Sandfly Saliva Provides Important Clues For New Leishmaniasis Treatments

EurekAlert

Bethesda, MD-For millions of people who live under the constant threat of Leishmania infection, a new discovery by Brazilian scientists may lead to new breakthroughs, preventing these parasites from taking hold in the body or reducing the severity of infections once they occur. In a new report appearing in the Journal of Leukocyte Biology (http://www.jleukbio.org [1]), scientists show that specific molecules found in the saliva of the sandfly-a small flying insect that is the vector for the parasite-make it possible for Leishmania to evade neutrophils and live within human hosts. In addition to providing a new target for drug development, this discovery may lead to new tools that help doctors more accurately gauge the severity of infections.

"Neutrophils are considered the host's first line of defense against infections and have been implicated in the immunopathogenesis of leishmaniasis, the disease caused by Leishmania," said Valeria Borges, a Brazilian researcher involved in the work. "The identification of specific key factors from neutrophils linked to human visceral leishmaniasis immunopathogenesis can lead to the description of potential biomarkers for disease severity."

To make their discovery, scientists studied how the sandfly (Lutzomyia longipalpis), an important vector of visceral leishmaniasis, affected the neutrophils of hosts. They found that the salivary components of the sandfly induced neutrophil death pathways including FasL-mediated and caspase-dependent apoptosis, and this event was associated with Leishmania survival inside these dying cells. According to the U.S. Centers for Disease Control and Prevention, cutaneous leishmaniasis and visceral leishmaniasis are caused by more than 20 different leishmanial species. Cutaneous leishmaniasis is the most common form of the disease and causes skin ulcers. Visceral leishmaniasis causes a severe systemic disease that is usually fatal without treatment. Mucocutaneous leishmaniasis is a rare but severe form affecting the nasal and oral mucosa. The disease is transmitted by the bite of sand flies, and many leishmanial species infect animals as well as humans. The distribution of the disease is world-wide, with 90 percent of cutaneous leishmaniasis cases occurring in Afghanistan, Algeria, Iran, Saudi Arabia, Syria, Brazil, Colombia, Peru, and Bolivia and 90 percent of visceral leishmaniasis cases occurring in India, Bangladesh, Nepal, Sudan, Ethiopia, and Brazil.

"We are fortunate in the United States that when most of us think of bug bites we do not have to imagine picking up a parasite that can cause open wounds or major systemic problems in our bodies," said John Wherry, Ph.D., Deputy Editor of the Journal of Leukocyte Biology. "However, for the majority of the developing world this is a substantial problem and finding ways to prevent or cure this insect transmitted diseases urgent global health priority. This research report looks beyond the

parasite to see what other factors facilitate its colonization. Their discovery that the sand fly's saliva plays a critical role in the process for Leishmania should reveal new opportunities for therapeutics against this parasite."

SOURCE [2]

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