Awareness of low back pain among dentists working at two university hospitals

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We investigated it about low back pain for dentists in April, 2011.
The object was 101 dentists working in the hospital attached to the Asahi University school of dentistry and the Asahi University PDI Gifu dental clinic (70 men, woman 31). We added up a questionnaire result and performed cluster analysis.
As for the result, dentists with the experience of the low back pain were 73 people. Many people answered it that there was a cause of the low back pain for everyday life including the lack of exercise. The person with the experience of much low back pain tried for the improvement of the symptom. The dentist suffering from low back pain had many people going for bonesetting and acupuncture moxibustion. As for the person with the experience of the low back pain, low back pain was relieved by being treated. However, as for the person who was not treated, low back pain was not relieved. Many dentists are treated for the low back pain, but it is necessary to receive a definitive diagnosis in orthopedics.

Key words: Low back pain, Questionnaire survey, Cluster analysis

Objective
Dental treatment chairs and other dental practice equipment released in recent years is ergonomically designed to minimize stress on the practitioner’s body\(^5\). Low back pain and other health problems that dentists face are said to be caused by stress from treating patients and a working posture that puts excessive stress on the body\(^5\), and many dentists suffer from low back pain.

In this study, a survey about low back pain was conducted on dentists and their awareness of low back pain as well as their methods for managing it was examined.

Methods
In April 2011, a survey was conducted on 101 dentists working at Asahi University Hospital and Asahi University PDI Dental Clinic at Gifu. The answer choices were sorted into arbitrarily assigned fields and trends relating to low back pain were examined (Fig. 1).

Completed surveys were obtained from 101 respondents (70 men and 31 women). Of these respondents, 29 were in their 20s, 38 were in their 30s, 13 were in their 40s, 16 were in their 50s, and five were in their 60s.

The results were compiled and analyzed with statistical software (SPSS Version 17, USA).

Only those who reported “a history of low back pain” were selected for analysis. “Symptoms other than low back pain,” “intensity of past pain,” “intensity of current pain,” “visited a specialist,” “tried alternative medicine,” “felt pain during work,” and “low back pain caused by work” were converted to variables and cluster analysis was performed.

Ward’s method was used for clustering and squared Euclidean distance was used as the unit of measurement.

Results
Seventy-three (52 men and 21 women) of the 101 respondents reported a history of low back pain (Table 1). Of these, 23 reported leg pain or numbness in addition to low back pain.

Twenty-five reported visiting an orthopedic surgeon (Table 2), whereas 59 reporting using alternative medicine such as chiropractic (Table 3).

More than half of respondents reported low back pain during dental work or during everyday activities (Table 4).

Almost all respondents who reported low back pain believed that the pain was caused by everyday activities. Two believed it was caused by treating dental patients, 35 believed it was caused by everyday activities, and 33 believed it was caused by both (Table 5).

More respondents believed that their low back pain was caused by everyday habits such as their posture or lack of exercise than believed it was caused by treating patients, and almost all respondents who reported low back pain regularly used stretching or massage to relieve low back pain.

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Figure 1: Survey form

Back Pain Questionnaire

This questionnaire concerns the health of health care providers (dentists, doctors, nurses, dental hygienists, etc.) in medical settings as well as consolidating and investigating data that indicates improvements in lifestyle. The results and outcomes obtained from this research may be used at academic conferences or in written reports but your personal information such as name and identity will not be disclosed. We will do our utmost to protect your privacy and civil liberties.

Please check the appropriate box. (optional)

Name ( )

1. Gender □ Male □ Female

2. Age □ 10-19 □ 20-29 □ 30-39 □ 40-49 □ 50-59 □ 60 or over

3. □ Dentist □ Dental Hygienist □ Dental Assistant □ Medical Intern □ Other

What is your specialist field? ( )

No. of years of experience: years
4. Have you ever experienced back pain?
☐ Yes ☐ No

If you answered Yes to Question 4, please also answer the following.

5. What symptoms did you/do you have?
☐ I could not/cannot bend forwards
☐ I could not/cannot bend backwards
☐ I could not/cannot bend either forwards or backwards
☐ I am/was not restricted when bending either forwards or backwards

Did you/do you have any other symptoms apart from pain in your back?
☐ Yes ☐ No

If you answered Yes, what kind of symptoms?
(multiple responses possible)
☐ Leg pain
☐ Gluteal pain
☐ Numbness in the legs
☐ Paralysis in the legs (little/no strength in the legs)
☐ Other

( )
How bad was/is your back pain?

Evaluate previous pain on a scale of 1 – 5:
- moderate □ 1 □ 2 □ 3 □ 4 □ 5 severe

Evaluate current pain on a scale of 1 – 5: moderate
- □ 1 □ 2 □ 3 □ 4 □ 5 severe
- □ I could not move at all and had to stay in bed (or I was hospitalized)
- □ The pain was a hindrance in my everyday life (work) and I could not work
- □ The pain is a hindrance in my everyday life (work) but I can work
- □ I am able to tolerate it and continue with my everyday life but I am in pain
- □ I am in a little pain
- □ I am not in pain but I am uncomfortable
- □ I am slightly uncomfortable
- □ It does not bother me much
- □ It doesn’t bother me at all

6. Have you seen a specialist (orthopaedics) about your back pain?
- □ Yes □ No

If you answered Yes, what was the diagnosis?
( )
7. What treatment were you given?

- Corset
- Anti-inflammatory plasters
- Block injection
- Intramuscular injection
- Painkillers, etc.
- Rehabilitation (physiotherapy)
- Surgery ( )
- Other ( )

8. Have you tried any alternative treatments for your back pain? (multiple responses possible)

- Manual therapeutics
- Acupuncture
- Chiropractic
- Shiatsu massage (Anma massage/ordinary Shiatsu massage)
- Orthopedic/Osteopathic
- Qigong breathing exercises
- Other alternative treatments ( )
- I have not tried any alternative treatments
9. When do you feel back pain? (multiple answers possible)

- When I am working in general (at the dental chair)
- When I am operating
- When I am assisting during an operation
- When I am working at my desk
- When I am driving for long periods of time
- When I lift heavy objects
- When I have to stand for long periods
- When I am doing heavy labour
- When I am watching TV
- When I am standing on the bus or train
- When I lift up my children
- When I am walking
- When I have my period
- When the weather is bad
- When I exercise vigorously
- After work
- When I get up from being seated in a chair or car
- I am always in pain
- When changing the posture of patients
- I can’t sleep due to severe pain
- After running
- When I get up in the morning
When I turn over in bed

Other ( )

10. What do you think causes your back pain? (multiple responses possible)

- Bad posture
- Lack of exercise
- Continued use of the same posture
- Ageing
- Intemperate
- Obesity
- The nature of my job
- Orthopaedic illness
- Internal illness
- Gynaecological illness
- Urological illness
- Pregnancy
- Unnatural postures
- I put pressure on my back when moving patients
- My work involves hard physical labour
- Accident
- I train hard when I play sport
- I don’t know
- Other ( )
11. What are you doing to relieve your back pain? (multiple answers possible)

- I do exercises and sport
- I have massages
- I stretch
- I rest
- I take baths
- I heat the affected area
- I apply pressure to my pressure points
- I apply external anti-inflammatory agents (gel/plaster, etc.)
- I take anti-inflammatory agents orally
- I wear a corset
- I regularly use alternative therapy such as Manual therapeutics
- I regularly visit an orthopaedic clinic
- I am waiting for it to heal naturally
- I can’t do anything because it hurts so much
- Other ( )

Thank you for your cooperation.
Figure 1: Survey form (Japanese language)

腰痛アンケート

本アンケートは，医療従事者（歯科医師，医師，看護師，歯科衛生士など）の医療現場での健康に関する調査を行うと共に，生活改善の指標になるデータを集約し検討を行う。この研究を通じて得られた結果や成果が，学会や文献の発表に使用されることがありますが，あなたの名前や身元などがあきらかになることは絶対にありません。プライバシーや人権の保護に最大限配慮いたします。□に「○」をいてください。

（任意）氏名（）

1. 性別は？ □ 男性 □ 女性

2. 年齢は？ □ 10代 □ 20代 □ 30代
□ 40代 □ 50代 □ 60代以上

3. 職業は？ □ 歯科医師 □ 歯科衛生士
□ 歯科助手 □ 研修医 □ その他
専門分野は？（）

経験年数 年
4. 腰痛になったことがありますか？
□ ある　□ ない
あると回答された方に伺います
5. そのときの症状について伺います
□ 前屈ができなかった（できない）
□ 反ることができなかった（できない）
□ 前屈も、反こともできなかった（できない）
□ 前屈も、反ることも制限はなかった
腰部の痛み以外の症状がありましたか？
□ ある　□ ない
あると回答された方へ、それはどんな症状でしたか（複数回答可）
□ 下肢痛　□ 臀部の痛み　□ 下肢のしびれ
□ 下肢の運動麻痺（力が入りにくい／入らない）
□ その他（　）
腰痛の程度はどの程度でしたか？
痛みは5段階でどれくらいでしたか？
軽い  1 □  2 □  3 □  4 □  5 □  重い
現在の痛みの5段階でどれくらい？
軽い  1 □  2 □  3 □  4 □  5 □  重い
□ 全く動けなくずっと寝ていた（または入院した）
□ 日常生活（診療）に支障をきたす程度苦痛で診療不能
□ 日常生活（診療）に支障をきたす程度苦痛であるが診療可
□ 何とか我慢できるがかなり苦痛である
□ 少し苦痛である
□ 苦痛ではないが不快である
□ すこし不快である
□ あまり気にならない
□ 全く気にならない
6. 腰痛で専門医（整形外科）の診断を受けてることがありますか？
□ ある  □ ない
あると回答された方
診断名は？（  ）

7. 整形外科での治療は？
□ コルセット  □ 湿布  □ ブロック注射
□ 筋肉注射  □ 鎮痛剤など
□ リハビリ（理学療法）
□ 手術（  ）
□ その他（  ）

8. 腰痛治療で試したり通院したことがあります民間療法は？（複数回答可）
□ 整体  □ 鍼灸  □ カイロプラクティック
□ 指圧（按摩・マッサージ）
□ 接骨・整骨  □ 気功
□ その他民間療法（  ）
□ 民間療法を試したことがない
9. 腰痛を感じるのはどんな時ですか？(複数回答可)

□ 一般診療時（デンタルチェアーで）
□ 手術執刀時 □ 手術助手時
□ デスクワークをしている時
□ 長時間車の運転をしている時
□ 重い物を持ち上げた時
□ 立ちっぱなしで作業をしている時
□ 重労働をしている時
□ テレビを見ている時
□ バスや電車で立っている時
□ 子供を抱っこやおんぶをしていている時
□ 歩いている時 □ 月経時 □ 天気が悪い時
□ 激しい運動をした時 □ 仕事の後
□ 椅子や車の座席座っていて立ち上がったとき
□ 常に痛み
□ 患者さんの体位交換
□ 睡眠時に激痛で眠れない □ 走った後
□ 朝の起床時 □ 寝返り時
□ その他（ ）
10. 自分の腰痛の原因は何だと思いますか？（複数回答可）
□ 悪い姿勢 □ 運動不足 □ 同じ姿勢の継続
□ 老化 □ 不摂生 □ 肥満 □ 職業柄
□ 整形外科的な疾病 □ 内科的な疾病
□ 婦人科的な疾病 □ 泌尿器科的な疾病
□ 妊娠中 □ 無理な体勢
□ 患者さんを動かしているため腰に負担がかかる
□ 仕事が肉体労働でハード □ 事故
□ スポーツ活動がハード □ わからない
□ その他（　）

11. 腰痛解消のために何かしていますか？（複数回答可）
□ 体操やスポーツをしている
□ マッサージをする □ ストレッチをする
□ 安静にする □ 入浴する □ 暖める
□ ツボを押す □ 外用消炎鎮痛剤を塗る・貼る
□ 消炎鎮痛剤を内服する □ コルセットを着用
□ 整体などの民間療法に通う
□ 整形外科に通う □ 自然治癒を待つ
□ 痛くてなにもできない
□ その他（　）

ご協力ありがとうございました。
Table 1 Classification of respondents’ history of low back pain by age group and sex

<table>
<thead>
<tr>
<th>Age group</th>
<th>20s</th>
<th>30s</th>
<th>40s</th>
<th>50s</th>
<th>60s</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>8</td>
<td>25</td>
<td>7</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Women</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>No history</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Men</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 Number of respondents who visited an orthopedic surgeon

<table>
<thead>
<tr>
<th>Visited</th>
<th>20s</th>
<th>30s</th>
<th>40s</th>
<th>50s</th>
<th>60s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visited</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Did not visit</td>
<td>14</td>
<td>22</td>
<td>8</td>
<td>8</td>
<td>2</td>
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</tbody>
</table>

Table 3 Respondence experience of alternative medicine

<table>
<thead>
<tr>
<th>Set tai (manual)</th>
<th>20s</th>
<th>30s</th>
<th>40s</th>
<th>50s</th>
<th>60s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chiropractic</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Acupressure</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Sekkotsu (bonesetting)</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Qigong</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Did not try</td>
<td>4</td>
<td>9</td>
<td>5</td>
<td>6</td>
<td>4</td>
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</table>

Table 4 Situation where pain occurs by sex and age group

<table>
<thead>
<tr>
<th>Treating patients</th>
<th>Men</th>
<th>Women</th>
<th>20s</th>
<th>30s</th>
<th>40s</th>
<th>50s</th>
<th>60s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desk work</td>
<td>20</td>
<td>12</td>
<td>8</td>
<td>11</td>
<td>7</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>During work</td>
<td>27</td>
<td>10</td>
<td>10</td>
<td>14</td>
<td>4</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Everyday activities</td>
<td>18</td>
<td>8</td>
<td>7</td>
<td>12</td>
<td>3</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Constitution</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>0</td>
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<tr>
<td>Sports</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Always hurts</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
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<td>1</td>
<td>1</td>
<td>1</td>
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<td>0</td>
</tr>
</tbody>
</table>

Table 5 Causes of low back pain by sex and age group

<table>
<thead>
<tr>
<th>Everyday activities</th>
<th>Men</th>
<th>Women</th>
<th>20s</th>
<th>30s</th>
<th>40s</th>
<th>50s</th>
<th>60s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treat ing patients</td>
<td>23</td>
<td>12</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td></td>
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<tr>
<td>Pregnancy</td>
<td>5</td>
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<td>2</td>
<td>0</td>
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<tr>
<td>Accident</td>
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<tr>
<td>Sports</td>
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<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
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<tr>
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<td>1</td>
<td>1</td>
<td>0</td>
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<td></td>
</tr>
<tr>
<td>Other</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 Cluster analysis by sex and age group

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Moderate group</th>
<th>Severe group</th>
<th>Warning group</th>
<th>Caution group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>20s</td>
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<td>2</td>
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</tr>
</tbody>
</table>

Figure 2 Dendrogram

In the cluster analysis, the data were divided into the following four clusters: moderate group, severe group, warning group, and caution group (Fig. 2). Neither sex and age trends nor differences in the severity or degree of improvement had a notable effect on the structure of the clusters (Table 6).

The respondents who received treatment after experiencing low back pain included the moderate group of 22 respondents who reported only using alternative medicine such as chiropractic and the severe group of 20 respondents who had tried alternative medicine after seeing a specialist such as an orthopedic surgeon. Almost no respondents chose specialist consultation and treatment...
alone.

Both the warning group of 11 respondents who had serious symptoms but were not receiving treatment and the caution group of 20 respondents who had mild symptoms but never received treatment had neither visited an orthopedic surgeon nor tried alternative medicine and their symptoms had not improved.

Results for each cluster were compared by sex and age group.

For women, there was not a large difference between the number reporting mild symptoms and the number reporting moderate to severe symptoms. Women were also more likely than men to have received treatment after experiencing low back pain.

By age group, the number of respondents in their 20s and 30s reporting mild symptoms was nearly equal to the number reporting moderate to severe symptoms, but almost all respondents in their 40s and older had moderate to severe symptoms (Table 7, 8).

Almost all dentists who reported low back pain experienced it during everyday activities and used exercise or massage to relieve the pain.

### Table 7 Intensity of past and current pain by age group

<table>
<thead>
<tr>
<th></th>
<th>20s</th>
<th>30s</th>
<th>40s</th>
<th>50s</th>
<th>60s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
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### Table 8 Intensity of past and current pain by cluster

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<th>Warning group</th>
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<tbody>
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<td></td>
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</tr>
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</tr>
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<td>5 (Severe)</td>
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<td>9</td>
<td>3</td>
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</tbody>
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<table>
<thead>
<tr>
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<th>Severe group</th>
<th>Warning group</th>
<th>Caution group</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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<tr>
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<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 9 Situation where pain occurs (by cluster)

<table>
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<th>Warning group</th>
<th>Caution group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treating patients</td>
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<td>9</td>
<td>4</td>
<td>11</td>
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<tr>
<td>Desk work</td>
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<td>13</td>
<td>5</td>
<td>7</td>
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<tr>
<td>During work</td>
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<td>10</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Everyday activities</td>
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<td>7</td>
<td>7</td>
<td>3</td>
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<tr>
<td>Constitution</td>
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<td>5</td>
</tr>
<tr>
<td>Sports</td>
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<td>2</td>
</tr>
<tr>
<td>Always hurts</td>
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<tr>
<td>Other</td>
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</table>

### Table 10 Cause of low back pain (by cluster)

<table>
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<th>Warning group</th>
<th>Caution group</th>
</tr>
</thead>
<tbody>
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<td>Everyday activities</td>
<td>21</td>
<td>19</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Treating patients</td>
<td>11</td>
<td>14</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Pregnancy/illness</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Accident</td>
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<td>Sports</td>
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<td>1</td>
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<tr>
<td>Other</td>
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</table>

Discussion

The prevalence of low back pain among dentists in this study was found to be 72.2% (73 of 101 respondents), which is consistent with the rate of 70% that can be seen for some facilities in studies by other medical institutions. Similar results have been observed for many assisted living facilities.

Low back pain is just one occupational health issue that affects dentists; there are also others such as cervicobrachial disorder. Dental examinations were once performed in an upright position, but this method has recently been replaced with the patient sitting in an almost horizontal position in order to reduce low back pain. New treatment devices based on ergonomics that avoid putting excessive stress on the dentist while he or she is treating patients have been and are still being developed to prevent and reduce low back pain, but have not yet eliminated low back pain completely.

Studies have long examined what posture does not put stress on dentists’ bodies when they are treating patients.
Many dentists have their own unique posture, but improper posture puts stress on the spine and can lead to scoliosis and other skeletal conditions. Dentists are not the only professionals for whom low back pain is an occupational health issue; it is also a problem for care workers and nurses, and thus equipment and techniques have been developed to reduce stress on the body.

The cause of the pain is unique to each profession. A variety of everyday activities can put a person at risk for low back pain. McKenzie proposes that spending a long time in a seated position with the body bending forward causes low back pain, while Cailliet proposes that the cause is a standing position that intensifies lumbar flexion. Ono proposes that low back pain develops due to loss of overall muscle strength that occurs when a person exercises less and particularly when they walk less. He also adds that Japanese-style toilets substantially strengthen the hips and legs, and that leg strength naturally declines when the number of Western-style toilets increases.

Conclusion

Although it was found that more than 70% of dentists had a history of low back pain, not many dentists complained of low back pain while treating patients due to advancements in dental treatment equipment. Dentists are highly aware of low back pain and perform maintenance, but results indicated a need for dentists to be informed of the importance of seeing an orthopedic surgeon to identify the cause of the pain, as well as a need for treatment and maintenance for low back pain.

References


大学附属病院勤務歯科医師の腰痛に関する意識調査

福井 達真1  田中 昌秀1  浦田 裕介2  横矢 隆二2
関根 榊太2  青芝 秀幸3  大森 俊和3  河野 哲2
塚原 隆司3  藤原 周1  山内 六男3  大友 克之3

我々は歯科医師を対象に腰痛に関する調査を2011年4月に行った。朝日大学大学部附属病院および朝日大学PDI 岐阜歯科診療所に勤務する歯科医師101人（男性70名、女性31名）に対して腰痛に関するアンケート調査を行った。アンケート結果を集計し、クラスター分析を行った。腰痛の経験のある歯科医師が73名だった。運動不足など日常生活が腰痛の原因と答えた人が多かった。多くの腰痛の経験のある人は症状の改善に努めていた。腰痛にかかっている歯科医師は接骨院や鍼灸に行く人が多かった。腰痛の経験のある人は治療を受けることにより腰痛が緩和した。しかし治療を受けなかった人は腰痛が緩和しなかった。多くの歯科医師は腰痛の治療を受けているが、整形外科で確定診断を受ける必要がある。

キーワード：腰痛、アンケート調査、クラスター分析

1口腔機能修学講座歯科補綴学分野
2口腔機能修学講座歯科保存学分野
3総合医学講座整形外科分野

Awareness of low back pain among dentists working at two university hospitals

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（平成26年9月22日受理）