (atom), molecule (*murakab*), *khilt* (humour), organelle, cell, organ and body as a whole is furnished with a *mizaj* (equilibrium) upon which their properties, functions and life depends.

Mizaj indicates the state of equilibrium in a compound with respect to required number of atoms and molecules of different elements and their ratio to that particular compound and the state of homeostasis in a cell (*ratoobat ustaqussiah*), or in the entire body (*ratoobat tajawif*) upon which depends the life of the cell and the entire organism. Thus each of the above, tissue, organ and the entire body is bestowed upon with the *mizaj* (homeostasis) which is known as *mizaj moatadil tibbi* (normal temperament). Since each cell, tissue, organ and the entire body is bestowed upon with a power, *tabiyat* and in turn *tabiyat* maintains the *aetadal mizaj* (homeostasis) through thousands of controlling systems and mechanisms for the preservation of individual as well as his species, which operate under *quwwat tabiyah*, *quwwat haywaniyah* and *quwwat nafsania*. Some of these mechanisms operate within the cells to control intracellular functions (*al- istehalat al- uzwiyyah*), others operate through the entire body to control the inter relationship between different organs. Thus, each functional structure under the guidance of *tabiyat* provides its share in the maintenance of *moatadil mizaj* (homeostasis) in the internal environment (*milieu interior*). As long as the normal *mizaj* is maintained i.e equilibrium in the *kammiyat* (quantity) and *kaifiyat* (quality) of *akhlat* is maintained the cells of the body

will continue to live and function properly. Thus, each cell benefits from *aetidale mizaj* (homeostasis) and in turn each contributes its share towards maintenance to this *mizaj*.⁶

This harmonious relationship is controlled by the *tabiyat* until one or more functional systems lose their ability. This is what happened after the sixth decade of life (*sine shakhookhat*). In old age this harmonious relationship got damaged due to the following reasons;

- (i) Change of *mizaj* to Barid Yabis
- (ii) Weakness in *tabiyat*
- (iii) Decline in *quwa wa affal*.

Al – Abbas at various places of his text, has vividly explained the functions of *tabiyat* in dealing with physiological functions as well as functions of *tabiyat* under various pathological conditions.⁷

Thus it is evident that *tabiyat* functions in following two ways;

- (i) In physiological condition it maintains the *mizaj* (homeostasis) in the body for the proper functioning of the cells, tissues and organs.
- (ii) In case body becomes diseased, i.e, *su al mizaj* or derangement in temperament takes place, *tabiyat* fights against the disease and appropriate condition of *etadal al mizaj* (homeostasis) is regained and ultimately the patient is cured.

It is this *tabiyat* that gets weakened due to ageing, hence the proper functions of the cells, tissues, organs and ultimately of the various systems of the body are declined which in turn poses elderly to various signs and symptoms of age associated diseases and disorders.⁸

Tabiyat, *mizaj* and *quwa wa affal* are all interrelated. They forms a vicious cycle and function in collaboration with one another. Any change in *mizaj*, *quwa wa affal* or *tabiyat* leads to derangements in various systems of the body.⁹ In *sin –al – shakhookhat* (old age), the quantity of *ratoobat ghariziyah* required for the preservation of *harate ghariziyah* and to continue the bodily normal metabolism is super added with and dominated by *ratoobat gharibah ballah* (abnormal metabolic products). This changes the *mizaj* of the elderly individuals to relatively *Barid Yabis*. Gradual increase in *baroodat* with age results in marked deterioration in powers and faculties of the body.

The total quantity of *ratoobat* (fluid) in person weighing 70 kg is between 40 litres to 49 litres (average 47 litres). It means the total quantity of fluid is 60% of the body weight. However, in children and in those tissues which are very active the quantity of fluid is more. Thus, in infant the total quantity of fluid is 75% of the body weight or more than that. This quantity is further excessive in foetus. And with advancing age this quantity is gradually reduced. Since this *ratoobat ghariziyah* is required for the preservation of *harate ghariziyah*, thus its deficiency affects all the systems of the body in old age.⁹ This *harate ghariziyah* and *ratoobat*, as per modern concept is the basal metabolic rate (B.M.R) and it got declined in advancing age (old age) as proved by modern investigations.⁹

According to *Nafis*, no doubt there is decline in *ratoobat e ghariziyah* in old but there is excess of *ratoobate gharibah ballah* (abnormal metabolic compounds). Thus these abnormal metabolic compounds which got accumulated in body during old age are responsible for various abnormal reactions leading to various signs and symptoms of various disorders in old age.

- *Quwa wa affal*; Amongst the umoore tabiyah *quwa wa affal* have been described and discussed separately as sixth and seventh factors respectively. However if looked closely, it is evident that the duo are so closely associated with each other that they could neither be think apart nor exist. Faculties are the causation of the function and the latter is proceeding from the former, whereas on the basis of function the faculty could be explained. Therefore, whenever there is a work/ function performed, there has been a power responsible for the performance. Faculties are classified on the basis of biological functions.¹¹ These are *Quwwat Tabiyah*, *Quwwate Haiwaniyah*, *Quwwat Nafsaniyah* and *Quwwat Tanasuliya*. Each faculty has its own principle member which forms its storehouse and from which its function emerge. *Quwwat Tabiyah*, *Quwwate Haiwaniyah* and *Quwwat Nafsaniyah* are necessary for the preservation of individual where as *Quwwat Tanasuliya* is necessary for the preservation of species.
 - *Quwwat Haiwaniyah*; Preserve the integrity of breath and is the vehicle of sensation and movement, make the breathe able to receive these sensations and having reached the brain makes it capable of imparting life and then spread in every direction. The

seat of this faculty is the heart, and its function proceeds from this.

- *Quwwate Tabiyah*; *Quwwate Tabiyah* is concerned with preservation and welfare of the individual and secures nourishment to it to the end of life. This faculty resides in liver and its functions emerge from there.
- *Quwwate Nafsaniyah*; *Quwwate Nafsaniyah* resides in brain and its function proceeds from brain. It is responsible for all the sensations and movements in the body.
- *Quwwate Tanasuliyah*; It ensures the propagation of race. It sub serves the process of generation and separates the substance of sperm from the humours of the body. The seat of this faculty is the generative organs (Testes and Ovaries) and its functions proceeds from them.¹²

Since any *quwwat* is not immortal, thus as the age advances there is decline in these supreme *quwa*, hence declines the various functions of the body.⁸ Some of changes are as follows;

- The heart supplies all nutrients and ruh (the *maddah* for *hararate ghariziyah*-real heat) and vitality to the organs, through the arteries which spring from the heart and reach to all organs.¹⁰ But in old age since there is decline in this real heat (*hararate ghariziyah*) and also, there occurs constriction of *urooq* (narrowing of the arteries),¹² thus hampers the normal functions of cardio-vascular system. Heart supplies *hararate ghariziyah* (nutrients and *ruh*) to the liver, but in old age *harate ghariziyah* due to its decline is insufficiently reaching liver, thus various metabolic functions of liver are hampered.
- *Quwwate ghaziyah* (nutritive faculty), a sub type of *quwwate tabiyah*, is that one which is responsible for ingestion, digestion, absorption, transformation and assimilation of *ghiza* (food) and excretion of waste products for the preservation of individual. *Quwwate ghaziya* accomplishes its functions with the help of the following three *quwa*
 - (i) *Quwwate mohassilah* (acquisitive power)
 - (ii) *Quwwate mulasseqah* (power of adhesion)
 - (iii) *Quwwate mushabbaha* (power of resemblance)

The derangement of *quwwate ghaziya* results in the following ailments.

- (i) When the absorptive power of this faculty is disturbed, it results in *huzaal*

/ *atrophy*. This is evident in old age.

- (ii) When power of adhesion fails the resultant is *istiasqai mai/* ascitis.
- (iii) When the power of resemblance is at fault the diseases which may develop include Bars/ leucoderma, and other changes in skin colour.¹¹

Quwwate ghaziyah is a dynamic faculty found in the persons as it is required. In growing age as it fulfils the requirements of the organs besides providing nutrients for growth, while in young age it is just sufficient to provide replenishment as growth has stopped in this phase of life. In old age it is weak and insufficient even for providing replenishment for wear and tear of the organs.

- Since it is evident that *hararat* and *ratoobat* are necessary for the digestion of food, because *hararat* (heat), denotes the chemical process of digestion i.e hydrolysis of food materials and *ratoobat* (fluid) signifies the presence of various digestive juices with their digestive enzymes and water contents which participate in the process of hydrolysis of food materials. But in old age both *hararat* and *ratoobat* are meagre, thus the process of digestion is deranged which in turn affects the formation of *akhlata*. All the systems of the body got deprived of the essential nutrients due to weakness in digestive process, hence the body becomes weak (*abdane zaeefa* as described by *Masihi*) thus the susceptibility to various diseases increases in old age.
- In old age *zubul* (degenerative changes) occurs in all the tissues and organs of the body due to weakness in *quwwate namiyah* (faculty of growth).⁹
- Since an optimal temperature is required for the spermatogenesis in males but due to decline in *hararat* in old age their sexual activity is also declined.
- Regarding the joint ageing, the first and foremost cause of the pathology of *Wajaul Mafasil* lies in the defective formation of *Rutoobate Mukhatia* (chyme) from *hazame kabidi* and *hazame urooqi*, as a result of which the abnormal chyme that is composed of abnormal phlegm gets accumulated in the joint cavities, resulting in restriction of their normal movements.¹³

According to *Masihi*, in old age, *wajaul mafasil* usually occurs by weakness of the joints and redundancy of *mawade fasidah*. These *mawad* are the product of imperfect digestion and of the retention of excrementitious substances, collect in those joints, which are laboring under debility and causes joint diseases.⁵

CONCLUSION

Ageing is a natural process and the physiological changes are thereby inherent. Various modern theories have been put forth to explain different physiological changes in ageing. However in Unani system of Medicine, the concept of physiological changes in ageing can be understood on the basis of *Mizaj*, *Tabiyat* and *Quwa wa Affal*. According to Unani system of Medicine, the human body is composed of seven basic and natural components called *Umoore Tabaiyah* and *Mizaj*, *Quwa* and *Affal* are among them. *Tabiyat* is the sum total of structural, functional and psychological character of the human being. It is the natural power- a prime mover, which when exists in a body, becomes cause direct or cause proximate for its active motion or rest. *Tabiyat* is also a *quwwat* that controls all *quwa* and their functions thus maintains homeostasis, with advancing age *hararate ghareezia* decreases resulting in relative *baroodat* in *mizaj*, *baroodat* weakens the *quwa* ultimately weaken the functions because *quwa* requires *hararat* for performing *afaal*. *Tabiyat* also weakens with increase in *baroodat*. As the *tabiyat* is best controller of all functions of the body whenever it becomes weak, it alters all functions of the body. Hence it can be understood that, the change in *Mizaj*, weakness in *Tabiyat* and decline in *Quwa wa Affal* are mainly concerned with physiological changes in ageing according to Unani system of Medicine.

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