

The risk of developing leishmaniasis multiplies a hundredfold in transplant patients

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Researchers from Spain have analysed the prevalence of leishmaniasis among the population of organ transplant recipients. The findings of this study, published in the journal *PLoS Neglected Tropical Diseases*, confirm that the risk of developing visceral leishmaniasis, the most severe form of the disease which can pose life-threatening complications, is more than one hundred times greater in transplant patients living in areas of disease outbreak.

The number of cases of leishmaniasis in patients who have received organ transplants has quadrupled since the 1990s. In addition, the majority of the cases have been described in individuals who live in the countries of the Mediterranean basin, where outbreak of this [disease](#) is common.

Scientists from Carlos III Health Institute (ISCIII), in collaboration with Hospital 12 Octubre and the Fuenlabrada Hospital, analysed 63 individuals who had received solid [organ transplants](#). This analysis was carried out to determine how many of these [transplant recipients](#) had come into contact with the parasite responsible for this disease even if said recipients had remained asymptomatic; the analysis also served to evaluate the actual risk of developing leishmaniasis later in life.

"Being the recipient of an organ transplant is increasingly common among the Spanish population. As a consequence, it is necessary to both

prevent the risk of infection in [transplant patients](#) and to adopt appropriate measures for disease management and prevention in clinical cases in order to prevent relapses," explains Javier Moreno, a researcher at ISCIII and author of this study, to SINC.

Experts believe that these measures would be more useful in regions where outbreaks occur, such as in Fuenlabrada. "During this outbreak, eight cases of visceral leishmaniasis (VL, the most severe form of the disease which can have life-threatening complications) were reported among the group of 130 transplant recipients that live there," added Moreno.

"By comparing this incidence with that of immunocompetent patients -in other words, with those who have normal immune systems,- it has been shown that the risk of developing VL is over one hundred times greater in those patients who have received transplants," he continues.

Additionally, the second purpose of the study was to determine whether recovery in patients who had suffered from VL and had been treated for it was complete or if there was a chance of relapse, a very common occurrence among immunocompromised individuals.

To monitor these patients, researchers not only employed the serologic and parasitology testing normally used to diagnose leishmaniasis, but they also used lymphocyte proliferation assays and cytokine production, both put in place by Eugenia Carrillo, a researcher at the Leishmaniasis Laboratory at ISCIII, to determine the specific cellular response to this parasite.

"We observed that there was a high correlation between both the levels of stimulation and levels of cytokine production obtained in the cultures and the levels of cytokines detected in plasma. This correlation allowed us to confirm that both techniques were comparable, although the second

one was much simpler than the first," says the researcher.

These tests, in conjunction with techniques that are normally used, allow for the detection of individuals who have come into contact with the parasite and, though not currently sick, are at risk of developing the disease in the future. In fact, it is common for VL to appear in transplant recipients after months or years of receiving immunosuppressive therapy to prevent rejection of the transplanted organ.

Relapse prevention

In transplant recipients who had already developed VL and had been treated for it, these tests allowed for confirmation of their recovery (not only their clinical recovery but also their immunological recovery). In cases when the transplant patient has not completely recovered from the disease, these tests allow researchers to consider the benefit of new chemotherapeutic treatments to prevent relapses.

"These tests also help to evaluate any prior contact that individuals about to receive a solid organ transplant and long-term [immunosuppressive therapy](#) might have already had with the parasite. In these cases, these patients are at risk for losing their natural protective cellular response to Leishmania during immunosuppressive treatment, thus putting them at risk for developing VL," conclude the researchers.

Breakdown: The disease in Spain

In Spain, leishmaniasis is a disease caused by the parasite *Leishmania infantum* and is present throughout almost the entire Iberian Peninsula and Balearic Islands. The reported average incidence per year is 0.45 cases/100,000 inhabitants (4,966 cases between 1997 and 2011).

33% of the reported cases of leishmaniasis in Spain occur in children under nine years of age. Another 33% occur in HIV-co-infected adult individuals, since HIV is a serious risk factor for the development of visceral leishmaniasis (VL) as well as relapses following treatment.

Other conditions of immunosuppression, such as those caused by a solid organ transplant or by receiving immunosuppressive agents or biologic therapies, are currently coupled with HIV infections as an individual risk factor for developing VL.

More information: Eugenia Carrillo et al. Cytokine Release Assays as Tests for Exposure to *Leishmania*, and for Confirming Cure from Leishmaniasis, in Solid Organ Transplant Recipients, *PLOS Neglected Tropical Diseases* (2015). [DOI: 10.1371/journal.pntd.0004179](https://doi.org/10.1371/journal.pntd.0004179)

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