Characteristic of dental care received by smokers in Japan

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Background

✦ Numerous epidemiological studies have shown that smokers more frequently have dental diseases than non-smokers.

✦ Our research question is whether characteristics of dental care received by current smokers and non-smokers differ.
Objective

To evaluate the characteristics of dental care of smokers in Japan,

◆ we investigated smoking status and treated disease among patients who visited dental clinics.
◆ we compared the distribution of treated disease between current smokers and non-smokers.
Dental clinic survey

Survey design

- One day survey
- Questionnaire survey

Members of the Japan Dental Association, 65,329 dentists

1,022 dentists randomly selected

753 dentists (response rate; 73.7%)

14,187 patients

2,912 patients excluded because of incomplete information

1,590 former smokers excluded

9,685 patients

2,835 current smokers

6,850 non-smokers
## Category of dental care

<table>
<thead>
<tr>
<th>Category of dental care</th>
<th>Treated disease and encounter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gingival/periodontal treatment</td>
<td>Early stage: Gingivitis</td>
</tr>
<tr>
<td></td>
<td>Advanced stage: Mild to moderate periodontal disease</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Advanced stage: Severe periodontal disease</td>
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<tr>
<td>Caries/endodontic treatment</td>
<td>Early stage: Dental caries</td>
</tr>
<tr>
<td></td>
<td>Advanced stage: Endodontic disease</td>
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<tr>
<td></td>
<td>Inflammation of dental pulp</td>
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<tr>
<td></td>
<td>Apical periodontitis</td>
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<tr>
<td></td>
<td>Periapical abscess and radicular cyst</td>
</tr>
<tr>
<td>Prosthetic treatment</td>
<td>Prosthetic treatment</td>
</tr>
<tr>
<td>Periodical check-up/orthodontic treatment</td>
<td>Dental examination</td>
</tr>
<tr>
<td></td>
<td>Orthodontic treatment</td>
</tr>
<tr>
<td>Other treatments/encounters</td>
<td>Other periodontal diseases</td>
</tr>
<tr>
<td></td>
<td>Other disorders of teeth and supporting structures</td>
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<tr>
<td></td>
<td>Other diseases of the oral region, salivary glands and jaws</td>
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<tr>
<td></td>
<td>Stomatitis and related lesions</td>
</tr>
<tr>
<td></td>
<td>Dental injuries</td>
</tr>
</tbody>
</table>
Analyses

- The analyses consisted of two phases.

- Phase 1 analysis compared the distribution of 5 categories of dental care by smoking status using chi-square test.

- Phase 2 analysis compared the level of treatment stage in gingival/periodontal treatment and caries/endodontic treatment by smoking status using logistic regression models.

- A potential effect of cluster sampling by dentists was adjusted.
Distribution of the treated diseases

- Gingival/periodontal treatment
- Caries/endodontic treatment
- Prosthetic treatment
- Periodical check-up /orthodontic treatment
- Other treatments/encounters

**Non-smokers (N=6850)**
- 28.8% Gingival/periodontal treatment
- 43.6% Caries/endodontic treatment
- 20.3% Prosthetic treatment
- 2.7% Periodical check-up /orthodontic treatment
- 4.6% Other treatments/encounters

**Current smokers (N=2835)**
- 27.7% Gingival/periodontal treatment
- 47.1% Caries/endodontic treatment
- 19.0% Prosthetic treatment
- 1.6% Periodical check-up /orthodontic treatment
- 4.7% Other treatments/encounters

P-values:
- P<0.001
- P=0.022
- P=0.001
- n.s.
Proportion of advanced stage in gingival/periodontal treatment

<table>
<thead>
<tr>
<th>Age Group</th>
<th>NS</th>
<th>CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-39 years</td>
<td>4.4%</td>
<td>4.1%</td>
</tr>
<tr>
<td>40-59 years</td>
<td>15.3%</td>
<td>24.9%</td>
</tr>
<tr>
<td>≥60 years</td>
<td>22.1%</td>
<td>40.8%</td>
</tr>
</tbody>
</table>

AOR: odds ratio adjusted for gender

<table>
<thead>
<tr>
<th>Age Group</th>
<th>AOR</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-39 years</td>
<td>0.81</td>
<td>(0.30-2.91)</td>
<td>n.s.</td>
</tr>
<tr>
<td>40-59 years</td>
<td>1.67</td>
<td>(1.10-2.56)</td>
<td>P=0.001</td>
</tr>
<tr>
<td>≥60 years</td>
<td>2.25</td>
<td>(1.62-3.11)</td>
<td>P&lt;0.001</td>
</tr>
</tbody>
</table>

NS: Non-smokers, CS: Current smokers
Proportion of advanced stage in caries/endodontic treatment

<table>
<thead>
<tr>
<th></th>
<th>NS</th>
<th>CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>49.2%</td>
<td>54.1%</td>
</tr>
</tbody>
</table>

AOR: 1.39 (1.19-1.62)

P < 0.001

NS: Non-smokers, CS: Current smokers
AOR: odds ratio adjusted for age and gender
Our main finding

◆ The characteristic of dental care received by current smokers and non-smokers differed.

◆ Current smokers showed significantly higher distribution of endodontic treatment, and lower distribution for periodical check-up/orthodontic treatment than non-smokers.

◆ In the age groups of ≥40 years, current smokers more likely received gingival/periodontal treatment for the advanced stage of disease than non-smokers.

Current smokers receive less preventive and more intensive dental care than do non-smokers
Impact of smoking on dental care

Continuing smoking

Direct effects of smoking
Advances in dental diseases

Unhealthy behavior of smokers
Delayed dental care

Development of destruction of tooth supporting structure
Increased severe periodontal treatment in smokers
Development of destruction of tooth structure
Increased endodontic treatment in smokers

Increase of intensive dental care

Increase of dental care expenditures
Conclusion

- Current smokers receive less preventive and more intensive dental care than do non-smokers, suggesting that smoking increases dental care expenses in smokers.

- Smoking cessation intervention in dental practices may reduce the excess dental care and its cost associated with smoking.