Taste and food intake in older adults

Oral health and malnutrition

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Oral health and Nutrition

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Learning objectives

01
Know the main reasons for impaired oral health with ageing

02
Know the consequences, especially nutritional, of impaired oral health

03
Know the principles of oral healthcare in the prevention of malnutrition
More older people retaining their teeth until high age

Figure 7. Number of existing teeth (excluding edentulous individuals). Means in the different age groups in 1973, 1983, 1993 and 2003 [Hugoson et al. 2005].

Muller, F. Naharro, M, Carlsson, GE. What are the prevalence and incidence of tooth loss in the adult and elderly population in Europe?, Clin Oral Implants Res, 2007: 2-14
Poor oral health in LTC institutions
What are the consequences of poor oral hygiene on oral health?
Dental plaque
Plaque on the tongue

Diminished taste

Halitosis!
1 Oral biofilm

2 Inflammation

Gingivitis
Gingivitis
1. Gingivitis

2. Bone loss (irreversible)

2. Periodontitis,
   Attachment loss
   Bone loss
   Tooth loss
Periodontitis
Caries
Root caries
Root caries
Nutrition and its effect on tooth mineralisation and Caries

- Sugar intake (WHO Advise 2015: < 25 g/day)

- Lack of Vit D, Calcium, phosphates, Vit K: negative impact upon tooth mineralisation and tooth quality and quantity and may also affect caries risk in later life through other mechanisms


- Dental caries and periodontal diseases are a sensitive alarm bell for an unhealthy diet

  (Hupoel, 2017)
Periodontal disease and nutrition

- Change of nutritional intake habits
- Inverse relation between dietary fiber intake and periodontal disease
- Periodontal disease is associated with low whole-grain intake but not with low fruit and vegetable intake
- Diary calcium, particularly from milk and fermented products may protect against periodontal disease

Nutrient deficiencies and periodontal disease


Review article

Association of some specific nutrient deficiencies with periodontal disease in elderly people: A systematic literature review


Zorgcentrum Amersfoort Medical Centre, Amersfoort, The Netherlands

Manuscript received January 1, 2008; accepted January 5, 2009

Abstract

Objective: Deficiency of vitamin A, B complex, vitamin C, vitamin D, calcium, and magnesium has been associated with periodontal disease. This article systematically reviews the currently available literature on the feasible association of vitamin B complex, vitamin C, vitamin D, calcium, and magnesium deficiencies with periodontal disease in elderly people.

Methods: We performed a systematic review of relevant English- and Dutch-language medical literature published from January 1990 to May 2007, with critical appraisal of those studies evaluating the association of vitamin B complex, vitamin C, vitamin D, calcium, and magnesium deficiencies with periodontal disease in elderly people.

Results: None of the studies meeting the selection criteria included institutionalized elderly people. In the studies on non-institutionalized elderly people, no significant or consistent association was found between vitamin B complex, vitamin C, vitamin D, calcium, and magnesium dietary intakes and serum levels and periodontal disease. Although in those studies decreased dietary vitamin C intake was found to be associated with increased risk of periodontal disease, no conclusive evidence could be demonstrated.

Conclusion: There is no evidence of an association of vitamin B complex, vitamin C, vitamin D, calcium, and magnesium deficiencies with periodontal disease in non-institutionalized elderly people. To
Calcium, Vit D and tooth loss

The American Journal of Medicine
Volume 111, Issue 6, 15 October 2001, Pages 452–456

Clinical study

**Calcium and vitamin D supplements reduce tooth loss in the elderly**

Elizabeth A Krall, PhD • a, b, , Carolyn Wehler, RDH, BS a, Raul I Garcia, DMD a, c, Susan S Harris, DSc b, Bess Dawson-Hughes, MD b

**Conclusion**

These findings suggest that intake levels of calcium and vitamin D aimed at preventing osteoporosis have a beneficial effect on tooth retention.
Probiotics and oral health

Effective on (?
- Caries
- Gingivitis
- Periodontitis
- Halitosis
Oral manifestations of vitamin deficiency

- Gum swelling
- Bleeding
- Geographic tongue
- Smooth tongue
- Vit C, Vit 12, Folate, Iron, Zinc
Why is retaining teeth as long as possible important?
Dental status and chewing efficiency

The results of animal and human experimental studies suggest a causal correlation between mastication and cognition.
## Dental status and nutrition intake in older people

<table>
<thead>
<tr>
<th></th>
<th>Edentate n=287</th>
<th>1-10 teeth n=131</th>
<th>21+ teeth n=123</th>
<th>Significance level</th>
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<tbody>
<tr>
<td>Energy (Kcal)</td>
<td>1583</td>
<td>1700</td>
<td>1842</td>
<td>0.002</td>
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<tr>
<td>Protein (g)</td>
<td>60</td>
<td>66</td>
<td>71</td>
<td>0.02</td>
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<td>Fat (g)</td>
<td>64</td>
<td>67</td>
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<tr>
<td>Non-starch Polysaccharide (g)</td>
<td>11</td>
<td>13</td>
<td>16</td>
<td>0.001</td>
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<tr>
<td>Calcium (mg)</td>
<td>722</td>
<td>825</td>
<td>884</td>
<td>0.002</td>
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<td>Vitamin C (ug)</td>
<td>60</td>
<td>82</td>
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<td>Vitamin E (ug)</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>0.07</td>
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<tr>
<td>Total carbohydrate (g)</td>
<td>209</td>
<td>215</td>
<td>226</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Sheiham et al. J Dent Res, 2001, 80(2); 408-413
Dental status and mortality

Tooth loss an early indicator of accelerating ageing?

Figure 1. Twenty-one-year survival in 70-year-olds (A) with and without teeth and (B) according to number of teeth. Comparisons of survival by log-rank tests.
Other consequences of Tooth loss

- Speaking problems
- (partial) Dentures
- Chewing problems
- Swallowing problems

- Mineral and vitamin deficiencies
- Decreasing BMI and malnutrition

- Diminished cognition
- Shorter life
What about people with dentures?
Denture problems
Pressure ulcer
Pressure ulcer?!
Association between malnutrition and oral health in Dutch Nursing Home Residents

Results of the LPZ study

Huppertz VAL, van der Putten GJ, Halfens RJG, Schols JMGA, de Groot CPGM
Population characteristics (n= 3220)

- 65-105 yrs
- 70.2 % women; 65.2 PG wards
- Malnutrition in 11.7 %
- Poor oral health in 44.5%
  - Teeth problems: 10.1%
  - Chewing problems: 25.6%
  - Xerostomia: 28.6%
- More malnutrition with OHP
Conclusion

Poor Oral Health – mostly problems with eating due to denture problems – is associated with an almost twofold risk for malnutrition in older residents in Dutch Nursing Homes.
Take home messages

• It is important to keep at least 21 teeth as long as possible

• Inadequate nutritional intake increases the risk of oral diseases

• Poor oral health have a negative impact on nutrition and vitamin intake

• In the prevention of malnutrition, more attention is needed for oral health
Thank you for your kind attention

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