Biotherapy Journal Forum Review
Dr. Sherman, April 2015

For his first Biotherapy Journal Forum, Dr. Sherman decided to review Polat and Kutlubay's article: Four cutaneous leishmaniosis case resistant to meglumine antimoniate treatment. Even though most of the article is written in Turkish and Dr. Sherman is not able to read it, he felt that the study was novel enough to warrant his attention. Perhaps it warrants your attention, too.

Journal Citation: Turkiye Parazitol Derg. 2014;38(3):177-80. doi: 10.5152/tpd.2014.3410.
Authors: Polat E1, Kutlubay Z.
Title: Four cutaneous leishmaniosis case resistant to meglumine antimoniate treatment.

OBJECTIVE: to evaluate the results of treating cutaneous leishmaniasis (caused by meglumine antimoniate resistant Leishmania major) with maggot therapy (Lucilia sericata larvae).

METHODS: Patients with cutaneous leishmaniasis (documented by histology, culture on Novy-Nicolle-McNeal (NNN) and Roswell Park Memorial Institute (RPMI) 1640 media, and real time polymerase chain reaction (PCR) were treated with meglumine antimonate (Glucantime). Those who failed therapy with meglumine antimonate and continued to grow the parasites were subsequently treated with liposomal amphotericin B or L. sericata larvae.

RESULTS: Four patients failed therapy with meglumine antimonate and continued to grow amastigote forms of the leishmania parasite (Leishmania major). Two were then

treated with amphotericin B; two with maggot therapy, resulting in clinical and laboratory cures.

AUTHORS' CONCLUSION: Cutaneous leishmaniasis caused by meglumine antimonate resistant L. major was successfully treated with maggot therapy, using Lucilia sericata larvae.

REVIEWER'S COMMENTS: Cutaneous leishmaniasis is a devastating tropical parasitic disease, causing facial scars that can cost a person their health, their livelihood, their status within their community, or a potential marriage. While not a contagious disease (not spread from person to person), leishmaniasis is still an infectious disease that needs to be eradicated quickly in order to minimize tissue damage and eventual scarring.

Interestingly, leishmaniasis is transmitted to humans by the bite of a small fly (sandfly), and it is now another fly (blowfly) that is being used to treat the infection. Certain species of sandfly (phlebotimine sandflies) acquire the infection by sucking the blood of infected individuals. Once inside the sandfly, the protozoal parasite (Leishmania sp) changes form, multiplies, and journeys to the mouthparts (proboscis) so that they can enter the blood of the next victim that the fly bites. As the fly bites and sucks blood, the parasite is injected into the host. The human immune system (specifically the white blood cells called "macrophages") attempts to deal with this infection by ingesting (phagocytosing) the parasites . . . but the parasites continue to live within the macrophages, traveling to - and causing disease in - either the local skin ("cutaneous leishmaniasis") or the major organs like spleen and liver ("visceral leishmaniasis").

Maggot therapy has previously shown potential as a treatment for cutaneous leishmaniasis. Several years ago, cutaneous leishmaniasis wounds induced in mice, using Leishmania amazonensis, were effectively healed using maggot therapy (Arrivillaga J, Rodríguez J, Oviedo M. [Preliminary evaluation of maggot (Diptera: Calliphoridae) therapy as a potential treatment for leishmaniasis ulcers]. Biomedica. 2008; 28:305-10). Leishmania tropica was also effectively erradicated from mice wounds using only the maggots' (Lucilia sericata) digestive secretions (Polat E, Cakan H, Aslan M, Sirekbasan S, Kutlubay Z, Ipek T, Ozbilgin A. Detection of anti-leishmanial effect of the Lucilia sericata larval secretions in vitro and in vivo on Leishmania tropica: first work. Exp Parasitol. 2012; 132:129-34).

With this latest publication, we know that the treatment of cutaneous leishmaniasis by maggot therapy is a clinical reality, at least for Leishmania major. It is my prediction that we will see maggot therapy used more and more, as antibiotic resistance spreads.