

Drug-Disease Relationship and Role of the Food in Healthy Living

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Abstract

This piece of work is written while keeping in view of the advancement in understanding of genomics particularly in area of Epi-genetic revealing a dependency of genes operation and their regulation in form of network with diet consumed as food on regular basis [1].

Each component of food by virtue of functionality can have multifaceted role, for instances Protein is a source of amino acid that is nutrient as well as give energy. Whereas talking immunology protein present in the food can provoked immune response (allergy) whereas its three dimensional stereochemistry within living system particularly *in vivo* can confer upon it different roles e.g. enzymes or make it a component of organelles of cells so on, hence conferring upon food additional therapeutic role creating a cumulative impact on Human Health or transform into high risk factor modulating the progression of metabolic syndrome based diseases in particular depending on the composition processing and storage conditions if consumed regularly over a period of time. Prions e.g. infectious protein is a good example of nature where the stereochemistry transformation potential, pathogenicity and virulence all has overlapped together to confer on same type of molecules of protein emerged out of living systems effecting the neural cells all over the body including brain, diseases caused by them are transmissible and are fatal.

Keywords: Drug; Disease; Food

This paper is written using the understanding on genomics to compare the potential of food as therapeutic preparation (Nutrifortified Diets, paper covering their potentials has already been submitted elsewhere) with drugs those have so far been in use to treat the illnesses. Food other than water naturally has biological origin and hence with living system as *in vivo*, the genome of biological systems are programmed to successfully acquire a cumulative impact of whatsoever is consumed regularly as food provided it is naturally originated and respond accordingly eliminating the appearance of adverse effects commonly known as side effect that can happen when drugs are consumed to treat the disease. On other hand, drugs though can cause reaction (adverse immunological responses) and side effects but are the main options for treatment of emergency medical conditions in diseases.

There is a need to explore therapeutic potentials associated with different food preparations to make it happen true Food-Care and Cure for ALL.

Origin and destinations of Life

The Life starts as single cell, that divides to develop into multicellular mega structure body having different parts performing different functions whereas a similar organelle based functions at intracellular level keep going on throughout of the life of living entity. In addition to this physiological understanding of Life, parallel to this is a chemical aspect that appear as a cascade, there are a huge range of interconnected biochemical reactions converting a biochemical substance, usually not found outside the cell environment or living bodies after into a series of compounds that has potential to be reconverted back to precursor at several stages, forms the final product hence adding

flexibility and diversion of synthesis potential of the cells at the same time. Though starting as a single cell, following through a series of division, the diversity of potential of cells appears, making a sub set of them specialized for specific function which on multiplication take over the function of dying cell turned into debris and replace them physically. In simple words there are multiple multistage regulating locus of every single event taking place within the cell as well as a few of those that are taking place around the cell in its environment as well as component of cells all through interconnected means.

As long as the cells and their co-ordination carry on their intra cellular and extracellular activities as programmed genetically on preset paradigm, an individual stays healthy [2,3]. However over a period of time there appear a natural shift-drift in preset paradigm at genetically level reflected as aging characterized by change in appearance functionality sensitivity at cellular level as a consequence of delayed apoptosis [3] appears as aging on the living entity, as recently published food has been a key regulator of process of aging [3,4].

Living system s response to External Stimuli

The shift in preset paradigm programmed genetically can occur in response of stimuli, e.g. infectious agent, toxic chemical agent that is immunologically recognized as foreign body by the living system hence different than self, all those chemical entities that a fetus has encountered during their during early development in uterus, one of the reason that many chemicals including white sugar those are toxic with having low molecular weight and toxicity otherwise can manage to escape or camouflage the immune response of the body until the stage when autoimmune diseases are evoked, one of the conditions when such molecules can act as hapten otherwise causing oxidative stress hence interconnecting the diverse network of genetic regulation beyond being effected by any alteration in the basic functional unit of Genome e.g. gene hence the impact of mutation is confined to a limit, switching the target cells programmed from cell death (apoptosis) to appearance of damaged cells (necrosis e.g. evolution to adoption with impairment depending upon the target cells and adaption inducing stimuli) [3] a common manifestation of many non-infectious diseases including mental illnesses dementia etc. whereas prolonged progression of damaged cells can end up diminishing the contact inhibition phenomena for losing the control of modulation of regulatory mechanism based on cellular environment sensed at genetic level with having altered cell permeability within a given population of cells in target tissue having pockets of patches with deprived the access to detoxifying nutrients otherwise rich in lethal components e.g. oxidative stress inducing agents and cellular debris leading to gradual transformation towards evolution of multiclonal tumor [4,5] or plague formation depending on the type of cells involved as it happens in Alzheimer for being targeting the genetic regulatory networks differently as cells involved are in different generations for being replicated at different rate. Prions e.g. infectious protein having stereo-chemistry transformation potential, pathogenicity and virulence acting together giving same type of molecules of protein the potential to cause disease emerged out of living systems effecting the neural cells all over the body including brain, diseases caused by them are transmissible and are fatal. Bovine Spongiform Encephalopathy (BSE), which is also known as mad cow disease, is a good example of the disease caused by prion, that like other prion causing diseases can be transmitted to one another if the waste from animal particularly the animal blood is used in feed to improve the protein content of animal s diet, on having infection in animals that later on is transmitted to Human beings if prion infected animal s meat is consumed [6,7].

Multi-Faceted Role of Molecules

The environment within cell responds differently to different chemical species on exposure, so are chemicals compounds on being interacted with living systems of different species that can vary from individual to individual, many of them are only found within living entities e.g. cells hence are studied under the head of biochemistry whereas the reactions converting a precursor into product after passing into a number of biochemical reactions operating mostly as on cascade principle, many of them are reversible as well and are modulated by chemical species that are protein in chemical nature and are called enzymes those are specific for each reaction. In addition to the role of protein in regulation of cell s functions as per information stored in genome that is expressed under a given conditions governing the appearance of specific phenotype by virtue of being enzymes modulating the ongoing biochemical events taking place, protein is the integral part of each structural component of cell [2,3]. The building block of protein are amino acids, some of them can be synthesized within cell, the rest have to be taken from outside environment of the cell as food same as the need of food is for Human beings to provide the essential nutrients that body cannot prepare themselves. The availability of any specific given nutrient and its transport to the target locus of the cell can modulate the cellular activity and ongoing biochemical reactions in the given conditions, in other words food can govern the evolution of given phenotype in a given population of cells and in broader aspects, it can affect the aging process as well as appearance of different illnesses e.g. delay or completely inhibits the onset of given symptoms otherwise can initiation of progression of disease particularly non-infectious non-contagious diseases.

For instance Scurvy is caused by the deficiency of Vitamin C, deficiency of Iron causes anemia, Menkes Disease is the manifestation of copper deficiency, there is a never ending list of diseases those are proven to be caused due to deficiency of a given nutrient in the diet [8]. None of the Food or fluid from biological origin can so far be successfully chemically defined, in other words none of the food or biological fluid can successfully be synthesized chemically outside the cell, using catalysts. The reason is food or biological fluids comprise of a large range of chemical species, those are yet to be chemically categorized above all not all of them can be isolated successfully partly of complexity of structure mainly for instability outside the cellular environment. None chemically derived species can substitute the need of components comprising the food and its cumulative impact on the Human body more precisely on target tissues conferring on food a therapeutic role. Intake of chemically synthesized components as food ingredients (Additives) e.g. Margarine White Sugar, Flavour Fragrances, colours preservatives etc. particularly in commercially produced food products are proven to increase the risk of diseases like cancer allergy obesity mental illness joint pains blood pressure Heart disease Kidney Problems etc. [9,10] that is also evident in the report of WHO shared on its website that indicates metabolic syndrome related illnesses have been globally become the prime cause of death in recent days unlike the infectious diseases those were the main reason of death just a few decades ago.

Commercially prepared Food having additives and its impact on Health

Very likely the association of intake of synthetic additive added in commercially prepared food with increased incidences of metabolic syndrome related illnesses including cancer is because of lacking appropriate detoxifying mechanism and removal of waste often end up in resulting in accumulation of chemical residues in vital organs, as the cell's inner environment has never been exposed to these molecules having *in vitro* origin. White sugar is recently been identified to be a key player responsible for causing a wide range of metabolic syndrome based illnesses including mental illness kidney problem and cancer [11-15] by virtue of creating oxidative stress mediated damages that in parallel can trigger immune response on repeated prolonged exposure in small quantity that is manifested as inflammation response leading to further progression of appearing of new phenotypes in target tissues parallel to the drift in metabolic interdependent events with having a gradual onset of symptoms of diseases over a period of time [4,11-19].

Naturally Originated Food and therapeutic potential

Food that we consume other than water all has biological origin, that means that their components have been programmed genetically to be produced by target cells with organelles within the given species. It has already been established that living species carry the same origin and have undergone through the process of evolution that is genetically modulated in response of stimuli triggered from their environment [1] e.g. seasonal nutrient required variation is successfully fulfilled by the vegetation produced in the given season if consumed along with meat, fish poultry and dairy products produced domestically that includes the fermentation products as well e.g. sausages sauerkrauts pickles herrings wine vinegar yogurt cheese etc. those are prepared by the activity of beneficial micro-organism many of them are natural flora of soil vegetable spices etc. on the produce meat (marinate) or other food entity to be fermented in presence of salt with or without spices, vinegar oil or fresh lemon juice for a given time under specific conditions. Knowledge revealed during the experience earned while dealing with fermentation processes has been used to prepare probiotic preparations while exploiting the additional therapeutic potential of microbes associated with naturally processed food products, that are more pronounced by virtue of microbial activity in their natural habitat's environment and their risk factors are diminished when micro-organisms are administered in food that has been their natural habitat or in its comparable living condition being used to treat common ailment like diarrhea whereas naturally fermented products like Greek Yogurt is still a better option to cure the upset tummy issues more effectively in shorter span of time for having additional nutritional and therapeutic properties with enhanced safety, therapeutic potential of food with broader aspect are yet to be revealed [20-24]. It's very unfortunate that with having massive industrialization for commercial production of food, chemical processing and practice to incorporate synthetic chemicals in food as additives, the trend to produce and process food naturally by drying fermentation or cooking in small quantities has diminished all over the globe making organic food far more expensive to afford by common people and above all naturally produced and fermented products including unpasteurized honey is not available everywhere hence whatsoever we eat these days as food had already lost their therapeutic potential rather has already been transformed as high risk factor for being chemically processed with having incorporated synthetic compounds e.g. additives etc. for causing metabolic syndrome associated diseases including cancer and mental illness, a few aspect of this issue has been dealt earlier as well. To live young and healthy, it

is important to consume freshly prepared food having naturally originated ingredient processed at small scale with any chemical manipulation cooked at home including the fermented products prepared using the classical method by activity of microorganisms without any chemical manipulation that altogether have additional cumulative therapeutic properties as well the most common benefit of consuming such food is delaying the aging process [25]. Individuals Mental Health as well as general health, both are proven to be interdependent through mouth and gut connection regulated through microbes acting as intermediate connection factor to external environment [1-3,28,29], conferring upon food psychological [28,29] potential as well it partly explains that obsoleting the habit of eating raw vegetables and fruits in regular diet has been the key factor for initiation of a huge number of illnesses [22-27].

Disease and Drug Relationship

In response of stimulus there appears a drift in metabolic events when impact of stimulus is triggered at genomic level [1-5], that over a period of time, is reflected as transformation of physiological events localized in particular region or throughout the body depending upon the type of disease those are sensed as appearance of symptom of disease. Drugs are the chemically active compounds administered to treat the illness. Most of the drugs mainly work to suppress the symptoms, whereas it's mainly the body's innate mechanism that triggers disease resolution mechanism and the illness is cured over a period of time at its own for most of the diseases for which the biological system has already been programmed at genomic level, beyond the boundaries having functional genes [1-3] but the biological system since never been exposed during fetus stage to synthetic stimuli (food additives, chemical pollutants, radiations etc.) the illness, the genome lacks pre-programmed information to trigger the resolution mechanism, hence turns into chronic disease with having developed additional medical conditions over the period of time depending on genomic profile of individual environmental factors food psychological status and life style. The real challenge with having the present understanding latest Scientific Knowledge is the transport of drugs to the target site in the cells to mediate the effective complementation between the target sites and active moieties involved to initiate the repair mechanism that makes a large number of drugs ineffective when they are put on trials beyond the laboratory experimental conditions [30,31]. Since most of the drugs merely suppress the symptoms hence they fail to provide remedy for illnesses those happen in response of mal nutrition particularly specific nutritional deficiencies for having specialized nutritional requirement complementing their genomic profile that does vary from individual to individual, many of them have yet to be revealed.

Nutrifortified Diets are the food mixture or preparations that carry additional therapeutic potentials while being rich in nationally originated nutrients, a paper has already been submitted elsewhere [32].

Unlike the conventional drugs, Nutrifortified diets neither carry side effects nor provoke reaction (adverse immune response) but they under present understanding on knowledge cannot be used to treat emergent medical conditions.

Conclusion

It has been established that the variable response to environmental stimuli, has been proven essential for evolution to emerge with having a new phenotype that is well adopted that is co regulated genetically at transcriptional level hence constituting network governing the cellular function beyond the effect of mutation [1-3,19] hence our present understanding for drug development needs extensive revision after having an independent critical review of scientific literature published so far in Field of Medicine Pharmacy Food Sciences Biotechnology and Allied Sciences [30,31]. This huge gap in Understanding of Knowledge might take quite some time to deal with, meanwhile Nutrifortified diets provide a safer and healthier option to treat the common illness and prevent many others to happen if such diet is consumed on regular basis. Extending work to explore the cumulative food therapeutic potentials would reveal new horizon in Knowledge helpful to make it happen Food Care and Cure for ALL in near Future.

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