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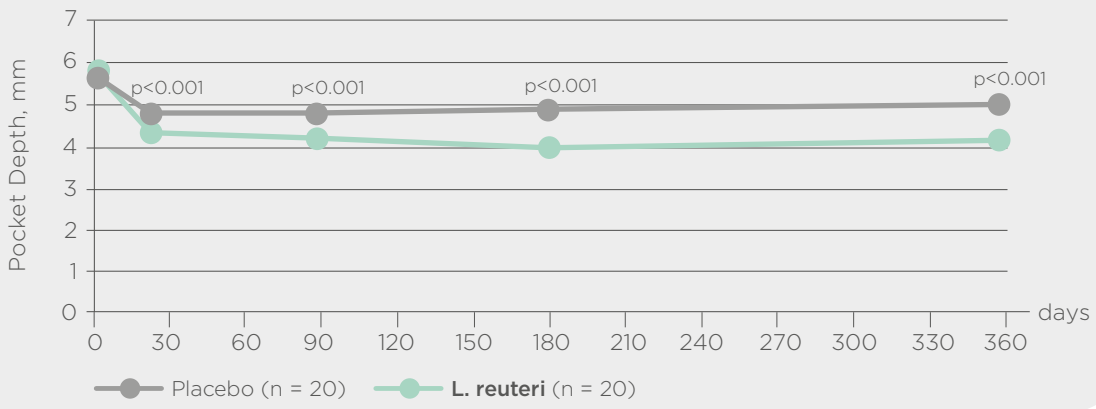
Clinical and biochemical evaluation of Lactobacillus reuteri-containing lozenges, as an adjunct to non-surgical periodontal therapy, in chronic periodontitis

Ince G, Gürsoy H, Ipçi ŞD, Cakar G, Emekli-Alturfan E, Yılmaz S.
J Periodontol. 2015;86:746-754.
doi:10.1902/jop.2015.140612

KEY RESULTS

(additional results of the Tekce et al. 2015 trial)

- Pocket Depth, plaque and gingival indices, and bleeding on probing were all significantly improved ($p<0.05$) compared to placebo, at all time points
- Significant changes up to day 180 of cytokines in gingival crevicular fluid : reduced MMP-8 and increased TIMP-1 levels ($p <0.05$)
- Attachment gain was significantly greater in the **L. reuteri** group compared with controls,
- On days 90, 180, and 360 ($p<0.001$)



CONCLUSION

Lozenges with **L. reuteri** Prodentis® may be a useful supplement in moderately deep pockets of patients with Chronic Periodontitis. Low MMP-8 and high TIMP-1 levels may indicate the role of the lozenges in reduction of inflammation-associated markers up to day 180.

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ADDITIONAL STUDY INFORMATION

- **Study design:** Prospective, randomized, double blind and placebo-controlled
- **Subjects:** 20 adults with Chronic Periodontitis, mean age 42 years
- **Dosage:** 2 lozenges daily (4 x 10^8 CFU/day)
- **Duration:** Probiotic supplementation for 21 days, initiated after periodontal therapy. Clinical and biochemical evaluation at baseline and days 21, 90, 180 and 360.
- **Primary endpoint:** Pocket Depth reduction
- **Secondary endpoints:** Changes in plaque index, gingival index, bleeding on probing, gingival crevicular fluid volume,attachment gain, and changes in MMP-8 (matrix metalloproteinase-8) and TIMP-1 (tissue inhibitors of matrix metalloproteinase-1). (The balance between these two cytokines are essential for the degradation and remodeling of the extracellular matrix proteins.)

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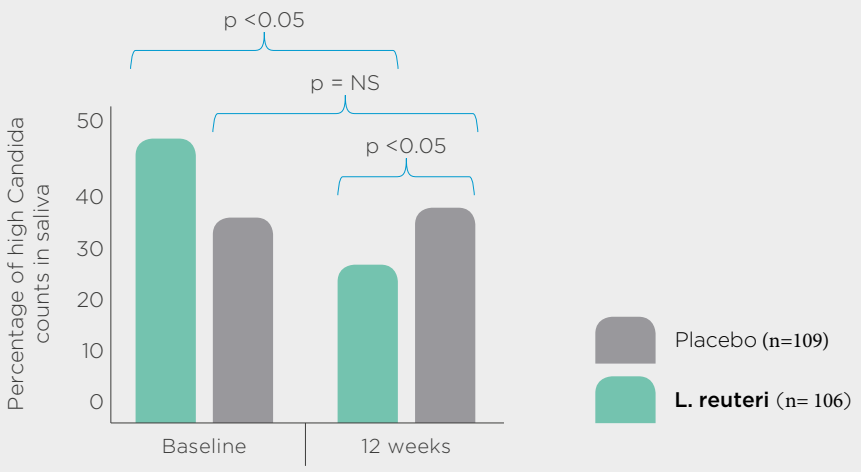
Effect of Probiotic bacteria on Oral Candida in Frail elderly

Kraft-Bodi E, Jørgensen M.R, Keller M.K, Kragelund C, Twetman S.
J Dent Res. 2015 Sep;94(9 Suppl):181S-6S.
doi: 10.1177/0022034515595950

KEY RESULTS

At 12 week follow-up:

- Prevalence of salivary Candida significantly reduced from 72% to 51% ($p<0.05$)
- in the **Lactobacillus reuteri** probiotic group; remaining unchanged in the placebo group (increasing from 66% to 79%).
- Same pattern observed in the plaque samples with a reduction from 67% to 50% in the **L. reuteri** probiotic group while no reduction in the placebo group.
- Statistically significant reduction in the proportion of high counts in saliva and plaque samples in the probiotic group and not in the placebo group ($p<0.05$).
- No significant differences concerning the levels of supragingival plaque or Bleeding on probing.



CONCLUSION

(...) the findings suggest that a daily use of probiotic lozenges could reduce the prevalence of high oral Candida counts in a group of frail elderly patients living in nursing homes. This indicates that probiotic supplements may be beneficial for patients at risk for oral candidosis.

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ADDITIONAL STUDY INFORMATION

- **Study design:** randomized double-blind placebo-controlled design
- **Subjects:** 215 subjects: older adults from 60 to 102 years old
- **Dosage:** 2 lozenges daily (1 morning and 1 evening)
- **Intervention period:** 12 weeks
- **Primary end-point:** prevalence of high Candida counts assessed from chairside tests
- **Secondary end-points:** levels of dental plaque and gingival inflammation

Study carried-out at the University of Copenhagen

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Clinical efficacy of probiotic as an adjunctive therapy to non-surgical periodontal treatment of Chronic Periodontitis: A systematic review and meta-analysis

Martin-Cabezas R, Davideau JL, Tenenbaum H, Huck O.
J Clin Periodontol. 2016;43:520–530.
doi: 10.1111/jcpe.12545

KEY RESULTS

The adjunctive use of the specific probiotic supplement **L. reuteri** Prodentis® resulted in significant additional PPD reductions in moderate and deep pockets, additional CAL gain and BOP reduction at short term.

Outcome improved*	Tekçe/Ince 2015 J Clin Periodontol	Teughels 2013 J Clin Periodontol	Vivekananda 2010 J Oral Microbiol
PPD, all pockets	**YES**	NS	**YES**
PPD, moderate and deep pockets	**YES**	**YES**	**YES**
CAL, all pockets	**YES**	NS	**YES**
CAL, moderate and deep pockets	NA	**YES**	**YES**
Bleeding on probing	**YES**	**YES**	**YES**
Need for surgery	**YES**	**YES**	NA

PPD: probing pocket depth
CAL: clinical attachment level

**Significant compared with placebo*
NS = Not Significant
NA = Not analyzed

CONCLUSION

"To date, only a few studies investigated the effect of adjunctive probiotics to Scaling and Root Planing (SRP) in the management of Chronic Periodontitis (CP), as it is an emerging potential therapeutic. (...) the findings of this meta-analysis seem to support the adjunctive use of **Lactobacillus reuteri** to SRP in Chronic Periodontitis treatment at short-term especially in deep pockets. This treatment protocol has shown similar results to other adjunctive treatments in Chronic Periodontitis treatment (...)."

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ADDITIONAL STUDY INFORMATION

FOCUSED QUESTION

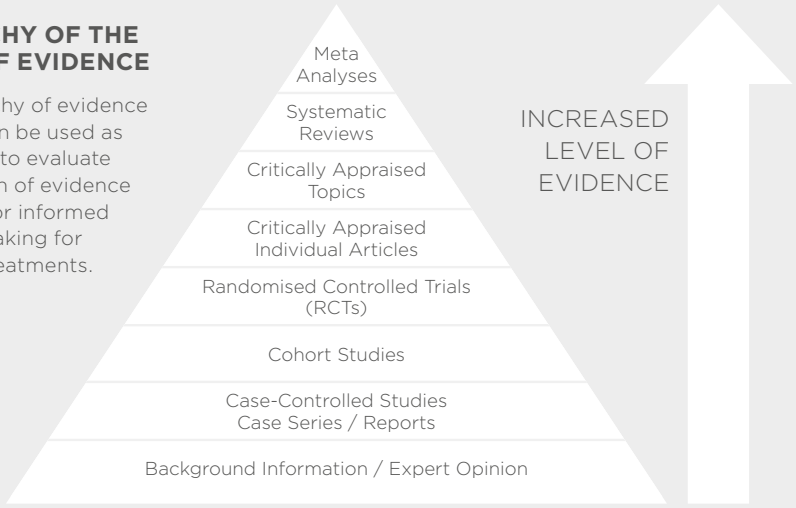
What is the clinical influence of probiotics as an adjunctive therapy of Scaling and Root Planing (SRP) when compared with SRP alone or in combination with placebo in the treatment of Chronic Periodontitis.

METHODS

Electronic databases were searched up to July 2015. Randomized controlled trials (RCTs) comparing SRP + probiotic versus SRP were included. PPD reduction and CAL gain were selected as primary outcome variables.

HIERARCHY OF THE LEVEL OF EVIDENCE

This hierarchy of evidence pyramid can be used as a guideline to evaluate the strength of evidence available, for informed decision making for different treatments.



- Meta-analyses are at the very top of the evidence hierarchy: a meta-analysis will thoroughly examine a number of valid studies on a topic and combine the results using accepted statistical methodology as if they were from one large study.
- The strength of the evidence decreases as one descends down the pyramid.

REFERENCES

- Owens DK. Analytic Tools for Public Health Decision Making. Med Decis Making, 2002;22 (5, Suppl.):S3-S10.
- Tomlin G, Borgetto B. Research Pyramid: A new evidence-based practice model for occupational therapy. American Journal of Occupational Therapy 2011;65:189–196.

Study carried out at the University of Strasbourg, Department of Periodontology.

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Regular consumption of Lactobacillus reuteri-containing lozenges reduces Pregnancy Gingivitis: an RCT

Schlagenhauf U, Jakob L, Eigenthaler M, Segerer S, Jockel-Schneider Y, Rehn M.
J Clin Periodontol. 2016;43:948–954.
doi: 10.1111/jcpe.12606

KEY RESULTS

The regular consumption of **L. reuteri**-containing lozenges during the third trimester of pregnancy was associated with a significant reduction of gingival inflammation and plaque coverage.

At follow-up, within two days after delivery:

- Gingival Index was categorized as 0 (no inflammation) in 79% and 37% respectively, of the subjects in the probiotic and placebo group.
- Gingival Index score was significantly reduced: 0.2 vs. 0.7, p<0.0001
- Plaque Index score was significantly reduced: 0.2 vs. 0.6, p<0.0001
- TNF-alfa in serum: no difference

CONCLUSION

In this observed cohort of healthy pregnant women, the regular consumption of **L. reuteri**-containing lozenges proved to be a valuable adjunct in the control of pregnancy associated Gingivitis being effective even in the intentional absence of concomitant professional plaque control and oral hygiene training. The consumption of **L. reuteri**-containing lozenges may be a useful adjunct in the control of Pregnancy Gingivitis.

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ADDITIONAL STUDY INFORMATION

- **Study design:** Prospective, randomized, double blind, placebo-controlled
- **Subjects:** 45 healthy women in the third trimester of pregnancy and with Gingivitis, adhering to their normal brushing habits
- **Dosage:** 2 lozenges daily (4 x 10^8 CFU/day)
- **Mean duration, until delivery:** 44 days
- **Primary endpoint:** Reduction in Gingival Index during the study period
- **Secondary endpoints:** Reduction in Plaque Index and serum levels of TNF-alfa

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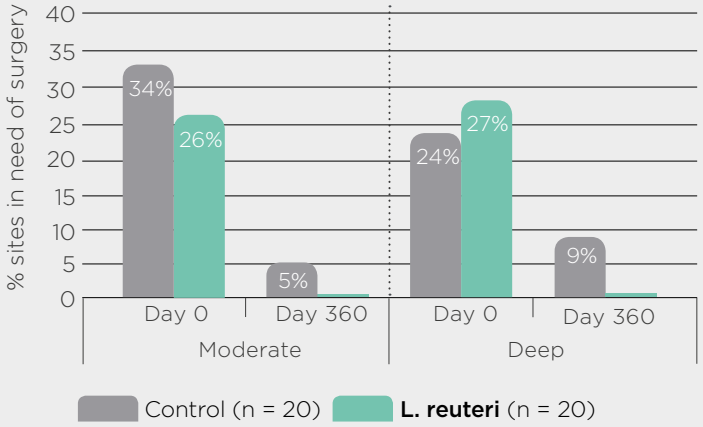
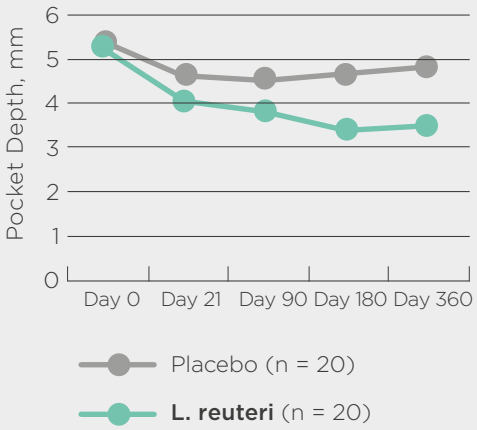
Clinical and microbiological effects of probiotic lozenges in the treatment of Chronic Periodontitis: a 1-year follow-up study

Tekçe M, Ince G, Gürsoy H, Ipçi SD, Cakar G, Kadir T, Yilmaz S.
J Clin Periodontol. 2015;42:363-372.
doi:10.1111/jcpe.12387

KEY RESULTS

- At all time-points from day 21 until day 360, **Lactobacillus reuteri** Prodentis® was significantly better than placebo ($p<0.05$) in terms of Gingival Index, Plaque Index, Bleeding upon Probing and Pocket Depth.
- Recolonization of pathogenic bacteria was significantly more delayed in the active group compared to placebo at days 21, 90, and 180 ($p<0.05$).
- In the active group, significantly fewer patients required surgery of ≥3 sites.





CONCLUSION

Lactobacillus reuteri-containing lozenges were a useful adjuvant agent to delay recolonization and improve clinical outcomes of Chronic Periodontitis.

LACTOBACILLUS REUTERI Prodentis® CLINICALLY PROVEN

ADDITIONAL STUDY INFORMATION

- **Study design:** randomized, double blind, placebo-controlled clinical trial
- **Subjects:** 40 adults with Chronic Periodontitis and horizontal bone loss, and treated with scaling and root planing (SRP)
- **Dosage:** 1 lozenge twice daily (4 x 10^8 CFU/day)
- **Duration:** 3-week intervention, with evaluation at days 21, 90, 180, 360
- **Primary endpoint:** reduction in Pocket Depth
- **Secondary endpoint:** patients in need of surgery defined as PD ≥6 mm, or 5 mm and bleeding on probing