Narrow-diameter implants: A systematic review and meta-analysis.

Abstract
OBJECTIVES: Narrow-diameter implants (NDI) are claimed to be a reasonable alternative to bone augmentation procedures. The aim of this comprehensive literature review was to conduct a meta-analysis comparing the implant survival of NDI and standard diameter implants (SDI) and to provide recommendations and guidelines for application of NDI.

MATERIAL AND METHODS: An extensive systematic literature search was performed in the PubMed/MEDLINE and the Cochrane Library databases. NDI were classified into Category 1 (implant diameter <3.0 mm, "mini-implants"), Category 2 (implant diameter 3.0-3.25 mm) and Category 3 (implant diameters 3.3-3.5 mm). Clinical studies at all levels of evidence with at least 10 patients included and a follow-up time of at least 12 months were included. The primary outcome criterion was the survival rates of NDI.

RESULTS: Seventy-six studies were identified for qualitative and 16 studies for quantitative synthesis. Quality assessment illustrated a high risk of bias for the included literature. Mean implant survival rates were 94.7 ± 5%, 97.3 ± 5% and 97.7 ± 2.3% for Categories 1, 2 and 3. Meta-analysis indicated a statistically significant lower implant survival of Category 1 NDI compared to SDI ([OR], 4.54; [CI], 1.51-13.65). For Category 2 and Category 3, no statistically significant differences in implant survival were seen compared to SDI ([OR], 1.06; [CI], 0.31-3.61 and [OR], 1.19; [CI], 0.83-1.70).

CONCLUSION: NDI of Category 1 performed statistically significantly worse than SDI and were mainly described for the rehabilitation of the highly atrophic maxilla or mandible. Category 2 and Category 3 NDI showed no difference in implant survival compared to SDI. Category 2 NDI were mostly used for the rehabilitation of limited interdental spaces in anterior single-tooth restorations. NDI of Category 3 were described in all regions, including posterior single-tooth restorations. However, resilient long-term data and data on the possible risk of biological and technical complications with wide platform teeth on NDI are missing so far.

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