ORAL PROBIOTIC TREATMENT (LCR RESTITUO® AND LCR LENIO®) PREVENTS VISCERAL HYPERSENSITIVITY TO A COLONIC INFLAMMATION AND AN ACUTE PSYCHOLOGICAL STRESS IN RATS

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PROBIOTIC TREATMENT (LCR RESTITUO® AND LCR LENIO®) REDUCES CENTRAL AND PERIPHERAL VISCERAL HYPERSENSITIVITY IN RATS.

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INTRODUCTION

Irritable bowel syndrome (IBS) is characterized by chronic visceral pain. In IBS patients, the visceral hypersensitivity (VH) involves peripheral and central influences. In animals, VH can be induced by TNBS intracolonic injection or partial restraint stress (PRS). In humans, a recent pilot study has shown the efficacy of these probiotics (Lcr Restituo® and Lcr Lenio®). The aim of this study is to investigate the effects of these probiotic strains in TNBS- and stress-induced VH.

MATERIAL AND METHODS

Induction of peripheral VH: at D_{-7}, an intracolonic injection of TNBS was performed in the proximal part of colon in male SD rats.

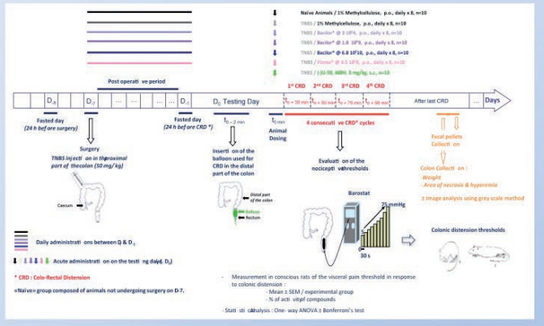
Induction of central VH: female Wistar rats were placed for a 2h-period into a Plexiglas restraint cylinder.

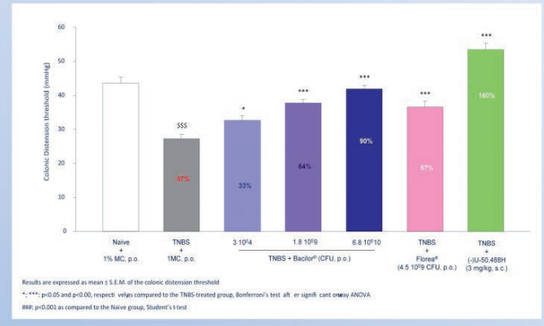
Read-out: At D_0 or after stress, a balloon was progressively inflated from 5 to 75 mmHg and colonic thresholds were determined as the pressure (mmHg) required to elicit abdominal contraction.

Treatment: the animals received a daily gavage of Lcr Restituo® or Lcr Lenio® during 8 consecutive days.

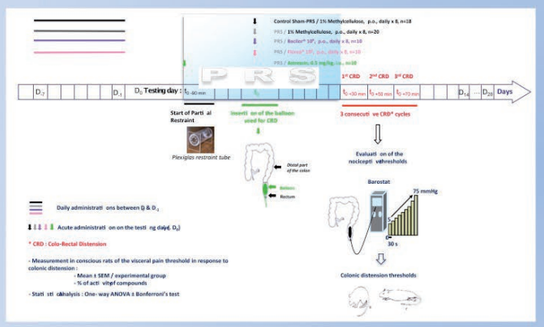
Dosage of cytokines and probiotics: After testing, colon samples were homogenized. In the supernatants, 4 cytokines have been measured by ELISA: TNF-α, IL-12p70, IL-10 and IL-23. Stool samples were collected to control the presence of probiotics.

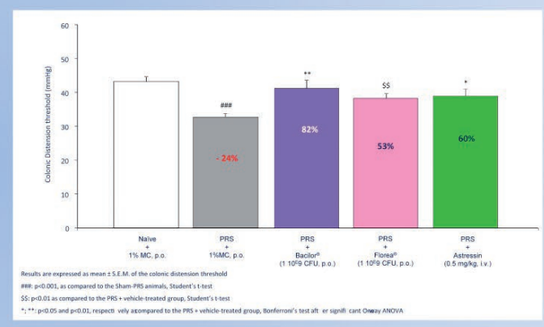
1. TNBS-induced visceral hypersensitivity (peripheral component)



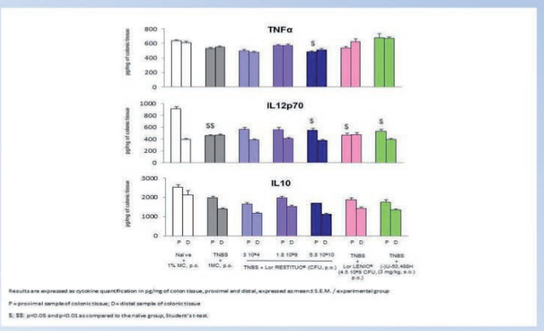


2. PRS-induced visceral hypersensitivity (central component)

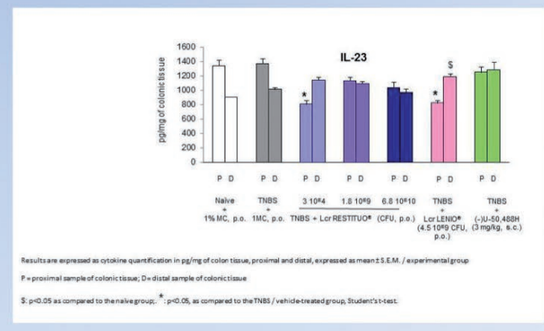




3. Cytokines levels in the colon



4. IL-23 level in the colon



RESULTS

1. Chronic treatment with Lcr Restituo® (10^4 - 7.10^{10} CFU/g) reduced in a concentration-related manner TNBS-induced VH.

2. At commercialized concentration (10^9 CFU/g) Lcr Restituo® and Lcr Lenio® exhibit a similar efficacy either in TNBS-induced VH or PRS-induced VH.

3. TNF-α, IL-12p70 and IL-10 levels were not modified by any of both probiotic treatments. For IL-23, both probiotic treatments (Lcr Restituo® and Lcr Lenio®) significantly decreased cytokine level when compared to placebo control group.

4. The presence of probiotic strains was found in all animals treated with Lcr Restituo® or Lcr Lenio®.

CONCLUSION

Chronic treatments with Lcr Restituo® or Lcr Lenio® diminished peripheral and central VH.

An immunomodulatory effect of the probiotics was highlighted in the TNBS model on the IL-23 secretion, suggesting a regulation of the local IL-23/Th17 immune activation.

These results suggest the potential role of Lcr Restituo® or Lcr Lenio® in the treatment of the VH in IBS patients.

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