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Review Article

Review on Zoonotic and Coinfected Diseases, Different Routes of Transmission, Zoological Factors for Transferring the Infections from Animal to Other Species

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Abstract

Zoonotic diseases are group of those diseases that transmitted from animals to the human in the form of germs categorized from microbial sources. Rabies is characterized by biting the dogs, cats and transmitted by infections from animal's surfaces to the human body. Psittacosis is the zoonotic disease that is transmitted by bird's infections that leads to abnormalities in liver functions. Brucellosis also the zoonotic disease characterized by infections particles in the form of food products. Polluted foods lead to food borne disease. Vaccines are used for the treatment of rabies in order to control the rate of transmission of rabies. The main purpose of vaccines is to develop the immunity against virus and provides long life protection against the microbial environments. Different antibiotics such as doxycycline and rifampin are used for *Brucella* but increasing the resistance against that drugs leads to challenge the mechanisms of resistance of antimicrobial drugs. There is need to synthesize the genome based drugs that can make certain alterations in genomics of the animals.

Keywords: Infection, zoonotic diseases, biological action, antibiotics, machanism of action.

INTRODUCTION

Zoonotic diseases are group of those diseases that transmitted from animals to the human in the form of germs categorized from microbial sources [1]. The transmitted germs infect the different tissues of the body by releasing the immune responses. Symptoms usually appear after transmission of infection into the human body such as flue, rashes, nausea, vomiting, coma and death. Zoonotic diseases are caused by harmful germs like viruses, bacterial, parasites, and fungi. These germs can cause many different types of illnesses in people and animals, ranging from mild to serious illness and even death. Zoonotic diseases as major cause of deaths due to rabies and other microbial infections leads to increased the risk of other severe infections that can cause autoimmunity in the body thus causing the death [2, 3].

There are different types of zoonotic diseases but most of them have become the global issues. These are rabies, psittacosis and HIV/Liver cirrhosis. Rabies are characterized by biting the dogs, cats by transmitted infections from animals surfaces to the human body [4]. Infections become persistent if not treated properly at early stages and body muscles may cramp due to accumulation of more clotting cells. Psittacosis is the zoonotic disease that is transmitted by bird's infections that leads to abnormalities in liver functions. Brucellosis also the zoonotic disease characterized by infections particles in the form of food products. Polluted foods leads to food borne disease. Signs and symptoms of brucellosis may include fever, joint pain and fatigue. The infection can usually be treated with antibiotics [5, 6].

Table-1: Shows the types of zoonotic diseases, causing agents and biological action

Disease type	Causing agent	Biological Action	Reference
Rabies	a zoonotic disease that is transmitted by biting the dogs, cats and other animals and transmitted infections cause the abnormality in nervous system by disrupting the brain ganglion cells.	Different symptoms appear that cause the acute neurologic coma alteration and ultimately death. Serum and spinal fluid are tested for antibodies to rabies virus.	[7, 8]
Brucellosis	It is transmitted by infected foods that remain undigested in the digestive tract of the human body.	It leads to severe inflammation in the intestine and causing the problems of digestive systems. There are different antibiotics available to treat this disease but the diagnosis at early stage and control measures helpful in prevention.	[11, 12, 13]
Psittacosis	Psittacosis is the bacterial infection caused by *chlamydia psittaci* that causes infections in birds. This infection once infection the birds, then chances of transmission to human become increases and causes lungs infections	This infection transmitted through the mouth-to-beak contact, or through the airborne inhalation of feather dust. Less commonly, these bacteria can infect people and cause a disease called psittacosis.	[15, 16, 17]

Characteristics of Rabies as Zoonotic Disease

Rabies a zoonotic disease that is transmitted by biting the dogs, cats and other animals and transmitted infections cause the abnormality in nervous system by disrupting the brain ganglion cells. It also transmitted through contact with the mucous membranes of mouth or eyes of infected animals [7]. After transmission of virus into the human, different symptoms appear that cause the acute neurologic coma alteration and ultimately death. The virus may be isolated from saliva or through a skin biopsy. However, by the time a diagnosis is confirmed, it may be too late to take action. This virus may be testes through the practical application of polymerase chain reaction (RT-PCR). Serum and spinal fluid are tested for antibodies to rabies virus. This virus leads to increased its replication by utilizing the proteins of the host cells, causing the destruction of human cells [8].

Characteristics of Treatment using vaccines against Rabies

Vaccines are used for the treatment of rabies in order to control the rate of transmission of rabies. The main purpose of vaccines is to develop the immunity against virus and provides long life protection against the microbial environments. These can be injected into the arm over the next 2 to four weeks and injected close to the bite wound, this can prevent the virus from infecting the individual. Injections also used for treatment of rabies that can control the muscle spasms at early stage of viral replication. The animal that bit you remains healthy during the observation period, then it doesn't have rabies and you won't need rabies shots. Short term treatment can leads to effective way for controlling the rabies and measures the other infectious diseases in different ways [9, 10].

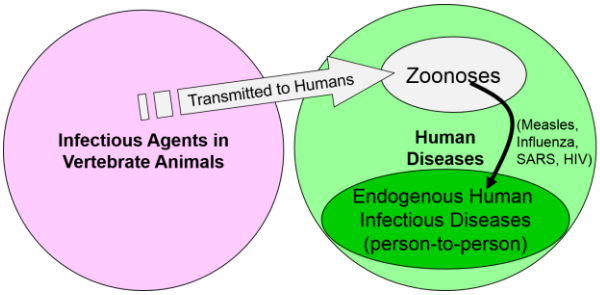

Fig-1: Shows the routes of transmission of zoonotic diseases

Characteristics of Brucellosis as Zoonotic Disease

Many other infections that increase the major concern to public health issues is the Brucellosis that is a zoonotic infection and caused by the bacterial genus *Brucella.* It is transmitted by infected foods that remain undigested in the digestive tract of the human body. It leads to severe inflammation in the intestine and causing the problems of digestive systems. The disease is an old one that has been known by various names, including Mediterranean fever, Malta fever, gastric remittent fever, and undulant fever. There are different antibiotics available to treat this disease but the diagnosis at early stage and control measures helpful in prevention. Long term undigested problems leads to borne other digestive tract diseases [11, 12].

Different symptoms usually appear after the attack of genus *Brucella* to digestive tract of the human that included the fever, joint pain and fatigue. Eat or drink unpasteurized dairy products from cows, goats, or other animals that are infected with the bacteria. Some factors increase the rate of transmissions such as village cheeses come from high-risk regions, work in a meat-processing plant or slaughterhouse. Different antibiotics such as doxycycline and rifampin are used for *Brucella* but increasing the resistance against that drugs leads to challenge the mechanisms of resistance of antimicrobial drugs. There are some control measures in order to

control the infections caused by *Brucella* such as work places where farmers or domestic workers [13, 14].

Characteristics of Psittacosis as Zoonotic disease

Psittacosis is the bacterial infection caused by *chlamydia psittaci* that causes infections in birds. This infection once infection the birds, then chances of transmission to human become increases and causes lungs infections as this infections colonizes the bronchi of the lungs by damaging the pulmonary walls. This infection transmitted through the mouth-to-beak contact, or through the airborne inhalation of feather dust. Less commonly, these bacteria can infect people and cause a disease called psittacosis [15]. Psittacosis can be treated through the single dose or combination of antibiotics such as tetracycline's and chloramphenicol are the choice in order to control the growth of growing *chlamydia psittaci*.

There are different strategies to control the infections caused by zoonotic diseases. Physical methods and control measures are best solution and zoological dynamics for removing the barriers of cages [16]. Physical hunting's leaves a infections pieces of microbial sources that are main source of spreading the hazardous materials. Feeding the birds properly and give them enough space so they're not crowded together in the cage. Therefore, it is important to consider the differences between taxa of zoonotic pathogens and hosts, because changes in the dynamics of the interface may be partly responsible for disease emergence. There is need to synthesize the genome based drugs that can make certain alterations in genomics of the animals. Palmarosa oil from *Cymbopogon martinii* is primarily used in skin care and treatment of throat infection and has also demonstrated the highest antimicrobial activity against *S. aureus* and *Escherichia coli* [17].

Drugs and their biological action for Zoonotic Diseases

There are different drugs that are used for treatment of zoonotic diseases caused by infectious particles from animal's sources. The most important drugs or medicines that are used in order to control their growth are streptomycin, tetracycline, chloramphenicol and cipfloaxin. *Brucellosis* can be controlled the action of streptomycin cells shows non-functionality to grow and mode of action id inhibition of the growth of bacterial due to the hindering the binding of the aminoacyl-tRNA to the acceptor site on the mRNA-ribosome complex. In this way, they inhibit the proteins synthesis of the bacteria that causes certain disease [18-20]. Psittacosis shows non-functionality to grow and mode of action id inhibition of the growth of bacterial due*;* they inhibit the proteins synthesis of the bacteria that causes certain disease. Rabies vaccines such as HDCV (Human Diploid Cell Rabies Vaccine) and PCECV (Purified Chick Embryo Cell Vaccine).

Each drug has its own mechanism of action for binding to the specific surface of the living cells and causing immune responses. Sometime, microbes show the resistance against the drugs used to control their growth at certain level [21-23]. The mechanism remains unclear how binding to receptors of the host in order to control their replication and ribosomal formation thus playing significant role in controlling the diseases at cellular level. Vaccines are used for rabies to develop the immune against cells that causes infections. The method of immunization increase the survival rate of organisms in the form of dead organism for long periods of time by activating the immune cells of the body that takes action against foreign particles and kills them effectively [24-26].

Table-2: Shows the types of drugs for zoonotic diseases

Disease	Drug	Biological Action	Cellular Action	Reference
Brucellosis Disease	Streptomycin	Cells shows non-functionality to grow and mode of action is the inhibition of the growth of bacterial cells	Inhibit the proteins synthesis of the bacteria that causes	[27, 28]
Psittacosis disease	Streptomycin	Misfolding of proteins due to the biological inhibitory action	Targeted to the proteins synthesis of the bacteria cell wall.	[28-31]
Rabies	HDCV and PCECV	*Rabies* vaccines	HDCV (Human Diploid Cell Rabies Vaccine) and PCECV (Purified Chick Embryo Cell Vaccine) provides early immunity in the body against rabies infections	[21-23]
Immunization/Drugs	Each drug has its own mechanism of action for binding to the specific surface of the living cells	The mechanism playing significant role in controlling the diseases at cellular level.	Provides immunity and activate body immune cells	[29-31]

CONCLUSION

Many diseases transmitted through the microbial infections from animals to other organisms. The main strategy to control them in better ways by establishing the animals taxas, evolutionary information about the specific germs, root cause of infection at cellular level, molecular aspects of diagnosis of infections either endotoxins or exotoxins. There are also variety of drugs that can be used to control them in combinations as tetracycline used with rifampicin have greater inhibitory effects on the bacterial cell wall distraction and inhibition of proteins synthesis.

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