Quality of Life in Korean Patients with Burning Mouth Syndrome

Ju-Hyun Park, D.D.S., M.S.D., Jeong-Seung Kwon, D.D.S., M.S.D., Ph.D.,
Jong-Hoon Choi, D.D.S., M.S.D., Ph.D., Hyung-joon Ahn, D.D.S., M.S.D., Ph.D.

Department of Oral Medicine, College of Dentistry, Yonsei University, Seoul, South Korea

The purpose of this study was to evaluate the individually perceived quality of life in Korean patients with BMS using two questionnaires: the Medical Outcome Short Form Health Survey Questionnaire (SF-36) and the Oral Health Impact Profile (OHIP-49).

This cross-sectional study included sixty subjects diagnosed with BMS and sixty healthy subjects as controls. All subjects in this study completed two questionnaires: the Medical Outcome Short Form Health Survey Questionnaire (SF-36) and the Oral Health Impact Profile (OHIP-49), which had been translated into Korean and subsequently validated for use in Korea.

All of the subscales in the SF-36 exhibited significantly lower scores in BMS patients than control groups. Comparison of the mean SF-36 scores between the two groups revealed the greatest differences to be for the subscales of physical pain and role emotional (role limitations due to emotional problems).

The mean score on each subscale of the OHIP-49 was significantly higher in BMS patients than control groups. Comparison of the mean OHIP-49 scores between the two groups revealed the greatest difference to be for the subscale of physical pain.

These findings demonstrated that BMS had an impact on various components of a patient's quality of life. BMS patients exhibited more impaired results and a poorer quality of life than control groups.

Key words: Burning mouth syndrome, Quality of life, SF-36, OHIP-49

I. INTRODUCTION

Burning mouth syndrome (BMS) is defined by the International Association for the Study of Pain as burning pain in the tongue or other oral mucous membrane that is associated with normal signs and laboratory findings and lasts at least 4–6 months. This condition (ICHD-II:13.18.5) is described by the International Classification of Headache Disorders II (ICHD-II) of the International Headache Society as an intracranial burning sensation for which no medical or dental cause can be found.

There are as yet no definitive criteria for diagnosing BMS, and because various criteria are
used in diagnosis, its prevalence ranges from 0.6% to 15%\(^2\). In 1989, the National Health Interview conducted a questionnaire survey of 45,711 members of the US civilian population. The prevalence of BMS at that time among the entire cohort was 0.7%; of these, 0.8% of female subjects and 0.6% of male subjects\(^3\). BMS occurs more frequently among women, especially during middle and old age\(^4\).

The major complaints of BMS patients may be described as burning, tender, tingling, hot, scalding, and numb sensations of the oral mucosa. These symptoms are usually experienced bilaterally and are persistent, but do not disturb sleep. The pain most frequently affects the anterior two thirds of the tongue, followed by the dorsum and lateral borders, the anterior aspect of the hard palate, and the labial mucosa of the lips\(^5\). Patients who have BMS have more nonspecific physical problems and/or other psychogenic-related complaints than healthy controls, such as dry mouth, bad or altered taste, thirst, headaches, tenderness or pain in the neck, shoulder, and masticatory muscles, anxiety, depression, and personality disorders. However, it is unclear whether these symptoms are risk factors for the development of BMS or a consequence of the syndrome\(^6\).

The underlying etiology of BMS has yet to be identified. It appears to be complex and multifactorial, involving interactions between local factors such as dentures, candidiasis, and parafunctional oral habits, and systemic factors such as various types of nutritional and hormonal deficiencies. The chronic pain experienced in conditions such as BMS is closely related to psychological factors like depression, anxiety, and somatic reactions to stress\(^7\).

Furthermore, it has recently been suggested that life components such as stressful events, functioning, and well-being play a role in chronic oral disorders and are etiologic factors\(^8\).

Quality of life takes into account factors such as health, work, economic status, leisure activities, environment, and social relationships\(^9\). As stated above, various general, psychosocial, and psychological well-being factors may be associated with symptoms in BMS patients. In this context, health-related quality of life (HRQoL) is particularly important for evaluating chronic oral disorders like BMS. Lopez-Jornet et al. studied HRQoL in BMS patients using two questionnaires, the Medical Outcome Short Form Health Survey Questionnaire (SF-36) for evaluating self-perceived general health status and the Oral Health Impact Profile (OHIP-49), which assesses the self-rated oral health and oral HRQoL\(^10\). Meanwhile, Strmbeck et al. studied the HRQoL in primary Sjogren's syndrome, rheumatoid arthritis, and fibromyalgia using the SF-36 in Sweden, and McMillan et al. studied the impact of Sjogren's syndrome on oral HRQoL using the SF-36 and the OHIP-49 in a southern Chinese population\(^11,12\). According to these studies, it is possible to compare the quality of life in patients and healthy people. However, the quality of life in Korean BMS patients has not been studied yet.

The purpose of this study was to evaluate the individually perceived quality of life in Korean patients with BMS, a typical chronic oral disorder, using two questionnaires that were designed to assess quality of life: the validated Korean version of the SF-36 questionnaire and the validated Korean version of the OHIP-49.

II. MATERIALS AND METHODS

1. Subjects

Sixty subjects of both genders (female = 57, male = 3) diagnosed with BMS were enrolled in this study. All subjects were registered voluntarily at the Department of Oral Medicine of the Dental Hospital of Yonsei University. According to the ICHD-II of the International Headache Society, the diagnostic criteria for BMS states that patients have normal appearance of the oral mucosa, pain in the mouth that is present daily, persists for most of the day, and lasts at least 4 months, and are without local and systemic disease. Subjects who
had taken medications that can cause an oral burning sensation (e.g., angiotensin-converting enzyme inhibitors) and had organic causes of this symptom (candidiasis, dermatoses such as lichen planus, hormonal problems such as diabetes and hypothyroidism) were excluded for this study. All patients underwent a comprehensive clinical examination of the oral cavity and dental status, and radiographic examination to exclude organic findings. Sixty healthy subjects of both genders (female = 52, male = 8) or who had not sought any medical treatment were enrolled as a control group.

2. Methods

1) Medical Outcome Short Form Health Survey Questionnaire (SF-36)

At the first visit, the subjects from both groups completed the Korean version of the SF-36, which had been translated and subsequently validated. The SF-36 was originally designed to survey subjective health status in the Medical Outcomes Study and was specifically designed for clinical practice, research, health policy evaluations, and general population surveys. The SF-36 includes eight multi-item variables: physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, general mental health (psychological distress and psychological well-being), vitality, physical pain, and general perception of health. There is also an additional unscaled single item on changes in health over the previous year. Each item is coded, summed using the Likert method of summated ratings, and transformed to a scale from 0 to 100, whereby a higher score indicates a better subjective health status (Table 1).

2) Oral Health Impact Profile (OHIP-49)

At the first visit, OHIP-49 was carried out with SF-36 to subjects in both groups. The Korean version of the English-language OHIP with 49 items was constructed originally by Slade and Spencer, and was translated and validated for use in a Korean population. Each question in the questionnaire was related to how frequently each event was experienced during the past 3 months. The items were arranged in the form of seven subscales, as follows: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The subjects were required to answer in the form of a five-point Likert scale, whereby 0 = 'never', 1 = 'hardly ever', 2 = 'occasionally', 3 = 'fairly

<table>
<thead>
<tr>
<th>SF-36 subscales</th>
<th>Number of Items</th>
<th>Item Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical functioning</td>
<td>10</td>
<td>3, 4, 5, 6, 7, 8, 9, 10, 11, 12</td>
</tr>
<tr>
<td>Role physical*</td>
<td>4</td>
<td>13, 14, 15, 16</td>
</tr>
<tr>
<td>Physical pain</td>
<td>2</td>
<td>21, 22</td>
</tr>
<tr>
<td>General health</td>
<td>5</td>
<td>1, 3, 3, 4, 5, 36</td>
</tr>
<tr>
<td>Vitality</td>
<td>4</td>
<td>23, 27, 29, 31</td>
</tr>
<tr>
<td>Social functioning</td>
<td>2</td>
<td>20, 32</td>
</tr>
<tr>
<td>Role emotional**</td>
<td>3</td>
<td>17, 18, 19</td>
</tr>
<tr>
<td>Mental health</td>
<td>5</td>
<td>24, 25, 26, 28, 30</td>
</tr>
</tbody>
</table>

* Role physical: role limitations due to physical problems
** Role emotional: role limitations due to emotional problems
often', and 4='very often'. By summing the scores of the responses to the 49 items and items corresponding to the subscales, the OHIP-49 and the OHIP subscale scores were calculated. The overall OHIP score ranged from 0 to 196, a higher score indicating a poorer state of health. (Table 2)

Table 2. Conceptual subscales and items of OHIP-49

<table>
<thead>
<tr>
<th>Subscales and items</th>
<th>Subscales and items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional limitation</strong></td>
<td>Q25. Others misunderstood</td>
</tr>
<tr>
<td>Q1. Difficulty chewing</td>
<td>Q26. Less flavor in food</td>
</tr>
<tr>
<td>Q2. Trouble pronouncing words</td>
<td>Q27. Unable to brush teeth</td>
</tr>
<tr>
<td>Q3. Noticed tooth that doesn’t look right</td>
<td>Q28. Avoid eating</td>
</tr>
<tr>
<td>Q4. Appearance affected</td>
<td>Q29. Diet unsatisfactory</td>
</tr>
<tr>
<td>Q5. Breath stale</td>
<td>Q30. Unable to eat (dentures)</td>
</tr>
<tr>
<td>Q6. Taste worse</td>
<td>Q31. Avoid smiling</td>
</tr>
<tr>
<td>Q7. Food catching</td>
<td>Q32. Interrupts meals</td>
</tr>
<tr>
<td>Q8. Digestion worse</td>
<td>Q33. Sleep interrupted</td>
</tr>
<tr>
<td>Q9. Dentures not fitting</td>
<td>Q34. Upset</td>
</tr>
<tr>
<td><strong>Physical pain</strong></td>
<td>Q35. Difficult to relax</td>
</tr>
<tr>
<td>Q10. Painful aching</td>
<td>Q36. Depressed</td>
</tr>
<tr>
<td>Q11. Sore jaw</td>
<td>Q37. Concentration affected</td>
</tr>
<tr>
<td>Q12. Headaches</td>
<td>Q38. Been embarrassed</td>
</tr>
<tr>
<td>Q13. Sensitive teeth</td>
<td>Q39. Avoid going out</td>
</tr>
<tr>
<td>Q14. Toothache</td>
<td>Q40. Less tolerant to family members</td>
</tr>
<tr>
<td>Q15. Painful gums</td>
<td>Q41. Trouble getting on with others</td>
</tr>
<tr>
<td>Q16. Uncomfortable to eat</td>
<td>Q42. Irritable with others</td>
</tr>
<tr>
<td>Q17. Sore spot</td>
<td>Q43. Difficulty doing job</td>
</tr>
<tr>
<td>Q18. Discomfort (dentures)</td>
<td>Q44. Health worsened</td>
</tr>
<tr>
<td><strong>Psychological discomfort</strong></td>
<td>Q45. Financial loss</td>
</tr>
<tr>
<td>Q19. Worried</td>
<td>Q46. Unable to enjoy people’s company</td>
</tr>
<tr>
<td>Q20. Self-conscious</td>
<td>Q47. Life unsatisfying</td>
</tr>
<tr>
<td>Q21. Miserable</td>
<td>Q48. Unable to function</td>
</tr>
<tr>
<td>Q22. Appearance unsatisfied</td>
<td>Q49. Unable to work</td>
</tr>
<tr>
<td>Q23. Tense</td>
<td></td>
</tr>
</tbody>
</table>
3) Statistical analysis

Statistical analyses were performed to compare the SF-36 and OHIP-49 scores between the BMS and control group. The Kolmogorov-Smirnov normality test was applied to check the normality of distribution. Groups were compared using the two sample t-test. SPSS Version 12.0 statistical package (SPSS® Inc., Chicago, IL, USA) was used for all statistical analyses. Statistical significance was established at 95%.

### Table 3. Demographic characteristics in BMS and control group

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>BMS group (n=60)</th>
<th>Control group (n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>21 - 30</td>
<td>2</td>
<td>3.33</td>
</tr>
<tr>
<td>31 - 40</td>
<td>1</td>
<td>1.67</td>
</tr>
<tr>
<td>41 - 50</td>
<td>8</td>
<td>13.33</td>
</tr>
<tr>
<td>51 - 60</td>
<td>15</td>
<td>25.00</td>
</tr>
<tr>
<td>61 - 70</td>
<td>22</td>
<td>36.67</td>
</tr>
<tr>
<td>71 -</td>
<td>12</td>
<td>20.00</td>
</tr>
<tr>
<td>Mean</td>
<td>60.25 ± 11.86</td>
<td>52.65 ± 10.30</td>
</tr>
</tbody>
</table>

III. RESULTS

1. Subject demographics

The demographic data of the BMS and control group are shown in Table 3. The study included 120 subjects. Of the 60 BMS patients, 57 (95%) were female and 3 (5%) were male, with a mean age of 60.25 (±11.86) years. Of the 60 healthy controls, 52 (86.67%) were female and 8 (13.33%) were male, with a mean age of 52.65 (±10.30) years.(Table 3)

### Table 4. Mean SF-36 scores*

<table>
<thead>
<tr>
<th>SF-36 subscales</th>
<th>BMS group (n = 60)</th>
<th>Control group (n = 60)</th>
<th>P-value**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical functioning</td>
<td>62.78 ± 25.87</td>
<td>88.92 ± 10.42</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Role physical</td>
<td>44.53 ± 35.77</td>
<td>86.67 ± 20.82</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Physical pain</td>
<td>37.10 ± 22.51</td>
<td>83.72 ± 16.48</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>General health</td>
<td>30.48 ± 18.14</td>
<td>68.42 ± 16.04</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Vitality</td>
<td>33.17 ± 19.72</td>
<td>69.48 ± 15.30</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Social functioning</td>
<td>51.25 ± 22.86</td>
<td>87.92 ± 13.80</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Role emotional</td>
<td>49.98 ± 40.49</td>
<td>96.11 ± 12.41</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mental health</td>
<td>38.32 ± 24.09</td>
<td>77.30 ± 14.25</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

* Values are given as mean ± SD.
** Statistically significant at significance level of 95%
Table 5. Mean OHIP-49 scores*  

<table>
<thead>
<tr>
<th>OHIP-49 subscales</th>
<th>BMS group ( (n = 60) )</th>
<th>Control group ( (n = 60) )</th>
<th>P-value**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional limitation</td>
<td>17.67 ± 5.75</td>
<td>5.45 ± 5.57</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Physical pain</td>
<td>20.32 ± 6.28</td>
<td>5.45 ± 5.23</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Psychological discomfort</td>
<td>9.97 ± 3.99</td>
<td>2.63 ± 3.24</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Physical disability</td>
<td>16.03 ± 7.83</td>
<td>2.90 ± 4.01</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Psychological disability</td>
<td>12.87 ± 5.83</td>
<td>3.27 ± 3.93</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Social disability</td>
<td>7.67 ± 4.28</td>
<td>1.42 ± 2.26</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Handicap</td>
<td>10.07 ± 5.00</td>
<td>1.75 ± 2.69</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>all items</td>
<td>94.08 ± 31.16</td>
<td>23.10 ± 22.24</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

* Values are given as mean ± SD.

** Statistically significant at significance level of 95%

Fig. 1. Mean SF-36 scores

Fig. 2. Mean OHIP-49 scores

2. Results for the Medical Outcome Short Form Health Survey Questionnaire (SF-36)

Table 4 presents the SF-36 questionnaire scores for each group. All the SF-36 subscales exhibited significantly lower scores in BMS patients than controls. There were significant differences between BMS group and control group in all of the subscales \( (p < 0.001) \).

Fig. 1 illustrates mean scores of the SF-36 subscales in BMS patients compared with controls. Comparison of the mean SF-36 scores between the two groups revealed the greatest differences to be for the subscales of physical pain and role emotional (role limitations due to emotional problems), and the smallest difference to be for the subscale of physical functioning.

3. Results for the Oral Health Impact Profile (OHIP-49)

Data for the OHIP-49 subscales between the two groups are described in Table 5, which exhibits the significant differences observed between groups in all of the subscales. The BMS group’s scores (94.08 ± 31.16, \( p < 0.001 \)) were significantly higher than the control group (23.10 ± 22.24, \( p < 0.001 \)) in all of the subscales.

Comparison of the mean OHIP-49 scores between the two groups revealed the greatest difference to
be for the subscale of physical pain and the smallest
difference to be for the subscale of social disability.
(Fig. 2).

IV. DISCUSSION

HRQoL refers to the individual's perceived
physical and mental status in their daily life, and is
increasingly being recognized as an applicable and
significant measure of intervention outcomes and
service need in public health research and in practice. A thorough understanding of how a
patient's life is impaired by disease and its
influences on clinical decision making regarding the
various treatment possibilities for a particular
disease have been achieved through various
measures of HRQoL designed to assess the detailed
der picture of chronic disorders in various groups of
patients. However, most traditional HRQoL
questionnaires ignore the perceptions and feelings of
the individual-based assessments and the effect of
the oral status on the psychosocial well-being of
the patient. There is thus a need for measures that
consider patient-perceived multiple outcomes based
on the physical, social, and psychological factors of
oral health that influence quality of life.

Functional scales of quality of life, such as the
SF-36, have been validated for use in the
assessment of numerous chronic oral diseases.
Indeed, the SF-36 has been used to compare the
general state of health in patients. Despite its lack
of sensitivity in relation to oral health status, this
questionnaire is currently accepted as a good
measure of general health status.

The awareness of oral HRQoL has increased, and
its measurement is a commonly accepted method of
specialized assessment of individual-perceived oral
health in dentistry. Since Locker's conceptual
framework for measuring oral health was published,
various methods of measuring oral HRQoL have
been developed. One of the most widely used,
comprehensive and available instruments is the
OHIP-49, which allows a detailed measurement of
the levels of dysfunction, discomfort and disabilities
associated with oral health status. Several possible
benefits of using such instruments have been
described. These include finding out subgroups
within the population that require medical service,
monitoring of risk groups, outcomes of clinical
interventions and targeting of financial resources. At
the present time, these measures have been used
mainly in descriptive population studies, and
predominantly in elderly groups.

In this study, the quality of life of the BMS and
control groups was compared with the aid of two
questionnaires, the SF-36 and the OHIP-49, which
are standardized and widely used. Both have been
translated into Korean and validated for use in
Korea. According to previously published studies,
BMS patients exhibit more impaired results and a
poorer quality of life than control groups. A reduced
quality of life has been demonstrated previously in
Spanish patients with BMS using these two
questionnaires. A poorer HRQoL in Italian BMS
patients was also described by Tabolli et al. The
BMS patients in my study exhibited similar results,
with a relatively poorer quality of life than those
described in the previous studies.

We observed statistically significant differences
between the BMS group and the control group in
all of the subscales. Comparison of the mean SF-36
scores between the two groups revealed the
greatest differences to be for the subscales of
physical pain and role emotional (role limitations
due to emotional problems). In other words, the
BMS patients experienced not only more severe
physical pain, but also problems with work or other
daily activities as a result of emotional problems.
Similarly, comparison of the mean OHIP-49 scores
between the two groups revealed the greatest
difference to be for the subscale of physical pain.
These findings demonstrate that oral diseases such
as BMS have an impact on various components of
a patient's quality of life, and in particular the
physical pain and role-emotional subscales.

There were some limitations to the present study.
First, the cohort was fairly small, which resulted in
difficulty controlling external factors such as the
age and gender distributions. A larger sample is required to elucidate the association between quality of life and BMS. In addition, this is a cross-sectional study that was carried out at a single point of time and without long-term follow-up. Improvements in oral status may result in an improvement in HRQoL; close follow-up is needed to establish this possibility.

The possible etiological factors underlying BMS are many and varied. The multifactorial characteristics of BMS render it important to identify the sources of the symptoms for every BMS patient to enable provision of the most effective treatment. A treatment protocol should include dental and medical aspects, further psychological factors, general health, and life to manage the varying conditions of BMS patients. As stated above, the evaluation of quality of life plays a significant role in the assessment of BMS patients, and so it is important to identify and manage these factors using reliable and validated measurement methods. Depending upon the characteristics identified, extended treatment can be provided to these patients with disturbances of quality of life. Administration of specific and generic quality-of-life questionnaires to patients provides detailed information regarding the complex issues of other chronic oral diseases. Such questionnaires may be useful in clinical practice.

In summary, differences in individual-perceived HRQoL were found between BMS patients and controls. The present study thus confirms the findings of previous studies suggestive that there is a significant association between quality of life and BMS. Therapeutic goals toward reducing the development of disease and the negative impact on quality of life are required, and these may be achieved via the management of physical and emotional aspects. Close cooperation among practitioners is needed to optimize the management of these patients.

REFERENCES

Quality of Life in Korean Patients with Burning Mouth Syndrome


국문요약

한국인을 대상으로 한 구강작열감증후군 환자의 삶의 질 평가

연세대학교 치과대학 구강내과학교실
박주현 · 권정승 · 최종훈 · 안형준

만성 통증의 양상을 보이는 구강작열감증후군은 환자의 신체적, 심리적인 면을 뿐만 아니라 전반적인 삶의 질과의 연관성도 많은 연구들에서 보고되었다. 하지만 현재까지의 대부분의 연구들에서는 구강작열감친환자에게 있어서 손상적인 건강 상태와 관련된 삶의 질을 평가하는 데에는 부족한 면이 있고, 이들의 관계에 대한 연구가 아직은 미흡한 상태이다. 이에 본 연구에서는 구강내과에 내원한 구강작열감증후군 환자를 대상으로 Medical Outcome Short Form Health Survey Questionnaire (SF-36)과 Oral Health Impact Profile (OHIP-49)를 이용한 평가를 시행하였으며, 시행 결과를 대조군의 결과와 비교, 분석하여 삶의 질과의 관계를 분석해 보고자 하였다.

총 60명의 구강작열감증후군 환자 및 60명의 건강한 대조군이 본 연구에 참여하였다. 각 군을 대상으로 전반적인 삶의 질을 평가하기 위해 고안된 설문인 SF-36과 구강 건강과 관련한 삶의 질을 평가하기 위해 고안된 설문인 OHIP-49를 시행하였다. 구강작열감증후군과 전반적인 삶의 질 사이에는 유의한 관계가 관찰되었다. SF-36의 모든 항목에서 구강작열감증후군 환자군은 대조군에 비하여 현저히 낮은 점수를 보이며 전반적인 삶의 질이inferior한 것으로 나타났다. OHIP-49 설문의 결과, 각 항목의 평균에서 구강작열감증후군 환자군은 대조군에 비하여 현저히 높은 점수를 보이며 구강 건강과 관련한 삶의 질이 떨어지는 것으로 나타났다.

주제어: 구강작열감증후군, 삶의 질, 구강건강 관련 삶의 질