An Epidemiologic Examination on the Prevalence of the Periodontal Diseases and Oral Pigmentation in Yusho Patients in 2002

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Abstract
An epidemiologic examination was carried out to reveal the prevalence of the periodontal diseases and oral pigmentation in patients with Yusho.

The results obtained were as follows.
1) 95 patients out of 110 patients, who were examined periodontal pocket depth using Ramfjord' methods, had at least one tooth with periodontal pocket deeper than 3 mm. Similarly, 276 teeth out of a total 495 examined teeth showed periodontal pockets with more than 3 mm depth. However, the ratio of the teeth with periodontal pockets deeper than 4mm to total examined teeth in each age fell to less than 25%.

2) Oral pigmentation was observed in 75 patients out of 121 patients with Yusho. In this examination, gingival pigmentation was most predominant among oral pigmentation. It is of particular interest that severe pigmentation tended to be observed at a much higher frequency in younger patients with Yusho.

Taken these findings into consideration, it was suggested that PCBs and related compounds might play an important role in the development of both periodontal diseases and oral pigmentation.

Introduction
To investigate the effects of PCBs and related compounds on oral lesions, follow-up study had been carried out at the annual health examination for Yusho patients. As the results, it had been proved that oral pigmentation was one of the prominent features of oral lesions. In addition, many Yusho patients were demonstrated to be involved in marginal periodontal diseases.

We reported here the prevalence of oral lesions, especially marginal periodontal diseases and oral pigmentation, in Yusho patients who visited the annual examination in 2002.

Methods
After asking chief complaint and a thorough dental history, visual examination, radiographic examination and also measuring of the periodontal pocket depth were
performed on Yusho patients who visited dentistry at the annual health examination at Fukuoka prefecture. The periodontal pocket depth at the mesio-buccal site of six teeth (upper right first molar, upper left central incisor, upper left first premolar, lower right first premolar, lower right central incisor and lower left first molar) was measured by use of the pocket probe (PCP-11) with light pressure and teeth with periodontal pocket deeper than 3mm were recorded.

**Results**

52 male patients and 69 female patients had the dental examination. Some patients complained of periodontal diseases such as gingival swelling, feeling of tooth extrusion, and also dentures not suitable for occlusion. However, no patients complained of esthetic problem caused by oral pigmentation.

Periodontal pocket examination carried out in 110 patients (48 males and 62 females) excluding patients who had no tooth for pocket examination. The distribution of periodontal pockets deeper than 3mm was shown in the Table 1. It was determined that 95 patients (86.4%) had at least one tooth with a periodontal pocket deeper than 3mm. In addition, 276 teeth out of total 495 examined teeth had a periodontal pocket deeper than 3mm (Table 2). Periodontal pockets deeper than 3mm were most prevalent in the upper left first premolars followed by lower right first premolars, upper right first molars and lower left first molars in turn. As compared to premolars and molars, lower and upper central incisors seemed to show less prevalence of periodontal pockets deeper than 3mm in percentage. However, there were no definitive differences of prevalence among each tooth. A chronological examination revealed that prevalence of periodontal pockets deeper than 3mm was higher in the aged patients than that in the young patients (Fig. 1). Similarly, prevalence of periodontal pockets deeper than 4mm increased in the age related manner and 55 patients had at least one tooth with a periodontal pocket deeper than 4mm. However, only 83 teeth had a periodontal pocket deeper than 4mm (Fig. 1).

It was revealed that 75 patients out of a total of 121 examined patients were involved in oral pigmentation (Table 3). Although the prevalence of oral pigmentation in male patients seemed to be somewhat higher than that in female patients, no definitive difference between sexes was observed. A chronological examination showed that the prevalence of oral pigmentation in the patients of middle age was higher than that in patients above the ages

<p>| Table 1 Distribution of the teeth with periodontal pockets deeper than 3 mm by age group |
|---------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|</p>
<table>
<thead>
<tr>
<th>Age</th>
<th>PD ≤3 mm</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>&lt;40</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>40~49</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>50~59</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>60~69</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>70~79</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>0</td>
</tr>
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<td>80~89</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>17</td>
<td>4</td>
<td>12</td>
<td>11</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

PD ≥3 mm: periodontal pocket deeper than 3 mm. M: male, F: female. *: number of patients.
Table 2  Prevalence of the teeth with periodontal pockets deeper than 3mm by tooth species

<table>
<thead>
<tr>
<th>Tooth</th>
<th>NTPD</th>
<th>NTET</th>
<th>%</th>
<th>NTPD</th>
<th>NTET</th>
<th>%</th>
<th>NTPD</th>
<th>NTET</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

NTPD: number of the teeth with periodontal pockets deeper than 3 mm. NTET: number of the total examined teeth.

Discussion

The prevalence of teeth with periodontal pockets deeper than 3mm still remained to be high as reported previously. Chronological examination showed that the prevalence of periodontal pockets deeper than 3mm increase in the age dependent fashion but about half of the total examined teeth were involved in periodontal diseases even in the patients below the age of fifty. However, the ratio of teeth with periodontal pockets deeper than 4mm to total examined teeth in 2002 was about 16.8%, indicating destruction of the periodontal tissues was not severe. In general, systemic factors have not been suggested to be a primary cause of periodontal diseases. In Yusho patients too, of course, the plaque accumulation must be the chief cause of the marginal periodontal pocket development. Periodontal pocket depth might become shallow due to adequate tooth brushing and

![Fig. 1 Prevalence of the teeth with periodontal pocked deeper than 3 mm](image)
dental treatment such as tooth scaling and root planing. In this examination, however, it was revealed that persons of advanced age dominate among Yusho patients. As it is generally accepted that older people are more susceptible to bacteria and their by-products, oral care must become important more and more.

This examination showed that 61.9% of the Yusho patients suffered from oral pigmentation and the prevalence of oral pigmentation in male patients seemed to be somewhat higher than that in female patients. In accordance with the gradual decrease of the blood PCB concentration after exposure, it has been reported that the prevalence of both skin pigmentation and conjunctival pigmentation have decreased over the years\(^7\)\(^8\). Similarly, the prevalence of oral pigmentation had decreased until 1994\(^9\). However, it had increased again and reached in the plateau between 1996 and 2002\(^2\)\(^4\)\(^6\). The reasons for this discrepancy still remain unknown. Further research should be needed to reveal the mechanism of the development of oral pigmentation. A chronological examination demonstrated that the Yusho patients below the ages of fifty seemed to have a higher prevalence of oral pigmentation than those above the ages of sixty. The blood total-PCBs concentration in 2001 tended to be higher in the aged patients than that in the young patients. Taking these findings into consideration, we

Table 3 Distribution of the patients with oral pigmentation by age group

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>6*</td>
<td>5</td>
<td>91.7</td>
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<tr>
<td>40～49</td>
<td>3</td>
<td>2</td>
<td>71.4</td>
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<tr>
<td>50～59</td>
<td>11</td>
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<td>60～69</td>
<td>7</td>
<td>12</td>
<td>54.3</td>
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<td>70～79</td>
<td>9</td>
<td>9</td>
<td>51.4</td>
</tr>
<tr>
<td>80～89</td>
<td>1</td>
<td>3</td>
<td>57.1</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>38</td>
<td>61.9</td>
</tr>
</tbody>
</table>

*: number of patients. %: the ratio of patients with oral pigmentation to total patients in each age group.
supposed that PCBs might induce oral pigmentation, also effects of PCBs on oral pigmentation might be rather indirect than direct.

References

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2002年度における油症患者の歯周疾患ならびに
口腔内色素沈着の疫学的調査

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奥村 英彦

油症患者における歯周疾患や口腔内色素沈着の
罹患状況の経年変化を把握するために、平成14年度
の福岡県油症一斎検診を受診した油症認定患者を対象に口腔内診査を行った。
1）深さ3 mm以上の歯周ポケットを1歯でも
有している患者は95名（86.4%）で、また3
mm以上の歯周ポケットを有する歯牙は495
の総被検歯のうち276歯（55.8%）といずれ
も高い割合を示した。
2）121名の油症認定患者のうち75名に口腔内
色素沈着がみられた。部位としては歯肉にみ
られるものがほとんどであった。加齢と共に
色素沈着の発現率は低下しており、加えて色
素沈着の程度も若年者に比べて高齢者の方が
軽微であった。
以上の結果から、油症患者においては辺縁性歯
周炎および口腔内色素沈着の罹患率が依然として
高く、機序については不明だがPCBsやその代謝
産物がこれらの病変の発症や進展に関与している
と考えられる。