Effect of supplementation with arachidonic or docosahexaenoic acid on *Leishmania* infectivity to cultured macrophages.

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Leishmania parasites are the causative agents of visceral leishmaniasis (VL), mucocutaneous leishmaniasis (MCL) or cutaneous leishmaniasis (CL) in humans, and canine leishmaniasis. *Leishmania* is an intracellular parasite that infects macrophages of mammalian host. The *Leishmania* life cycle is divided in two phases, the promastigote stage on the insect vector and the amastigote stage inside the host's macrophages. Lipids are important in parasite biology as they provide an interaction platform between the parasite and the host during the infection. In this work we focused on the role of fatty acids (FA) in the infectivity of *Leishmania*. Two isolates of *L. infantum* human strains, causing VL (MON-1) or CL (MON-24) were supplemented with arachidonic acid (AA) or docosahexaenoic acid (DHA). In both strains, the proportion of AA or DHA in total lipids was accordingly increased after FA supplementation. The effect of FA enrichment was then evaluated on parasite infectivity by measuring several indicators: number of intracellular amastigotes by DAPI coloration, reactive oxygen species (ROS) production using fluorescent probe and flow cytometry, production of fatty acid oxygenated metabolites by LC-MS/MS. After supplementation with AA, parasite infectivity of both *Leishmania* strains was increased. DHA supplementation increased the infectivity of MON-24 but not MON-1 strain. ROS production was elicited in infected macrophages and no significant difference was observed between control and supplemented parasites. FA supplementation was correlated with a marked increase of oxygenated metabolites production in both Leishmania strains, especially 17-HDoHE and 14- HDoHE for DHA, and PGE2, PGD2, LxA4, and 8-,12-,15-HETE for AA. As these metabolites are regulators of inflammatory response, their production may be related to the increased infectivity rate of FA supplemented parasites.