Understanding Pathogens

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**Abstract**

Throughout history, different germs and diseases developed across the world. Some which were extremely severe and some being minor illnesses. But the questions that surfaced was how were these diseases developing, where were these diseases coming from, and how were humans coming in contact with these illnesses. A lot of research had to be accomplished before discovering the answers behind the evolution of different germs and diseases, which caused more questions that needed to be answered. Not only did the question of how these diseases are developed make a huge impact on the discovery, but after discovering the answer. Another question surfaced, which was how can these illnesses be treated or prevented. Many minor illnesses can be treated in multiple different ways, from a prescription to over the counter medication, or a simple home remedy. Several studies were also made regarding how one illness can be treated in multiple different ways, but some could not. Extreme severe illnesses are what scientists still struggle to understand, and are currently still discovering how to treat and prevent. Scientists discovered that understanding pathogens is a way of understanding how these diseases and illnesses were developing.

**Introduction**

In today's society, pathogens are normally thought of as an organism that attacks the human body. But really pathogens are organisms that are trying to live and reproduce, through surviving within a host. The majority of the people in this world have come in contact with multiple different infections. The reason for this is because pathogens are attracted to the human body. The human body is a nutritious, warm, and also has a moist environment that remains at a certain temperature, and the human body also renews itself when it needs to be renewed. Pathogens can come in many different levels of how infectious it possibly can be on humans. Pathogens can also infect any living organism such as dogs, cattle, rats, and cats. Some infections can be contagious, which is why the infection can continuously travel and contaminate various individuals. Infections can vary from minor to very severe, some examples would be a slight cold to an infection as serious as pneumonia. Not only can pathogens be found in infections, but they can also have a lot to do with diseases. The term disease refers to the normal tissue in the human body being impaired. A couple of examples of a disease would be sickle cell and diabetes. There are numerous different autoimmune diseases affecting humans in today’s society. An infection and a disease are not similar, infections are when pathogens attack the body and begin growing within a host. A disease is the consequence of the invasion and growth of a pathogen. For a pathogen to cause disease, the pathogen must enter the host body and attach to specific host cells and populate host tissues and cause damage to those specific tissues. Our body contains defense mechanisms to prevent infections, but sometimes the infectious agents can be very contagious to the point we are able to become ill. Researchers have studied and are still studying the way the body functions during the attack of an infection or disease and also how these certain pathogens can be beneficial to the human population.

**Pathogens**

As it was mentioned before, pathogens are organisms that are trying to live and reproduce within a host. Pathogens usually enter the human body through our eyes, mouth, nose, or urogenital openings. Other ways pathogens enter the body would be through wounds, bites, or indirect contact such as when an infected person touches a surface leaving microbes behind, and a person comes and touches that same surface area. There are four different categories pathogens can identify as, which is a virus, bacteria, fungi, or a parasite. A virus requires a living host, the goal of a virus is to enter the human body and occupy a cell where they multiply and spread to occupy other cells. Examples of a viral infection are the stomach flu and common cold. A bacteria can sometimes be a microscopic organism that usually appears in the shape as rods, spirals, or spheres. They appear large in size, people that are prone to bacterial infections are usually people who have a weak immune system due to a viral infection. Examples of bacterial infections would be strep throat, meningitis, and food poisoning. A fungi is a eukaryote, meaning their cells contain a nucleus. This means that they are much more difficult to kill, examples of a fungal infection would be ringworm and vaginal yeast infections. A parasite is an organism that invades a host and receives its energy from that host while causing illness in the process, examples of parasites are tapeworms and ticks. When infected with a pathogen it does not necessarily mean that it will lead to a disease. Pathogens tend to challenge the immune system in different ways, by killing or disrupting the cell function. The human body will usually react by developing a fever because heat inactivates many illnesses. Today different infections are being treated with vaccinations and antibiotics, but pathogens continue to infect the human population.

**Prevention and Treatment**

One treatment for fighting infections is by taking antibiotics. Antibiotics tend to either destroy or, stop the pathogen from reproducing. When used correctly antibiotics can actually save lives due to how severe the infection is, but when taking antibiotics and the symptoms disappear it is important to continue taking an antibiotic as directed. Antibiotics are not capable of killing every infection for example, viral infections are difficult to destroy and for that reason, antibiotics are not strong enough to kill viral infections. When a patient has a cold or the flu a physician usually prescribes antiviral drugs, "which fight infection by inhibiting a virus's ability to reproduce.” [[1]](#footnote-1) Another way to prevent or treat infections is by providing vaccines. “Vaccines work by helping your immune system develop immunity to a weakened or dead form of a germ.” [[2]](#footnote-2) Once the vaccine is provided to the patient and the patient comes in contact with the germ, the immune system will already know how to fight that specific germ off. Vaccines are usually used to prevent the chances of becoming infected with the flu, measles, or varicella. Antibiotics and vaccinations have helped today's society by allowing people to not have to worry about being infected with different diseases.

**Conclusion**

Pathogens are organisms that can cause diseases and illnesses, which include viruses, bacteria, fungi, or a parasite. Infections are when pathogens attack the body and begin growing within a host, a disease is the consequence of the invasion and growth of a pathogen. From discovering how diseases and simple illnesses were being developed, to becoming aware of how humans were coming in contact with illnesses, understanding pathogens have become so beneficial to the world. Scientists have worked hard to develop incredible medications, that can cure common illnesses in today's society. These specific antibiotics and vaccines have helped saved lives, cure painful infections, and help the immune system fight illnesses to keep people from getting sick. Medications and vaccines have become a necessity for several lives today.

References

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