

Editorial

Hippocrates's Advice and Nutritional Secrets

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Editorial

If we go back to Hippocrates era "Father of medicine" it will find that he said wisdom says "Let food be your medicine and medicine be your food" and said also "To eat when you are sick, is to feed your sickness". In 2006, Functional Food Center (FFC) used similar statement "Let functional food is your medicine". The FFC defined "functional foods" as: "Natural or processed foods that contain known or unknown biologically-active compounds which provide clinically proven and documented health benefits for preventing, managing or treating the chronic diseases" [1]. The benefits of functional foods beside its basic nutritional properties have the potentiality to lower the risks of non-communicable diseases [2]. Diseases are now one of the major public health and socio-economic problems both globally and regionally, especially in poor and vulnerable populations which account for approximately 80% of deaths due to chronic diseases. Chronic diseases are not only harmful to the health, but also to the healthcare system and economy.

In consistent with Hippocrates's advice we can say that "Each illness has a medicine and medicine of illness is in the feed". This means that we must search in the earth about the specific feed which treats the illness either its reason was from bacteria or viruses. There are many varieties of plants (fruits, vegetables and herpes) containing potential useful extracts capable of fighting any disease or pandemic can hurt the humans. The plant extracts have been prospered thanks to the advanced techniques. For example, polyphenols and flavonoids which have several health-benefits (antivirus, anti-microbes, anti-inflammation, anti-cancers) were extracted by different methods such as Microwave Assisted Extraction, Ultrasound Assisted Extraction and Chemical solvents. Otherwise, estimation of polyphenols is carried out by one of the various devices such as High-Performance Liquid Chromatography (HPLC), High Performance Thin Layer Chromatography (HPTLC) and High-Performance Capillary Electrophoresis (HPCE). In the current time, the universe is suffering from coronavirus pandemic that threatens the humans. So, how to face the virus by using Hippocrates's advice.

It is known that viruses arise when there is a disturbance in

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any piece of genetic materials capable of moving within a genome, gained the ability to exit one cell and enter another one. Thus, viruses represent genetic elements having the ability to move between the cells or they represent free-living organisms that become intracellular parasites. Also, viruses may arise from remnants of cellular organisms. Some viruses e.g. have single-stranded genomes (e.g., flu virus), while others have double-stranded genomes (e.g., smallpox). Viruses are very small in size; the diameter may reach less than 200 nm and they can replicate inside the living host cell. Viruses do not contain ribosomes which in charge of cell's protein making translation from RNA molecule. Viruses (e.g., flu virus) can reproduce in different ways in the body and can also evolve over times. As long as the viruses change because of their replications inside the host body, vaccines must be also improved continually [3].

Virus can be spread in animals by blood-sucking insects and in human by coughing and sneezing.

Today, the human-being lives under coronavirus threats. Corona is a Latin word meaning crown around the virus; hence coronaviruses are enveloped viruses with a positive sense single-stranded RNA molecule genome. One of the lethal coronaviruses is COVID-19 which causes several deadly inflammations in the body. The diameter of virus is about 120 nm [4] and the envelope of the virus is a pair of electron dense shells [5]. COVID-19 causes many infections such as throat inflammation, fever, bronchitis, and pneumonia [6,7].

Coronavirus is spreading quickly in the universe that we live in it, so we must protect a man from its evils and worsts which weak and hurt body systems. Currently, COVID-19 kills thousands around the world because it infects millions of humans. It is important at the present time that we face this dangerous killer by Hippocrates's advice and recent scientific reports. This will save the humans or avoid the coronavirus infection altogether.

Scientific Point of View

It is known that immune system (white blood cells, T-cell and lymphatic nodes) is the first line of defense against any strange thing invades the body. Tissues and cells of all body systems are also in need to protect them from the harmful Reactive Oxygen Species (ROS) produced from the metabolic processes. The immune system cannot function properly without supporting it by macro and micro-nutrients that allow the body to fight and prevent the viral infections and disease. For instance, glutathione (antioxidant) has important roles in the immune response, where it reduces toxins, DNA damage, micro-organisms (viruses and bacteria) invasion, neutralizes the chemical and metabolic wastes and averts the free radical-derived mutations. Also, the harmful microbes (bacteria, viruses and fungi) will be quickly removed if there is a great concentration of glutathione, this will make sure that all components of the immune system are strong

and operating efficiently. With no integration of glutathione with the immune system, the immunity becomes weak and disturbs, thus cases of infections and deaths increase. Glutathione is considered the first step against the viral or bacterial infection because it strengthens the immune system. Glutathione protects immune cells and allows the new formed immune cells to proliferate for attacking the microbes. Feeds containing glutathione are extremely important because they boost white blood cell production for fighting infection, particularly the T-cells (lymphocytes). T-cells are the core of our immunity and tailor the body's immune response to pathogens, viral and bacterial infections or anything the cells recognize as being invasive. Glutathione is food of immune cells, boosting the strength of lymphocytes. Further, B-cell lymphocytes can identify the unwanted pathogen that the T-cells then attack. White blood cells are cells need an abundant supply of glutathione to be able to effectively protect us from invading micro-organisms and viruses. There is association between the viral disease and the nutrition status of host immune system. If the host is malnourished, the susceptibility to the viral infections will increase. The virus itself may also be affected by the nutritional status of the host.

Glutathione requires selenium for its production. Selenium is a trace mineral that the body incorporates into proteins to make over 25 different selenoproteins including glutathione peroxidase. Animals with a selenium deficiency, when contaminated with the flu virus, the flu virus mutated into a far more virulent form when it was passed on to the next animal. Glutathione levels in the blood decrease with increasing the ages, hence the older people are more susceptible to diseases than young ones, and this is because of reducing the life-sustaining antioxidant (glutathione) in the blood. Therefore, dietary sources of glutathione are necessary to replenish stores of glutathione and avoid losses. Magnesium deficiency causes glutathione depletion because glutathione production is dependent on magnesium. Glutathione synthetase requires-glutamyl cysteine, glycine, ATP, and magnesium ions to form glutathione. Meanwhile, low magnesium occurs as the free radicals increases.

Previous studies showed that nutritional deficiencies led to increasing the infectious diseases, where the viral infections such as rotavirus, measles, and parainfluenza virus are more dangerous with malnourished hosts than the well-nourished ones [8,9]. Vitamin A deficiency with severe measles infections resulted in high death rates as reported by Semba [10]. Therefore, vitamin A is recommended at the time of vaccination against measles infection. Both malnutrition and specific nutrients deficiencies, have been reported to be correlated with immune dysfunction, including impaired antibody responses, decreased macrophage activity and T cell dysfunction [11,12]. The viral pathogen per se may be impacted by the nutritional deficiency. Several viruses have been shown to develop increased virulence due to changes in their genomes as a result of replicating in a nutritionally deficient host. The mechanism for the viral genomic changes is not well known, but it may be related to the increased free radicals in the nutritionally deficient host. So, both the host and the pathogen can be influenced by the nutritional status of the host.

It is known that influenza virus is a segmented RNA virus in the Orthomyxoviridae family. These viruses are responsible for killing thousands around the world each year. Since, aged people and those who suffer from chronic diseases in the lung and heart are at the highest risk of dying from that virus. Influenza viruses may alter their surface proteins for avoiding the early detection by the immune system of an infected host [13].

Not only the viruses can infect the man, but also Reactive Oxygen Species (ROS) can cause many infectious diseases and abnormal metabolic processes. ROS have been found to link with Human Immunodeficiency Virus (HIV) infection in humans. Antioxidants are useful in the treatment of viral diseases not only alleviate disease symptoms but also decrease the long-term effects of chronic oxidative stress, which is linked to the development of cancer in some viral infections. It has been reported that ROS facilitated and promoted replication of virus depending on the cell and virus involved [14,15]. Also, ROS facilitated the viral infections to induce cancer in the liver. Hepatitis-causing viruses are various (Picorna-, Flavi-, Hepadna- and Caliciviruses), in addition to the delta agent associated with hepatitis B virus [16]. Infection with hepatitis viruses may last long time and is accompanied by chronic inflammation, where the cause of that was attributed to the increased production of ROS as reported by Ohshima and Bartsch [17].

Brugh found that Butylated Hydroxytoluene (BHT), a synthetic antioxidant protected chickens from Newcastle disease virus and prevented seroconversion induced by vaccination with avirulent Newcastle disease virus [18].

It could be concluded from the above that the nutritional status of the host man is imperative demand against the viral mutations like influenza and coronaviruses pathogenesis, with emphasis on bracing the immune system by the plant extracts (fruits, vegetables and herbs) contained polyphenols as potential antioxidants which strength the immune cells for attacking the viral pathogens from one side and ROS produced from the metabolic processes from other side. Some animal experiments (unpublished data) showed that punicalagin (potential antioxidant) extracted from pomegranate has a great benefit in increasing the total antioxidant and glutathione peroxidase concentrations. This fruit is cultivated in many countries, suggesting that this extract may be synthesized as a medicine for strengthening the immune system. So, Hippocrates advice has encouraged the scientists to discover secrets of nutrition which support the immune system and protect the humans from the viral pandemic under the current circumstances.

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