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Perspective

Leishmaniasis and Different Immunotherapeutic Approaches

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DESCRIPTION

Human leishmaniasis is a parasitic disease transmitted by sand flies that can cause serious illness, especially in people with immature immune systems. It usually affects people living in developing countries in the tropics and has a high mortality rate. Transmission of the parasite begins with the bite of an infected sand fly. After being bitten by a female sand-fly vector carrying the *Leishmania* protozoan protomastigote, the protomastigote transforms into an amastigote in mammalian hosts. Once the amastigot enters the cell, the immune system begins to respond. Phagocytic cells absorb the parasite and destructive mechanisms are initiated to kill the parasite. However, parasites have a variety of ways to prevent or reduce immune system activity, resulting in Cutaneous Leishmaniasis (CL), Visceral Leishmaniasis (VL), and Mucocutaneous Leishmaniasis (ML). Three different forms of leishmaniasis are observed in CL usually occurs in uncovered areas such as the face, neck, and extremities that are prone to sand fly bites, and ulcers and nodules often form around the exposed areas. Under certain conditions, parasite-infected macrophages at the original bite site spread to the reticuloendothelial system, causing VL. Overgrowth of internal organs such as the spleen and liver is common in VL and can be fatal if the necessary treatments are not used. Another form of leishmaniasis is ML, in which the parasite invades mucosal tissues and effects are usually found in the oral cavity and upper respiratory tract.

Leishmaniasis is a widespread clinical condition caused by parasites of the genus Trypanosoma *Leishmania*. It is commonly spread by bites of *Phlebotomine* sandflies, *Phlebotomus*, and *Lutzomyia*, and is most common in the tropical and subtropical regions of Africa, Asia, the Americas, and southern Europe. This disease manifests itself in three ways: Skin, mucocutaneous or internal organs. The cutaneous type indicates cutaneous ulcers, and the mucocutaneous type indicates cutaneous, oral, and nasal ulcers. The visceral form begins with skin ulcers and later presents with fever, low red blood cell count, and enlarged spleen and liver.

Human infections are caused by more than 20 *Leishmania* species. Risk factors include poverty, malnutrition, deforestation and urbanization. All three types can be diagnosed by looking at the parasite under a microscope. In addition, visceral diseases can be diagnosed with a blood test.

Leishmaniasis can be partially prevented by sleeping under insecticide-treated nets. Other measures include spraying insecticides to kill sandflies and treating sick people early to prevent further spread. The treatment needed depends on the location of the infection, the type of *Leishmania* and the type of infection. Drugs that may be used for visceral disorders include liposomal amphotericin B, pentavalent antimony combination, paromomycin and miltefosine. Skin conditions may benefit from paromomycin, fluconazole, or pentamidine.

About 4 to 12 million people are currently infected in about 98 countries. About 2 million people are newly infected and 20,000 to 50,000 die each year. About 200 million people in Asia, Africa, Latin America and Southern Europe live in areas where the disease is endemic. The World Health Organization (WHO) has reimbursed some drugs used to treat the disease, which is classified as a neglected tropical disease. The disease can occur in many other animals, including dogs and rodents.

Symptoms of leishmaniasis are skin sores that develop a rash weeks to months after being bitten by an infected sand fly.

Leishmaniasis is one of the typical causes of a markedly enlarged (and therefore palpable) spleen. Organs that are not normally felt when examining the abdomen may even be larger than the liver in severe cases.

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