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Study:



The effect of periodontal status and occlusal support on masticatory performance: the Suita study

Kosaka T, Ono T, Yoshimuta Y, Kida M, Kikui M, Nokubi T, Maeda Y, Kokubo Y, Watanabe M, Miyamoto Y.
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Relevant background to study:

Several risk factors such as tooth loss, occlusal support and maximum “bite force”, have been demonstrated to directly affect masticatory ability. Decrease in masticatory ability adversely affects nutritional intake and negatively impacts upon quality of life. Previous studies have shown that

periodontal tissue destruction may also reduce masticatory ability. However, few studies have investigated this issue, taking into account occlusal support especially in elderly patients with a reduced number of teeth.

Study Aims:

To evaluate the influence of periodontal status on masticatory performance in dentate subjects with

identical areas of occlusal support.

Methods:

This prospective cohort study recruited 1839 elderly patients (67.2 ± 7.9 years) selected randomly from the Suita study that was established to promote prevention of cardiovascular diseases in Japan. Number of functional teeth and occlusal support were evaluated using the “Eichner index” (A1-3, B1-4, C1-3 groups). Periodontal status was assessed using the Community Periodontal Index (CPI), coded from 0 to 4, by means of partial

mouth recording (10 index teeth). Masticatory performance was objectively evaluated by optical density measurement of the glucose concentration released from a “gummy jelly” and correlated with the surface area of the masticated test jelly. Results were adjusted for age and gender. Subjects for whom masticatory performance could not be accurately measured were excluded.

Results:

- A large number of enrolled subjects were classified as Eichner A1 (n=653) without missing teeth and with occlusal contacts in all posterior areas. In this group, 54.1% of subjects had no periodontal pockets (CPI = 0-2).
- Teeth with periodontal pockets (CPI ≥ 3) represented 30% of the Eichner A1 group while this proportion increased to 70% in Eichner B3 group (occlusal contacts in one posterior area).
- In Eichner groups A1 and B3, patients with moderate and severe periodontitis (CPI = 3-4) showed reduced masticatory performance in comparison with those without periodontitis (CPI = 0-2). No significant differences were highlighted in other Eichner A and B groups.

- The proportion of subjects wearing dentures increased from Eichner A2 group (8.3%) to Eichner B4 group (93.4%) and associated with a significant decrease of occlusal support.
- Masticatory performance of denture wearers from Eichner B2 and B3 groups decreased respectively in subjects with moderate periodontitis (B2) and in subjects with moderate and severe periodontitis (B3) in comparison with those without periodontitis.
- When only non-denture wearers were considered, no significant differences in masticatory performance was observed in Eichner A2 to B3 groups according to periodontal status.

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**Conclusions,
impact and
limitations:****Conclusions:**

- Worsening of periodontal status affects masticatory performance in elderly people.
- The influence of periodontal status upon masticatory performance could be observed in patients without tooth loss and also in denture wearers.

Limitations:

- Periodontal status was only evaluated on the basis of CPI and by means of partial mouth recording, and the latter is known to underestimate disease prevalence. A more precise evaluation of periodontal parameters including bleeding on probing, clinical attachment and bone levels, and mobility would provide additional data related to inflammatory status, periodontal diagnosis and their influence on masticatory performance.

Practical considerations:

- Periodontal screening and treatment associated with prosthetic rehabilitation in elderly subjects may improve masticatory performance and consequently lead to a better quality of life.
- Due to the random selection of patients, discrepancies among the sample size of each Eichner groups led to low statistical power for small sample sized groups
- No data were provided regarding alveolar ridge or denture quality in subjects with tooth loss. Such parameters may have affected the evaluation of masticatory performance