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Research on Environmental Factors and Lifestyles Related to the Prevalence of Infectious Diseases

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Abstract. In recent years, several infectious diseases like COVID-19 and Monkeypox have been spreading worldwide, causing varying levels of panic. This paper explores the development of these diseases against the environmental factors for the population that they are living in, and if a person's living lifestyle is associated with the prevalence and cumulative incidence of these infectious diseases, for example, the relationship with other epidemiological diseases (diabetes and cardiovascular disease, whereas the risk for a person having diabetes is higher than the population without the certain diseases). This paper provides a broad overview of information related to environmental factors and living lifestyles associated with infectious disease prevalence and cumulative incidence by reviewing and collating some data on industrialization and ecosystem, and people's living lifestyles related to exercise and nutrition. Based on data from past periods of high virus prevalence, polluted environments and bad habits may lead to a higher risk of being infected by infectious diseases.

Keywords: infectious diseases, environmental factors, living lifestyles

1. Introduction

Within the development process of the world in the past decades, different types of infectious diseases have appeared suddenly every once in a while, and most of these infectious diseases are plagues closely related to animals. The coronavirus that suddenly appeared in the past two years, and the monkeypox that inflows the world widely are two close examples. These diseases are now spreading all over the world, which caused a severe pandemic.

Some infectious diseases came out suddenly with no known cause, while there are some infectious diseases that appeared in the past but did not spread widely due to good control. From the tentative earlier formulation, it appears that most of the major infectious diseases have been raised from the Old World (Africa, Asia, and Europe), which has overwhelmingly temperate zones, and that animals are known to be the hosts of most viruses [1]. The situation that we are facing right now seems to be a small miniature of the Old World's circumstances, where the state of infectious disease in these countries is in a very severe situation. Viruses with strong infectivity cannot be completely eliminated. Therefore, while discovering ways to reduce the harm of infectious viruses to the human body, it is also important to improve their own resistance.

There are several factors that are influencing and will keep on influencing epidemiology and the health of the public, including factors shaping human health [2], such as diabetes and cardiovascular disease. The current research claims that the best way to prevent these diseases is to optimize people's

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lifestyle through regular exercise training and improved eating habits. As regular exercise training can improve the regulation of cardiac parasympathetic nerves, it can also improve myocardial regeneration capacity by stimulating the circulation of angiogenic cells [3]. For other diseases, such as lung cancer, changing a person's living environment (e.g., staying away from highly polluted areas) and avoiding habits (e.g., smoking) can lower the risk of a person getting lung cancer and prevent them from developing these diseases. Based on this information, a person's eating habits and living environment are closely associated with the prevalence of epidemiology diseases, especially in the chronic disease field, such as diabetes, cardiovascular diseases, and cancer.

Therefore, it is important to consider if these factors are also associated with infectious disease. This study collected research papers on environmental factors, daily intake, and exercising. These factors affect people's body systems that may increase the risk of people being affected by different epidemiological diseases. In addition, to explore how these factors change with the prevalence of getting infectious disease based on current understanding of infectious diseases. Especially in the era with the highly developed technology, if this hypothesis can be proved, it can reduce the probability of widespread transmission of infectious diseases throughout the population. If the recommendation of improving living conditions and lifestyles can reduce the risk of contracting these highly contagious diseases, further action can be taken to protect people from the certain risk of contracting infectious diseases.

2. Analysis

In the late 2019, the COVID-19 pandemic kicked off. In 2022, the emergence of different types of mutation of covid and the appearance of Monkeypox bring attention back to infectious diseases. In the past decades, some of the suddenly come infectious disease occurs in different time period and becomes a severe problem that affect the world with threaten. These infectious diseases need to be taken into great consideration, because the outbreaks of epidemics can cause very large numbers of people to be infected during the initial stages of pathogen development because their epidemiologists know nothing about them, and the fatality rate can even be affected by factors such as the patient's physical and psychological conditions.

Since the congnativness of these diseases, the whole society may enter a state of stagnation. Whereas, during this certain strategy, the virus was also at the top of the list of diseases related to lethality. Death rate increased, and the development of society has received resistance. People's lives have also been greatly affected. In this context, the emergence of epidemics has also triggered other health problems, such as increased prevalence of mental illness and reduced resistance. During the epidemic, people gradually realized the importance of immunity and the body's own resistance. However, the physical conditions are related to the environmental factors that patients have been exposed to and the living habits (diet and exercise) that they have.

It could be seen that there is considerable evidence proving that environmental changes and non-infectious diseases are associated with the depression of the immune system [4]. The immune system plays a vital role which is a very important network that is made up of various organs, cells and proteins that protect the body from harmful substances, germs, and cell changes like infections [5]. However, environmental factors and living lifestyle are factors that are closely relevant to the population that may impact their immune systems.

These factors may respond to people's immune system and activate the anti-inflammation. Since the activation of some inflammasomes and the trained immunity in association with cardiovascular risk factors and disease might confer increased risk of a hyperinflammatory response that exacerbates the effects of COVID-19-induced inflammation [6].

2.1. Environmental factors

Environmental factors play a vital role in daily lives, including water and air required for daily life, meat products and vegetables required for body consumption. Therefore, the harsh living environment will have a negative impact on the body.

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In tracing the source of many epidemics, it can be found that most of the diseases originated in Africa. Like plague, yellow fever, smallpox, and rinderpest, there have been major outbreaks in Africa. Although these epidemics have had a large impact in other regions, they have a higher infection rate in Africa. These are mostly related to the unequal geographic rise and spread of food production, which is enormously important, and all the reason constitute in many ways the inequalities with other areas [7]. Since Africa is geographically located in the tropics and has a relatively higher biodiversity, this is the reason that the region has a higher epidemic rate than other regions.

Also, there are other factors, like the advent of mining careers in this area, that also have a negative impact on the health of many individuals. Especially for areas that have relatively difficult conditions that are quite remote and in a very arid region with limited resources. [7] Based on the closed compound and the conditions in these poor compounds, they lead to a result of overcrowding, disease, and malnutrition [7]. All these contribute to the high mortality from malnutrition and infectious diseases.

During the planting process and the food production, the water resources and soil that need to be contacted will also have a certain impact on the final crop products. Long-term consumption of these affected products may cause people to ingest these products for a long time, which cause a certain impact on people's body system. Besides the production process of food, there are also other factors that may affect a person's risk of being infected by these infectious diseases.

The first monkeypox that has been confirmed in humans was in 1970. It was isolated from a 9-month-old child in the Democratic Republic of Congo. For children after 6-month-old, there is a higher probability for them to be exposed to different bacterial and viral infections. Based on the evidence that environmental influences during early life shape the developmental trajectory of the offspring and alter the risk of disease in adulthood. [8] These need to be considered when a certain infectious disease has been exposed. Better ways need to be considered compared to others that have a better immune system (more mature). Therefore, inflammation is a defense mechanism for patients to protect themselves.

2.2. Daily intake

Nutrigenetics, a related field of studying nutritional genomics. With this study, researchers are focusing on the role of specific genetic variants in the form of single nucleotide polymorphisms (SNPs) and how it will respond to dietary components [9]. The implications may lead to an interaction on health status and predisposition to nutrition-related diseases [10]. Then with the use of nutrigenetic, better nutrition styles could be designed for different people to better prevent them from divergent epidemic diseases. As mentioned from the environmental factor part.above, the ingredients of the body is an important consideration. Since the environment can affect the nutrient content of crops itself through daily intake, which can lead to a causation of disease.

The importance of diet determines the origin of the food and the way to processed is also crucial. For animals that have been infected by the virus, and later been cooked. The ingredients that have been infected by the virus aggravate the risk of being infected by the virus for people who come into contact with the ingredients, and the contact is carried out without proper disinfection. At the same time, the risk of infection may also be higher for those who eat it.

For some viruses (bacteria), the human immune system can recognize it and when it has been destroyed by the virus. At the same time, antibodies can act to kill the virus to prevent infection from occurring. However, if the immune system itself is less, then the risk of infection is higher. Therefore, lack of exercise may be a plausible factor, as it somehow reduces the body's ability to fight the virus.

2.3. Exercising modulate the immune system

In addition to the control and design of diet, it is also related to choosing appropriate exercise in daily life. By having the right amount of physical exercise, it can then be responsible to the muscle-derived myokines giving many of the beneficial effects of exercise, particularly by promoting a healthy anti-inflammatory milieu, which can also promote neuroprotection and reduce the risk of developing

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communicable and non-communicable chronic diseases [11, 12]. At the same time, a great body of scientific evidence may have contributed to establishing a positive correlation between a physically active lifestyle and health benefits [13]. When patients are sick, based on the patient's disease different medicine will be considered in use for healing the diseases. However, as what has been said by the father of "Modern" toxicology Paracelsus: "All substances are poisons; there is none which is not a poison; the right dose differentiates a poison from a remedy. [14]" The best way (or the first line treatment) to prevent disease is known to change a person's lifestyle, especially for patients who have diabetes and cardiovascular related diseases. Whereas, by doing repeated physical exercise sessions will improve immune surveillance and immunocompetence [11]. Muscle-derived myokines are responsible for many of the beneficial effects of exercise, particularly by promoting a healthy anti-inflammatory environment. In the human immune system, inflammation is its legitimate response to stimuli, such as pathogens, damaged cells, toxic compounds, or radiation [15], and works by eliminating harmful stimuli and initiating the healing process [16].

To sum up, the environmental factors, eating habits, and exercise habits that have been mentioned here will affect the human body to a certain extent. These factors may reduce the ability of our immune system which leads to a more susceptibility to these epidemic diseases. However, this information still needs to be studied in depth and massive data is needed to prove this idea.

3. Conclusion

During a pandemic, it shows how the virus emerges. Researchers need to pay attention to several parts. If the mechanics of how a virus infects a person, how it alters a person's gene production, then further steps may be taken. then further steps may be taken. Produce vaccines and even medicines to cure patients from diseases, whereas prevention is always the best way to keep the entire population away from infectious diseases. Since sequelae and medicinal use will have a certain impact on the human body, effectively avoiding contagious (infectious) diseases will help us to avoid subsequent situations to a greater extent from the root cause.

If the relationship between environmental factors and living conditions and epidemics can be demonstrated, this idea can be more widely popularized, thereby to a certain extent reducing the panic in the early stages of infectious disease detection to a certain extent. Further research can be done by doing several questionnaires with questions related to living environment and living habits, comparing people who are infected with the disease and people who are not infected to see how they relate to these possible effects of different factors. There may be some limitations, because there could be other affecting factors that need to be further considered, whereas people are different from each other, even if we all have similar body systems the effectiveness of certain factors might be different. However, through data authentication, we can better understand the inertia between the two and respond accordingly while disseminating information to the public.

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