

Probiotics in oral health and disease: a systematic review

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Table S6- Characteristics of clinical trials of probiotics in peri-implantitis

Reference Oral condition	Parameters evaluated - Evaluation time	Study design - Groups of study	Sample size (at the end of the study)- Age or age group	Vehicle - Administration time	Probiotic strain(s) used (Dose)
Laleman et al., 2020 Peri-implantitis	Clinical: PI, GI, BOP, PD/ Microbiological (tongue, salivary, subgingival samples) - baseline, 6, 12, 24 weeks	RCT, double-blind, pilot study / 1 st step: SRP, 5 topical drop - Probiotic group and Placebo group	19 patients with initial peri- implantitis (pocket >6mm, bone loss 3mm) –	Drop (5) and lozenges – 12 weeks (twice a day)	<i>Lactobacillus reuteri</i> ATCC PTA 5289 and DSM 17938 (10 ⁸ CFU)
Lauritano et al., 2019 Peri-implant mucositis	Clinical: GI, PD/Microbiological: <i>P.gingivalis</i> , <i>T.forsythia</i> , <i>T.denticola</i> - baseline, 28 days	RCT controlled placebo, pilot study - Probiotic group and Placebo group	10 healthy patients -	Lozenges – 28 days (once a day)	<i>Lactobacillus reuteri</i>
Ahmedbeyli et al., 2019 Peri-implant mucositis	Clinical: PI, GI, BOP, PD/ Microbiological/ Immunological: levels of IL-1 β , IL-4, TNF- α (pg/mL)) - baseline, 1, 6 months	RCT controlled / 1 st step: periodontal treatment - Probiotic group and Placebo group	42 patients -	Sachet 4g - 30 days (once a day)	<i>L. reuteri</i> DSM 26866, <i>L. rhamnosus</i> DSM 21690, <i>L. bulgaricus</i> DSM21690, <i>Bifidobacterium animalis ssp. Lactis</i> DSM 17741
Peña et al., 2018 Peri-implant mucositis	Clinical: PI, BOP, PD, BOP)/Radiological (marginal bone loss) /Microbiological (subgingival plaque in peri-implant pocket samples) - baseline, 15, 45, 135 days	RCT parallel, triple-blind Screening (day 0) -> 0.12% CHX for 15 days -> day 45: intervention beginning (30 days) - Probiotic group (mechanical therapy + CHX 0.12% + probiotic)/Control group (mechanical therapy + CHX 0.12%)	50 healthy patients with implant with peri-implant mucositis - > 18 years	Tablet - 1 month (once a day)	<i>Lactobacillus reuteri</i> DSM 17938 and ATCC PTA 5289
Galofré et al., 2018 Peri-implant mucositis and peri-implantitis	Clinical: PI, BOP, PD/Microbiological (peri-implantar subgingival microbiota samples) - baseline, 30, 90 days	RCT prospective, controlled, triple-blind - Probiotic group (mechanical therapy + probiotic)/Control group (mechanical therapy)	44 adults partially edentulous patients and implants with mucositis or peri-implantitis -	Lozenge - 30 days (once a day)	<i>Lactobacillus reuteri</i> DSM 17938 and ATCC PTA 5289 (1 x 10 ⁸ CFU each)
Mongardini et al., 2017 Experimental peri- implant mucositis	Clinical: PI, BOP - baseline, 2, 6 weeks	RCT cross-over controlled, double-blind Screening ->1 st induction disease phase (2weeks with acrylic stent to use during brushing) -> 1 st intervention phase (14 days)-> washout (28 days) -> 2 nd induction disease phase (14 days) -> 2 nd intervention phase (14 days) - Probiotic group and Placebo group	19 healthy patients with dental implant (1-13 years in function) - 39-78 years	Tablet - 14 days (once a day)	<i>Lactobacillus plantarum</i> , <i>Lactobacillus</i> <i>brevis</i>
Hallström et al., 2016 Peri-implant mucositis	Clinical: PD, BOP/Microbiological/ Immunological: levels of IL-1 β , IL-1RA, IL-4, IL-6, IL-8, IL-17A, CCL5, TNF- α , IFN- γ and GM-CSF - baseline, 1, 2, 4, 12, 26 weeks	RCT controlled, double-blind - Probiotic group and Placebo group	49 patients with peri-implant mucositis with one or more peri- implant sites with PD = 4 mm with bleeding and / or pus probing - 24-85 years	Oil topical application 1 time and lozenge - 3 months (twice a day)	<i>Lactobacillus reuteri</i> DSM 17938 and ATCC PTA 5289 (2 x 10 ⁷ CFU)
Flichy-Fernández et al., 2015 Peri-implant mucositis	Clinical: PI, PD, GI, PICF/Immunological: levels of IL-6, IL-8, IL-1 β - baseline, 1, 2, 8, 9, 10, 16, 17, 18 months	RCT cross-over prospective placebo-controlled, double-blind Prophylaxis (wait 1 month)-> intervention (1 month)-> prophylaxis (wait 6 months), new prophylaxis (wait 1 month)-> placebo -> prophylaxis (wait 6 months), new prophylaxis (2months), new prophylaxis - Group A: no peri-implant disease (22 patients, 54 implants)/Group B: with peri-implant mucositis (12 patients, 23 implants)	34 healthy non-smoking patients with at least one fully edentulous dental arch with rehabilitation on implant, prosthesis in function for at least 24 months - mean age 60 years	Tablet - 30 days (once a day)	<i>Lactobacillus reuteri</i> DSM 17938 (100 x 10 ⁶ active units) and ATCC PTA 5289 (200 x 10 ⁶ active units)