The Immunomodulatory and antimicrobial anti-Candida effects of Lactobacillus rhamnosus, in vitro and in vivo


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Based on previous studies, which demonstrated the reduction on prevalence and amounts of Candida in the oral cavity of young and elderly individuals after consumption of probiotics, we have been studied the immunomodulatory and antimicrobial anti-Candida effects of Lactobacillus rhamnosus, in vitro and in vivo. For this, suspensions of Candida albicans were inoculated in the oral cavity of experimentally immunosuppressed mice for induction of candidosis. The animals were divided into four groups: a) with induction of candidosis without consuming probiotic; b) with induction of candidosis with probiotic consumption just during the inoculation of Candida; c e d) without inducing candidosis on those two different manners regarding the consumption of probiotics. Oral cavity samples were collected and the yeasts were counted. After animal sacrifice, the tongues were macroscopically analyzed and immersed in formalin for histopathological investigation. In addition, serum samples were collected for analysis of TNF-α, β IL-1, IL-4, IL-6, IL-10, IL-12, by ELISA technique. The ability of L. rhamnosus to induce the release of TNF-α, β IL-1, IL-4, IL-6, IL-10, IL-12 and nitric oxide by macrophages (RAW 264.7) was also investigated in vitro. In vitro anti-Candida antimicrobial action of L. rhamnosus was investigated using agar diffusion and planktonic growth inhibition tests. The preliminary results of the in vitro experiments showed that L. rhamnosus was not able to interfere in Candida growth. Regarding cytokines, L.rhamnosus could induce the release of TNF-α, IL-6, nitric oxide and IL-10, sometimes like endotoxin. The in vivo studies revealed a reduction in amounts (cfu/mL) of Candida in the oral cavity of animals from group b (with probiotic consumption), however this difference was not statistically significant. Regarding cytokine analyzes, all groups showed low levels of TNF-α, IL-4, IL-10 and IL-12, and there was no statistical difference between them. The IL-6 production was better verified and although the groups with consumption of probiotics (b and d) had presented lower levels of these cytokine, the difference was not significative. So, the results have shown that L.rhamnosus seems to reduce Candida amounts in oral cavity of animals with candidosis, probably by interfering with its adhesion not with its growth, and inducing or modulating the secretion of cytokines.

Biography

Graduated in Medical Biology by Federal University of São Paulo(1996). Master and doctoral degrees in Oral Bio-pathology in São Paulo State University, (1999-2002). She is currently an Assistant Professor of Microbiology and Immunology at the University of Taubaté (Taubaté) and postdoctoral researcher at School of Dentistry of São José dos Campos, São Paulo State University, where she contributes to the project “Study of Immunomodulatory and antimicrobial anti-Candida action of Lactobacillus rhamnosus”.

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