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COMMENT

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Periodontics

# Does the use of antimicrobials in different periodontal treatment strategies result in better treatment outcomes? – A radiographic analysis

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**A COMMENTARY ON**
**Kubberød J O, Torgersen G R, Gjermo P, Baelum V, Preus H R.** Five-year radiological findings from a randomised controlled trial of four periodontitis treatment strategies. *Eur J Oral Sci* 2023; https://doi.org/10.1111/eos.12949.

**PRACTICE POINTS**

- A combination of clinical assessment (periodontal probing depths, clinical attachment loss, plaque/bleeding scores) and appropriate radiographic examinations should be used to assess a patient's periodontal disease.
- The use of adjunctive systemic antimicrobials is not routinely recommended in treatment of periodontal disease.
- The results of this study should be validated through further research.

**DESIGN:** The paper by Kubberød *et al.* is a single-centre, double-blinded, prospective randomised control trial, comparing the radiographic alveolar bone levels in patients with periodontal disease following different treatment protocols over a 5-year period. In total, 184 patient were recruited to the study, and 161 (87.5%) of the patients returned for follow up over a 5-year period. The patients underwent a 3-month, pre-treatment oral hygiene phase before being randomised to one of 4 treatment regimens: (i) same day full mouth disinfection + adjunctive metronidazole; (ii) same day full mouth disinfection + placebo; (iii) scaling and root planing + adjunctive metronidazole; (iv) scaling and root planing + placebo. Scaling and root planing was carried out over a period of 2 to 4 weeks. The participants were enroled in maintenance treatment at 3, 6 and 12 months, then bi-annually for 5 years following active treatment. Radiographic recordings were taken at baseline pre-treatment and then at the 5-year follow up examination. Clinical periodontal measurements such as plaque/bleeding scores, and PPD/CAL (in mm) were also recorded pre/post-treatment.
**CASE SELECTION:** Participants for this study were recruited over 2 years from referrals to a specialist periodontal clinic in Norway. The patients were aged between 35–75 and at the time of inclusion into the trial, had no systemic conditions relevant to periodontitis. The participants underwent a 3-month pre-treatment oral hygiene phase to attempt to reduce the risk of false pocketing at the initial baseline measurements. For inclusion into the trial, participants were required to have more than 5 persistent sites of PPD > 5 mm, and < 15% plaque sites following the pre-treatment hygiene regime. Participants were also only eligible if there were no known reactions to metronidazole or known to carry microorganisms resistant to metronidazole.
**DATA ANALYSIS:** Bland-Altman plots were used to allow for assessment of the reproducibility of the radiographic measurement carried out for the examiner assessing the radiographs. Linear regression was used to describe the degree of bone loss noted over the 5-year period.
**RESULTS:** Firstly, the authors describe the radiographic examiners results from the Bland-Altman plots, which shows the examiner to have an error range of −0.04 to 0.01 mm in 95% of cases with the error intervals (−0.47,0.40), (−0.60,0.54) and (−0.55,0.56). Secondly, the authors present the number of periodontal pocket sites (interproximal) examined at the base and at the 5-year follow up. The average number of sites with readings for RBL, CAL and PPD at base line averaged from 41.2 and 43.7 depending on the treatment arm. This was lower at the 5-year follow up, between 30.2 and 36.9. The number of sites with no data (indicating loss of tooth) also increased from baseline to the 5-year follow up, from 4 to 13. Lastly, the results show the change in RBL, CAL and PPD from baseline to 5-year follow up, post-treatment for all 4 treatment protocols. This shows that metronidazole in conjunction with mechanical debridement has a small but statistically insignificant positive effect on RBL and CAL gain. Full mouth disinfection was found to result in less reduction in PPD compared with scaling and root planing; however, this was also found to be statistically insignificant.
**CONCLUSIONS:** Regardless of the treatment protocol, all patients demonstrated a reduction in PPD. The FDIS+MTZ group had no statistically significant change in the RBL. However, the other treatment regimens showed overall bone loss over the 5-year period,

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Received: 17 December 2023 Accepted: 19 December 2023
Published online: 17 January 2024

which again is statistically unimportant. Overall, the authors conclude that resolution of periodontitis induced inflammation is better observed through clinical measurements of the soft tissues, such as PPD and CAL, versus radiographic examination. This was particularly evident as the discrepancies between RBL and CAL were largest for shallower PPDs.

*Evidence-Based Dentistry* (2024) 25:31–32; https://doi.org/10.1038/s41432-024-00972-1

**GRADE Rating**: ●●●○

## COMMENTARY

This paper by Kubberød *et al*. is an interesting work examining the effects on the radiological changes to the alveolus following different treatments for periodontal disease, specifically the use of adjunctive metronidazole.

The trial was sufficiently blinded during treatment and examination. The use of a single clinician carrying out the treatment and a single interpreter for the radiographic analysis aided in reducing variables in operator technique.

The cohort for this study was 161 patients in a single centre study. To further improve this study going forward, a larger scale, multi-centre trial to collate further data would be ideal. The authors do not mention the mean age of participants or any other demographics. This would be interesting to examine also for further research.

The guidelines for dental professionals in the UK for periodontal assessment and treatment have been revised in recent years. Namely, the British Society of Periodontology released the UK version of the "S3 Treatment Guidelines for Periodontitis"[1] and the Scottish Dental Clinical Effectiveness Programme has previously published "Prevention and Treatment of Periodontal Diseases in Primary Care"[2]. In these guidelines, unlike in Norway where this study was conducted, dentists are not required to take full mouth radiographs pre/post treatment for all patients undergoing periodontal treatment. The use of systemic antibiotics, such as metronidazole, is also not routinely recommended for periodontal treatment, unless in the acute scenario with systemic symptoms[2]. In addition, treatment strategies for periodontal disease in the S3 Treatment guidelines recommend PMPR (Professional Mechanical Plaque Removal) as the primary treatment, and although not opposed to full mouth disinfection, do not recommend it as the primary treatment modality.

In summary, this trial is specific in nature to the Norwegian dental system due to the availability of pre/post treatment radiographs for all patients. The takeaway points from this work are, that the use of adjunctive antimicrobials in periodontal treatment show only to have a minute effect on the treatment outcomes both clinically and radiographically, and this is acknowledged by the authors.

## REFERENCES

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## COMPETING INTERESTS

The author declares no competing interests.

## ADDITIONAL INFORMATION

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