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A Brief Note on Emerging Infectious Diseases and its Control

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Abstract

EIDs have been increasing steadily since at least 1940. For every decade since 1940, there has been a consistent increase in the number of EID events from wildlife-related zoonosis. An emerging infectious disease (EID) is an infectious disease whose incidence has increased recently (in the past 20 years) and could increase in the near future. The minority of diseases that are capable of developing efficient transmission between humans can become major public and global concerns as potential causes of epidemics or emerging infections (EIDs) account for at least 12% of all human pathogens. EIDs can be caused by newly identified microbes, including novel species or strains of virus (e.g., novel coronaviruses, ebolaviruses, HIV).

Keywords: Etiologic heterogeneity; Diabetes

Introduction

Human activity is the primary driver of this increase. Like new influenza strains, some EIDs arise from previously established pathogens. EIDs can also happen when a disease spreads to a new population in a different part of the world, like when West Nile fever spreads. As with Lyme disease, some well-known diseases can also appear in areas undergoing ecological change. Nosocomial (hospital-acquired) infections, such as methicillin-resistant Staphylococcus aureus, are emerging in hospitals and are extremely problematic due to their resistance to many antibiotics. Of increasing concern are adverse synergistic interactions between emerging diseases and other infectious and non-infectious conditions leading to the development of novel syndemics. Other infectious diseases can experience resurgence as a re-emerging disease, such as tuber [1-4].

Infectious and parasitic diseases, which were responsible for 26% of deaths in 2002, are the second most common cause of death worldwide, after cardiovascular diseases, according to the World Health Organization (WHO). Due to the spread of antibiotic, antiviral, and antifungal medication resistance or other emerging or chronic diseases that impair the immune system (such as HIV/AIDS, diabetes, and cancer), re-emergent infections have gained renewed virulence (the degree to which an organism can cause disease). In addition, re-emergence of infectious diseases that are intentionally spread in connection with bioterrorism poses a threat, as the 2001 anthrax attacks in the United States demonstrated. Even though only a few people were infected and killed in these attacks, the use of bioterrorism agents has the potential to cause widespread targeted attacks, which is especially troubling.

Discussion

Methicillin-resistant Staphylococcus aureus (MRSA) evolved from methicillin-susceptible Staphylococcus aureus (MSSA), also known as common S. aureus. Methicillin-resistant Staphylococcus aureus (MRSA) evolved from methicillin-susceptible Staphylococcus aureus (MSSA), also known as common S. aureus. However, other novel viruses may have been circulating in the species Many people carry S. aureus naturally and are unaffected in any way. Through genetic mapping of various strains of MRSA, researchers have discovered that MSSA acquired the mecA gene in the 1960s, which accounts for its pathogenicity; prior to this, it had a primarily commensal relationship with humans. Prior to this, MSSA was treatable with the antibiotic methicillin. It is hypothesized that when this S. aureus strain with the mecA gene entered hospitals, it came into contact with other hospital bacteria that had already been subjected to high antibiotic levels. The bacteria in hospitals suddenly found themselves in an environment with a high selection for antibiotic resistance after being exposed to such high levels of antibiotics. As a result, these hospital populations developed resistance to multiple antibiotics. The multiple genes that code for antibiotic resistance to various drugs were then acquired by MRSA when S. aureus came into contact with these populations, making it nearly impossible to control. It is thought that MSSA acquired the resistance gene through horizontal gene transfer, a method in which genetic information can be passed within a generation and spread rapidly through its own population, as multiple studies demonstrated. Horizontal gene transfer speeds the process of genetic transfer because there is no need to wait an entire generation for gene to be passed on. However, the most effective strategy for avoiding antibiotic resistance is prevention. Antibiotic resistance can be slowed by reducing unnecessary antibiotic use in both human and animal populations [5-7].

Tuberculosis (TB), which is endemic in regions inhabited by one third of the world's population and causes approximately eight million new cases and two million deaths annually, is another resurgent disease that has connections to the HIV/AIDS pandemic. The HIV-infected population has extremely high rates of tuberculosis. The one tuberculosis vaccine that is currently available provides some protection, but its effectiveness decreases over time. There is a pharmaceutical treatment that works, but patients have a hard time sticking to it and it takes a long time. This makes TB strains that are resistant to multiple drugs. Programs to develop novel vaccines, some of which are currently in the pre-clinical investigation stage, have benefited from this.

Even though there are dormant tuberculosis infections in more than a billion people, the disease becomes symptomatic when HIV

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weakens the immune systems. Shortly after HIV infection, TB risk doubles and continues to rise over time. According to a recent study, HIV was directly responsible for 9 percent of the 8.3 million new cases of adult TB worldwide in 2000. Additionally, HIV infection makes active TB treatment much more challenging, resulting in an increase in TB rates in regions with high HIV prevalence, particularly sub-Saharan Africa. The primary factor contributing to an annual increase of 6% in active TB cases is the spread of HIV in sub-Saharan Africa.

At the Church of Scotland Hospital in the rural KwaZulu-Natal Province of South Africa in 2005, a virulent strain of tuberculosis caused the deaths of all 53 infected patients, with the exception of one. The strain of tuberculosis known as XDR-which stands for "extensively drug-resistant-cannot be effectively treated with the majority of tuberculosis drugs and may be incurable.

More cases have been discovered at other South African hospitals since XDR was discovered. Experts in epidemiology and tuberculosis argue that XDR TB has likely spread beyond South Africa's borders into Lesotho, Swaziland, Mozambique, and possibly Zimbabwe. HIV is present in at least two out of every three people with TB in South Africa. Tens of millions of HIV-positive people in sub-Saharan Africa could be devastated by XDR tuberculosis if it spreads to the HIV-positive population [8-10].

Conclusion

Even if they already have the TB bacillus, HIV-negative individuals have a low risk of contracting tuberculosis. However, due to the fact that tuberculosis can be transmitted through the air, people who come into close contact with a living TB patient run the risk of contracting the disease. In the initial XDR-TB outbreak in the South African hamlet of Tugela Ferry in 2005 and early 2006, 52 people died. It seems likely that all of them had AIDS. The greater part of the patients passed on inside half a month of contamination with drug-safe tuberculosis, a remarkable TB death rate as per disease transmission specialist. Another term for acquired immunity is adaptive immunity, which refers to the resistance to infection that grows over time and is focused on a particular pathogen. Active and passive adaptive immunity are the two distinct types. T-cell mobilization against infected cells or humoral production of antibody molecules against a bacterium or virus constitute cell-mediated active immunity. Acquired immunity can be induced by infection or vaccination. By injecting the serum of a person who is already immune to a particular infection, passive immunity is induced.

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