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Lactobacillus rhamnosus can interfere with Candida albicans Pathogenicity

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ased on previous studies, which demonstrated that the consumption of probiotics was able to reduce the prevalence and amounts ased on previous studies, which demonstrated that the consumption of resulting and elderly individuals, we have been studied the effects of Lactobacillus rhamnosus on the pathogenicity of Candida albicans.

Aiming to investigate the influence of *Lactobacillus rhamnosus* intake on the development of candidiasis and cytokines release, in vivo experiments were performed. Candida suspensions were inoculated into the oral cavity of experimentally immunosuppressed mice for candidiasis induction. The animals were divided into experimental groups: candidiasis with no probiotic intake (F), candidiasis with probiotic intake during Candida inoculation (FP) and candidiasis with probiotic intake 14 days before inoculation with Candida (FPP); and control groups: (C), (CP) and (CPP) without inducing candidiasis with probiotic intake in the same manner as groups F, FP and FPP, respectively. After these periods, samples were collected from the oral cavity for yeast counts and, after euthanasia; the tongues of the animals were removed for histological analysis. Sera samples were also collected for analysis of IL-1 beta, TNF-alpha, INF-gamma, IL-12, IL-4, and IL-10. FP group showed lower Candida counts in the oral cavity, and the presence of Candidawas almost not detected in FPP group. In tissues, the counts of fungi were significantly lower in FPP group, followed by FP. Groups that consumed probiotics also had lower histological and inflammatory infiltrates compared to F. Cytokines analysis demonstrated low concentrations of TNF-α, IL-12, IL-4 and IL-10 in all the groups, and no statistical difference between them. The production of IL- 6 could be better detected and the experimental groups that consumed the probiotic showed significant lower levels of this cytokine.

Other experiments investigated, in vitro, whether the interaction with Lactobacillus rhamnosus could interfere with the expression of virulence factors by Candida albicans. Therefore, these microorganisms were grown in biofilms, Candida strains were isolated and the expressions of the major virulence factors were investigated. The production of phospholipase, protease and hemolysin were observed in appropriate media; filamentation, after growth in serum and observation of germ tubes formation; biofilm formation, after growth in microtiter plates and reading in spectrophotometer; and hydrophobicity, by the use of xylene. The strains were also tested for antifungal sensitivity to amphotericin B, fluconazole and ketoconazole. The results were compared with strains of Candida grown in the absence of lactobacilli (control group). It was observed that Candida cells which interacted with L. rhamnosus (test group) showed significantly lower proteinase and hemolysin activity, when compared with control group. The germ tube formation and biofilm formation capacity also decreased significantly in tested groups, which also demonstrated alterations in susceptibility to antifungical drugs.

These results suggest that L. rhamnosus intake, especially preventively, may avoid or decrease the development of candidiasis, probably by interfering with the virulence factors of C. albicans and reducing its pathogenicity.