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study

How old is 'old' for implant therapy in terms of early implant losses?

Authors:

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Background

One in five of the European population is aged over 65 and 6% is aged over 80 years. With an ageing population in Europe, these percentages are set to grow in the future.

Dental implants can improve health-related quality of life, especially for patients with several missing teeth. Therefore, the elderly will represent a large proportion of patients seeking dental-implant therapy.

The elderly often receive medication and may have comorbidities that affect bone healing. Therefore, it can be hypothesised that the osteointegration process during the early stage of healing following dental implant placement is negatively impacted in the elderly.

The current literature has shown equivalent implant survival rates in the elderly and younger population at one year and 10 years after placement. However, data on early implant loss (EIL) — defined as a lack of osseointegration prior to or at the time of prosthetic restoration — are lacking in the elderly population.

Aims

The aim of this study was to compare the EIL rate between an elderly patient cohort (65 years and above at the time of implant placement) and a matched younger patient cohort (aged between 35 and 55 years when implants were placed).

Materials & methods

This retrospective cohort study used dental records from the Medical University of Vienna covering 11.5 years (2005-2016). EIL was the primary outcome.

Patients aged 65 years or more at the time of implant placement were recruited. The following parameters were included in the analysis:

- age,
- gender,
- implant site,
- bone augmentation,
- smoking status,
- history of periodontitis,
- presence of diabetes mellitus, osteoporosis or rheumatoid arthritis,
- intake of various medications including statins, selective serotonin reuptake inhibitors, anticonvulsants, and anticoagulants.

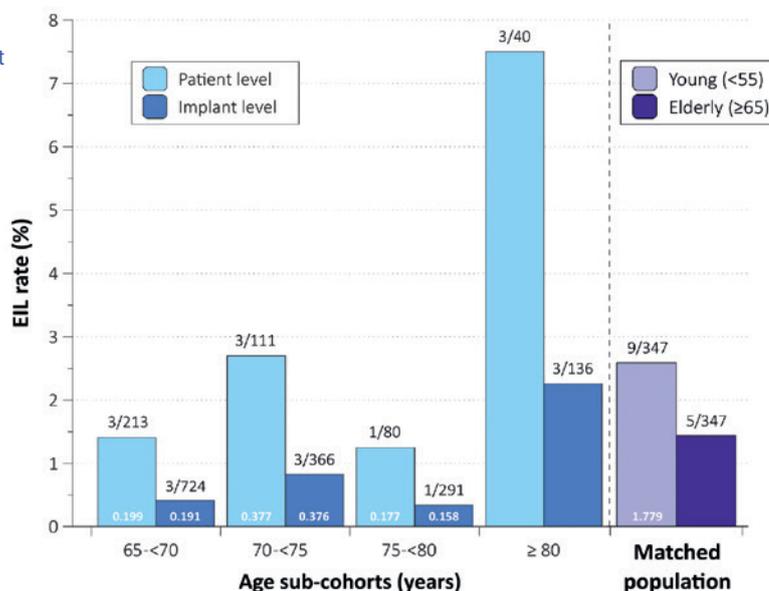
One implant per elderly patient was matched to an implant placed in a younger patient, based on gender, implant region, bone augmentation, and smoking status. Immediate/delayed placement, implant dimension, implant type, connection type, antibiotic prescription, submerged/non-submerged healing, and reimplantation at later time points were recorded for each EIL case found.

The cohort was split in eight sub-groups: 35–<40, 40–<45, 45–<50, 50–<55, 65–<70, 70–<75, 75–<80, and ≥80. Categorical variables were assessed using a chi-square test in the elderly patients (both those with and those without EIL), between the matched cohorts, and across the age subgroups. Differences were reported at patient and at implant level. A multivariate logistic regression analysis was applied to identify the factors associated with EIL.

Figure

EIL rate (%) on the patient (light blue) and implant (dark blue) level in the elderly patient cohort (n = 444), divided into 4 sub-cohorts. The matched population (young patient cohort is displayed in light purple, elderly patient cohort in dark purple) consisted of 347 patients contributing with one implant each. The numbers on top of the bars present the actual numbers of EIL out of the total numbers of patients/implants, and the white numbers inside the bars represent the relative risk for EIL compared to the sub-cohort of patients ≥ 80 years of age or compared to the matched elderly patient cohort, respectively.

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Results

- 444 patients with 1,517 dental implants were included in the elderly patient group. Of these, 347 patients were matched for analysis with 347 patients in the younger population.
- Significant differences were found between the elderly group and the younger group in terms of history of periodontitis, systemic disease (diabetes mellitus, osteoporosis, rheumatoid arthritis), and regular medication intake.
- In the elderly patient group, the EIL rate was 0.66% and 2.25% at implant and patient level respectively (10 patients had one EIL each).
- The EIL rate in the four elderly-patient sub-groups was:
 - 65-70 (n = 213): 0.41% (implant level), 1.41% (patient level).
 - 70-75 (n = 111): 0.83%, 2.7%.
 - 75-80 (n = 80): 0.34%, 1.25%.
 - ≥ 80 (n = 40): 2.26%, 7.50%.
- No statistically significant difference was identified between the ≥ 80 years sub-group and the other elderly sub-groups in terms of EIL rate at implant and patient level.
- The percentage of systemic diseases and medication intake was significantly higher among elderly patients.
- The EIL rate between matched elderly and younger patient groups did not differ significantly.
- A weak trend between increasing age and the EIL rate was found ($p = .09$).

Limitations

- The retrospective design of the study.
- Several confounding factors were difficult to control.
- Cut-off age (<55 or ≥ 65 years old) between elderly and younger groups might be too low.
- Elderly patients who request implant treatment might not represent the average elderly population because they are generally healthier.
- The number of participants in both groups might need to be increased because EIL rates per sub-group are low.

Conclusions & impact

- There is no evidence of a higher rate of EIL in patients aged 65 or more than in younger patients (35 to 55). Only patients aged 80 or more may have a slightly higher risk of EIL.
- Ageing does not seem to disrupt osseointegration at an early stage of healing after implant placement, therefore age should not be considered as a limiting factor for implant therapy.
- Prospective studies are needed to confirm these results.

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