Adipose Tissue as a New Target of *Mycobacterium leprae* Infection

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Introduction: Macrophages and Schwann cells lipogenesis importance to intracellular *M. leprae* survival has already been demonstrated by our group. Here we described the involvement of adipocytes, the main lipid reservoir in mammals, in leprosy. **Objectives**: Describe the interactions between adipocytes and *M. leprae in vitro* and *in vivo*, to characterize a possible new site for *M. leprae* infection and persistence, thereby revealing an important and previously unknown role of adipose tissue on the pathology. **Material and Methods**: Murine fibroblasts 3T3-L1 differentiated to adipocytes in DMEM high medium containing 10% fetal calf serum, 0.5mM 3-isobutyl-methylxanthine, 1µM dexamethasone, 2µM rosiglitazone and 0.3UI/ml of insulin. After day 3, medium was replaced by DMEM-10% FCS containing only 2µM rosiglitazone and 0.3UI/ml insulin until day 10, and murine macrophages Raw264.7 were used for infection by *M. leprae*. Lipolysis was determined by Glycerol Detection kit (ZenBio). Adipocytes infection rate was determined by microscopy using fluorescent *M. leprae in vitro,* and LAM and PGL-1 immunohistochemistry *in vivo.* Intracellular *M. leprae* viability was determined through 16S RNA levels by Real Time PCR. Adipokines levels were determined in multibacilary patients sera by luminex using Milliplex MAP Kit (Millipore). **Results and Discussion:** Our results show that *M. leprae* remains viable inside adipocytes for up to 15 days *in vitro*. We demonstrated the presence of *M. leprae* in multibacillary pacients adipose tissue, indicating that the tissue is a target of infection *in vivo*. We also observed lipolysis induction in infected adipocytes *in vitro* and *in vivo*. Regarding the adipokines modulation in multibacilary patients sera, we observed an increased in the levels of adiponectin, MCP-1, TNF-α and resistin whereas leptin was decreased in pacients analysed. **Conclusions:** Our work suggests that adipose tissue can act as a site of *M. leprae* infection not identified until now, contributing to the complex immune regulation involved in leprosy.

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